Mathematisches
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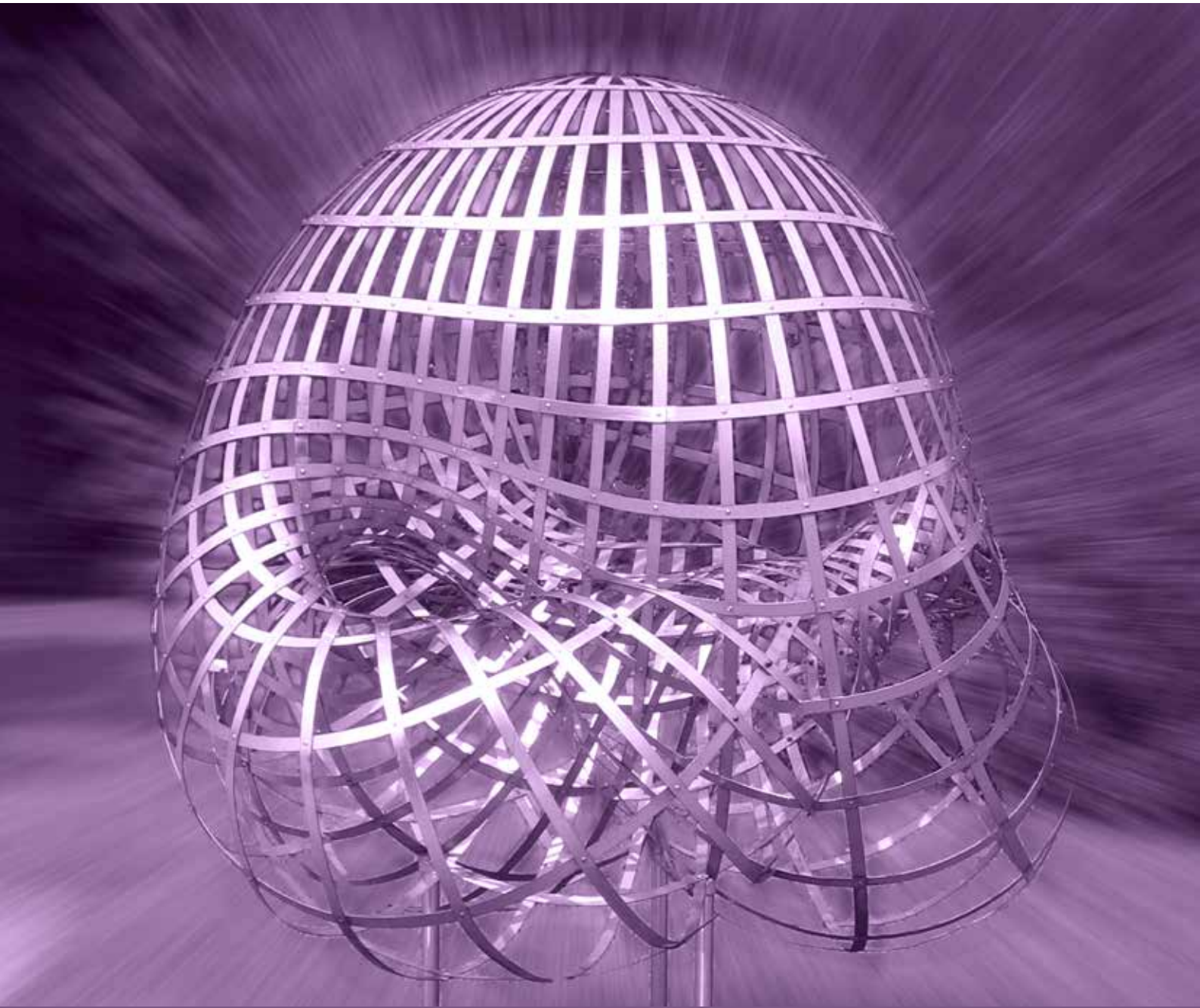
Jahresbericht 2013
Annual Report



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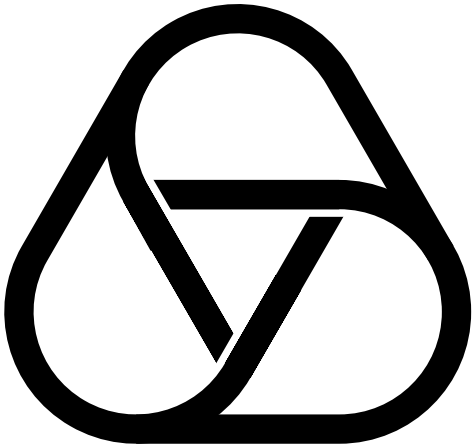

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Das Mathematische Forschungsinstitut Oberwolfach ist Mitglied der Leibniz-Gemeinschaft.

Jahresbericht 2013 – Annual Report 2013

Inhaltsverzeichnis/Table of Contents

Die männliche Form wurde lediglich aus Gründen der Vereinfachung gewählt und dient der besseren Lesbarkeit. Entsprechende Begriffe gelten im Sinne der Gleichbehandlung grundsätzlich für Frauen und Männer.

Gerhard Huisken

Vorwort des Direktors

Im April 2013 hat mein Vorgänger Gert-Martin Greuel die Leitung des Mathematischen Forschungsinstituts Oberwolfach nach 11 überaus erfolgreichen Jahren an mich übergeben. Hochrangige Gäste aus nah und fern machten bei der Amtsübergabe am 5.4.2013 noch einmal deutlich, mit wie viel Kompetenz, Hingabe und Stilsicherheit Gert-Martin Greuel das Institut durch schwierige Zeiten gesteuert und zusammen mit der Gesellschaft für Mathematische Forschung seine wissenschaftliche und materielle Zukunft innerhalb der Leibniz Gemeinschaft gesichert hat, siehe unseren Bericht auf den Seiten 10-12.

Einen besseren Amtsantritt hätte ich mir nicht wünschen können: Mit seinen bewährten wissenschaftlichen Programmen, begleitet von einer hochkarätigen wissenschaftlichen Kommission und in gegenwärtig gesicherten finanziellen Rahmenbedingungen ist das Institut hervorragend aufgestellt, in einer sich ständig verändernden Forschungslandschaft seine besondere Rolle als internationales Zentrum für Austausch und Initiierung neuen mathematischen Wissens zu pflegen und auszubauen. Die vertrauensvolle Zusammenarbeit mit Universitäten und Forschungsinstitutionen weltweit, mit den öffentlichen Geldgebern, den Stiftungen und den vielen anderen Freunden und Unterstützern des Instituts gibt mir die Zuversicht, zusammen mit der Gesellschaft für Mathematische Forschung und zusammen mit unseren Mitarbeiterinnen und

Director's Foreword

In April 2013 I became the successor to Gert-Martin Greuel, who led the Mathematisches Forschungsinstitut Oberwolfach for 11 years with such great success. High ranking guests representing friends, supporters and partners of the MFO took the handover of reigns on 4/5/2013 as an opportunity to recall the competence, dedication and unerring style which by Gert-Martin Greuel used to steer the Institute through difficult times. Jointly with the Gesellschaft für Mathematische Forschung he had been able to secure the Institute's scientific and financial future inside the Leibniz Association, see the report on pages 10-12.

I could not have wished for a better start: Successful scientific programs in place, guided by a high ranking Scientific Committee and in a currently stable financial environment the Institute is well positioned to fulfill and build on its special role as an international center for the exchange of ideas, the communication and initiation of mathematical research. The fruitful and trusting cooperation with universities and research institutions around the world as well as with science foundations, friends and supporters makes me confident that with the help of the Gesellschaft für Mathematische Forschung and the dedicated staff of the MFO it will be possible to maintain the leading scientific position of the Institute in the future. In our efforts it will be especially important to inspire young mathematicians with the friendly and personal research atmosphere

Mitarbeitern die wissenschaftliche Spitzenstellung des Instituts auch in Zukunft behaupten zu können. Ein besonderes Anliegen wird uns dabei sein, die jüngere Generation immer wieder erneut für dieses Institut zu begeistern und durch die Bewahrung und Pflege der traditionellen gastfreundlichen Atmosphäre einen Rahmen zu bieten, in dem enge persönliche Begegnungen unserer Gäste neue Kontakte, Kooperationen und Freundschaften begründen können, die weit über die Wissenschaft hinaus reichen und so einen langfristigen Beitrag leisten zu gegenseitigem internationalen Verständnis.

of the Institute and make them as enthusiastic about Oberwolfach as many mathematicians already are. In this way the MFO should continue to be a place where new contacts, cooperations and friendships can start and grow that make a longterm contribution to international understanding far beyond the science.

Der vorliegende Bericht gibt einen Überblick über die wissenschaftlichen Programme des Instituts, die Drittmittelprojekte und die finanziellen Rahmenbedingungen. Auch über besondere Ereignisse und weitere Fortschritte bei der Sanierung der Gebäude wird berichtet.

The current report gives an overview of the scientific programs at the MFO, its third party projects and the financial background. It also reports on special events and further progress in renovating our buildings.

Das wissenschaftliche Programm am Mathematischen Forschungsinstitut Oberwolfach bestand aus der bewährten Mischung von Workshops, Miniworkshops, Seminaren und Gastaufenthalten, die im Wettbewerb der Anträge von der wissenschaftlichen Kommission begutachtet und festgelegt wurden. In 2013 nahmen fast 3000 Wissenschaftler aus aller Welt während 50 Wochen an den Forschungsprogrammen teil:

The scientific program of the MFO continued as the wellknown successful mixture of Workshops, Mini-Workshops, Seminars and research visits, that have been refereed and decided by the Scientific Committee. In 2013 almost 3000 scientists took part in these programs during 50 weeks of operation:

1. Workshops mit 50-53 Teilnehmern (ca. 40 Wochen)
2. Miniworkshops mit 16-17 Teilnehmern (4 Wochen, je 3 Miniworkshops)
3. Oberwolfach Seminare mit 25 Teilnehmern (3 Wochen, je 2 Seminare)
4. Arbeitsgemeinschaft mit etwa 50 Teilnehmern (2 Wochen)
5. Research in Pairs Programm (RiP) mit je 2-4 Teilnehmern (kontinuierlich)
6. Oberwolfach Leibniz Fellows (OWLF, kontinuierlich)

1. Workshops with 50-53 participants (ca. 40 weeks)
2. Mini-Workshops with 16-17 participants (4 weeks, 3 miniworkshops/week)
3. Oberwolfach Seminars with 25 participants (3 weeks, 2 Seminars/week)
4. Arbeitsgemeinschaft with 50 participants (2 weeks)
5. Research in Pairs program (RiP) with 2-4 participants (continuing)
6. Oberwolfach Leibniz Fellows (OWLF, continuing)

In 2013 wurden auch die ersten Einladungen an „Simons Visiting Professors" ausgesprochen, die ab Januar 2014 von der Simons Foundation (USA) Förderung für einen kombinierten Besuch des MFO und eines anderen Europäischen Instituts erhalten. Zusätzlich veranstaltete das Institut eine Trainingswoche ausgewählter Schüler für die Internationale Mathematik-Olympiade und eine Fortbildung für Bibliothekare. Detaillierte Informationen zu den einzelnen Programmen und Veranstaltungen finden Sie im Innern dieses Jahresberichts.

In 2013 the first invitations were extended for "Simons Visiting Professors", who will be supported starting January 2014 by the Simons Foundation (US) in combinig an overseas visit to Oberwolfach with a research stay at some other European research institution. In addition the Institute hosted a training week for the German team in the International Mathematical Olympiad as well as a training week for librarians, please see the detailed reports below.

Während der Jahresversammlung der Gesellschaft für Mathematische Forschung im Oktober 2013 wurde die öffentliche Oberwolfach Vorlesung diesmal von Professor Ursula Hamenstädt (Bonn) gehalten. Für den Vortrag und für den Abstrakt in diesem Jahresbericht ein herzliches Dankeschön!

The public "Oberwolfach Lecture" during the annual meeting of the Gesellschaft für Mathematische Forschung was held this time by Professor Ursula Hamenstädt (Bonn) – thank you very much for the lecture and the abstract in this report!

Im Baubereich stand 2013 die Errichtung der Gebäude für die neue Holzhackschnitzel-Heizungsanlage im Vordergrund. Sie soll ab 2014 die langfristige Beheizung und Warmwasserversorgung des Instituts auf wirtschaftliche und umweltverträgliche Weise sichern. Die Sanierung der RiP-Appartments konnte abgeschlossen werden, so dass nun alle Gästequartiere auf dem neuesten Stand sind. In den Folgejahren werden Renovierungen im Bibliotheksgebäude und die Fertigstellung der neuen Heizungsanlage im Vordergrund stehen.

Renovations in 2013 concentrated on the construction of buildings for the new heating facility based on woodchips, from 2014 it is supposed to provide most of the heating and hot water services for the institute in an efficient and environmentally friendly way. The renovation of the RiP-apartments could be completed, all guest apartments are now at a modern standard. In the coming years we will complete the new heating system and start renovations in the library building.

Das volle wissenschaftliche Programm und die Fortführung der Baumaßnahmen waren nur möglich in weiterhin gesunden finanziellen Rahmenbedingungen: Dafür gilt dem Bund und den Ländern, insbesondere dem Land Baden-Württemberg, unser Dank, die über die Leibniz-Gemeinschaft den Hauptteil der Haushaltsmittel bereitstellen.

The full scientific program in 2013 was possible only due to continued stable financial conditions. Our thanks go to the federal and state governments, in particular the state of Baden-Württemberg, who provided the bulk of funding through the Leibniz Association.

Neben dem wissenschaftlichen Programm war das Institut wieder in mehreren Drittmittelprojekten und in der Zusammenarbeit mit anderen Institutionen engagiert: Das Projekt „IMAGINARY – open source Plattform für interaktive Mathematik-Vermittlung" wird seit September 2013 im Nachfolgeprojekt „Oberwolfach trifft IMAGINARY" weiter von der Klaus Tschira Stiftung gefördert und von meinem Vorgänger Gert-Martin Greuel begleitet, der unserem Institut so eng verbunden bleibt. Neben der erfolgreichen nationalen und internationalen Öffentlichkeitsarbeit und Mathematikvermittlung in vielen Ausstellungen und auf der Webseite www.imaginary.org sollen die „Schnappschüsse moderner Mathematik aus Oberwolfach" neue Akzente setzen mit Einblicken in die Forschungsinhalte des Instituts für beginnende Studenten, Gymnasiallehrer sowie für an Mathematik interessierte Abiturienten und ihre Eltern. Die Inhalte von „IMAGINARY" standen auch im Museum für Mineralien und Mathematik „MiMa" in Oberwolfach wieder der Region zur Verfügung und wurden von vielen Besuchern und Schulklassen genutzt.

In addition to the scientific programs above the MFO was engaged in several third party projects and collaborations with other institutions: The project "IMAGINARY-open source platform for interactive mathematics communication" is newly supported since September 2013 by the Klaus-Tschira Foundation under the title "Oberwolfach meets IMAGINARY". My predecessor Gert-Martin Greuel continues to be the scientific advisor and thus remains closely connected to our institute. Building on the successful national and international outreach activities in exhibitions, on the website www.imaginary.org and mathematics communication events, the "Snapshots of modern mathematics from Oberwolfach" will offer new insights into research topics at the Institute in a way that is accessible to beginning students, highschool teachers and their students as well as an interested public. The contents of "IMAGINARY" were also available at the museum for minerals and mathematics "MiMa" in Oberwolfach, where they serve as a hands on access to mathematics for students and visitors for the whole region.

Die von der Deutschen Forschungsgemeinschaft geförderte Einrichtung eines Bibliotheksportals am MFO und der aus Wettbewerbsmittel der Leibnizgemeinschaft finanzierte Aufbau der Datenbank „swMATH – Informationsdienst für mathematische Software" konnten im Jahre 2013

The creation of a library portal at the MFO with support from the German research foundation DFG and the buildup of the data base "swMATH – an information service for mathematical software" were successfully completed in 2013. Highly valuable support for participating

erfolgreich abgeschlossen werden. Wichtige Unterstützung kam wie in den Vorjahren von der Carl Friedrich von Siemens Stiftung für die Teilnehmer der Oberwolfach Seminare und für die Bibliothek. Auch die National Science Foundation der USA hat Nachwuchswissenschaftler bei den Reisekosten wieder wesentlich unterstützt.

graduate students at Oberwolfach seminars as well as support for the library monograph collection came from the Carl-Friedrich von Siemens Stiftung. The National Science Foundation NSF (US) has as in the past generously supported travel expenses of American graduate students.

Ganz wichtig war wie immer die Unterstützung durch die Oberwolfach Stiftung und den Förderverein, die dem Institut neben der finanziellen Hilfe auch weithin sichtbare, wichtige ideelle Rückendeckung bedeutet. Ein herzlicher Dank an alle, die hier gespendet oder sich engagiert haben!

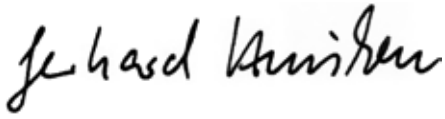
Very important was the support by the Oberwolfach Foundation and the Friends of Oberwolfach – next to the financial support it provided invaluable moral support and backing. A sincere thank you to all who donated or lend their support in other ways!

In meinem ersten Jahr als Direktor konnte ich erleben, wie das Mathematische Forschungsinstitut Oberwolfach ganz wesentlich vom Engagement seiner Mitarbeiterinnen und Mitarbeiter und von der Mitwirkung vieler Mitglieder in seinen Gremien und Kommissionen getragen wird: Der wissenschaftliche Beirat und die wissenschaftliche Kommission garantieren die wissenschaftliche Exzellenz des Instituts durch die Evaluation und Gestaltung des Programms, die Gesellschaft für Mathematische Forschung und der Verwaltungsrat sichern die langfristigen Rahmenbedingungen. Als Tagungsleiter und Teilnehmer sorgen schließlich die Mathematiker zusammen mit unseren Mitarbeitern auch selbst für die besondere Atmosphäre in Oberwolfach, in der wissenschaftlicher und kultureller Austausch zwischen so vielen Besuchern aus aller Welt möglich wird. Ihnen allen gilt unser Dank.

In my first year as director I could experience how the Mathematisches Forschungsinstitut Oberwolfach and its activities are crucially supported and carried by the commitment and efforts of its staff and by the engagement of volunteers for the many scientific and administrative tasks: The Scientific Advisory Board and the Scientific Committee guarantee the scientific excellence of the Institute through the careful evaluation and formation of the scientific program, the Gesellschaft für Mathematische Forschung and the Administrative Council help to secure the longterm funding. Finally organizers and participants of scientific programs themselves create the unique atmosphere in Oberwolfach that allows scientific and cultural exchange between visitors from all over the world.

Wir blicken mit Zuversicht auf die kommenden Aufgaben und hoffen auch im neuen Jahr auf Ihre Unterstützung!

We are looking ahead to new tasks with confidence and hope for your continued support!



Gerhard Huisken

1. Besondere Beiträge

1.1. Amtsübergabe des Direktors

Am Freitagnachmittag, den 5. April 2013, fand eine Festveranstaltung statt, in der der scheidende Direktor Prof. Dr. Gert-Martin Greuel verabschiedet und der neue Direktor Prof. Dr. Gerhard Huisken begrüßt wurde. Nach der Begrüßung der Festversammlung durch den Vorstand der Gesellschaft für mathematische Forschung e.V., Prof. Dr. Willi Jäger, wurden Grußworte gegeben von Ministerialdirektorin Dr. Simone Schwanitz (Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg), Dr. Beatrix Vierkorn-Rudolph (Leiterin Unterabteilung 71 Bundesministerium für Bildung und Forschung, Bonn), Prof. Dr. Karl Ulrich Mayer (Präsident der Leibniz-Gemeinschaft, Berlin), Prof. Dr. Herbert Müther (Prorektor für Forschung, Eberhard Karls Universität Tübingen) und Jürgen Nowak (Bürgermeister der Gemeinde Oberwolfach). Nach einer Pause gab Prof. Dr. Willi Jäger die Präsentation „Looking Back to the Future" und dankte beiden Direktoren, die sich ebenfalls noch an die Festversammlung wandten. Den Festvortrag „Realities of Imaginary" hielt Prof. Dr. Sebastià Xambó (Technical University of Catalonia).

1. Special contributions

1.1. Change of Directorship

On Friday afternoon, 5 April 2013, a ceremony was held in Oberwolfach in which the outgoing director Prof. Dr. Dr. h.c. Gert-Martin Greuel took his farewell and the new director Prof. Dr. Gerhard Huisken was welcomed to the Institute. Guests from the Federal Ministry of Education and Research, the State Department of Science, Research and Art, the Leibniz Society, the University of Tübingen and the municipality of Oberwolfach brought their greetings. After a pause, Prof. Dr. Willi Jäger showed the presentation "Looking Back to the Future" and thanked the two directors. Afterwards Prof. Dr. Gert-Martin Greuel and Prof. Dr. Gerhard Huisken also spoke to the assembly, followed by the keynote lecture "Realities of Imaginary", which was given by Prof. Dr. Sebastià Xambó (Technical University of Catalonia).


LOOKING BACK TO THE FUTURE -
MFO 2002-2013

1.2. Simons Visiting Professors

Im Januar 2014 wird mit Förderung durch die Simons Foundation (https://www.simonsfoundation.org) ein neues Programm in Oberwolfach beginnen, die Simons Visiting Professors (SVP).

Mit diesem Programm können jährlich bis zu 40 Simons Visiting Professors gefördert werden, die als exzellente Wissenschaftler von außerhalb Europas kommend den Besuch eines Oberwolfach Workshops mit einem ca. zweiwöchigen Forschungsaufenthalt an einer europäischen Universität oder Forschungseinrichtung verbinden. Durch das Programm wird der Gastaufenthalt außerhalb des MFO für jeden Simons Visiting Professor mit einem Stipendium von 135 Euro pro Tag unterstützt. Im Gegenzug übernimmt die gastgebende Universität die Unterkunft sowie innereuropäische Reisekosten für die Dauer des Forschungsaufenthalts („Matching Funds").

1.2. Simons Visiting Professors

Starting in January 2014, there will be a new program at Oberwolfach, the Simons Visiting Professors (SVP), funded by the Simons Foundation (https://www.simonsfoundation.org).

This program will annually support up to 40 Simons Visiting Professors, distinguished scientists from outside Europe, who wish to combine an invitation to an Oberwolfach Workshop with a research visit to a European university (or other research institution) of up to two weeks. The program will provide a stipend to each Simons Visiting Professor by Oberwolfach amounting to 135 Euro per day of the university visit. Additionally, the participating university will be required to provide accommodation for the duration of the visit at the university as well as travel expenses within Europe between Oberwolfach and the university as a matching of this support.

Durch diese neue Kooperation zwischen dem MFO und europäischen Universitäten können außereuropäische Wissenschaftler besonders effektiv von der gemeinsamen Förderung profitieren, indem Reisemittel und die Besuche der beteiligten Institutionen sinnvoll kombiniert und aufeinander abgestimmt werden. Durch die Verbindung der Workshopteilnahme mit einem Forschungsaufenthalt werden individuelle Projekte und Vorträge an Europäischen Universitäten über neueste wissenschaftliche Resultate ermöglicht. Dadurch können die in Oberwolfach Workshops präsentierten Ergebnisse einem breiten Publikum von Forschern und Studenten an den teilnehmenden Universitäten zugänglich gemacht werden.

Die Förderung im Rahmen des SVP Programms wird durch den Direktor in Zusammenarbeit mit der Workshopleitung entschieden. Bereits eingeladene Workshopteilnehmer, die an diesem Programm interessiert sind, können die Workshopleitung dazu gerne kontaktieren.

This partnership between the MFO and universities providing matching funds is designed to benefit the scientists, the MFO and participating universities equally by making efficient use of travel funds and travel time in carefully planned combined visits to the MFO and a university. In this way workshop attendance can be combined with individual collaborations and lectures at European universities. The new program will also help to quickly disseminate new research results from Oberwolfach Workshops directly to a wide audience of researchers and students at participating universities.

The SVP awards are decided by the director on suggestion of the organizers of a workshop. Participants of workshops who are interested in this award should contact the organizers of their workshop.

1.3. IMAGINARY 2013

IMAGINARY – open source Plattform für interaktive Mathematikkommunikation

IMAGINARY begann im Jahr der Mathematik 2008 als interaktive Wanderausstellung, die auf attraktive und verständliche Weise Visualisierungen, interaktive Installationen, virtuelle Welten, 3D-Objekte und ihre mathematischen Hintergründe präsentiert. Ab 2011 entwickelte sich die Ausstellung zu einer open source Plattform für interaktive Mathematikvermittlung weiter. Das Projekt lief von September 2011 bis August 2013 und wurde von der Klaus Tschira Stiftung finanziert.

Inzwischen hat sich IMAGINARY weltweit verbreitet und dazu beigetragen, dass der Name Oberwolfach über seinen herausragenden Ruf in der wissenschaftlichen Community hinaus, einer breiteren Öffentlichkeit als Markenzeichen für attraktive und hochwertige Mathematikvermittlung bekannt geworden ist. Andere mathematische Institute beginnen verstärkt ebenfalls im Bereich „Mathematical Outreach" aktiv zu werden, zum Teil in Zusammenarbeit mit IMAGINARY, auch da dies verstärkt von Politik und Wissenschaftsorganisationen verlangt wird.

Im Jahr 2013 wurde die neue Plattform unter der Domain www.imaginary.org zeitgleich mit der Präsentation der Initiative „Mathematik des Planeten Erde" in der UNESCO-Zentrale in Paris, am 5.3.2013, vorgestellt. IMAGINARY und die Plattform wurden in zwei Vorträgen von Gert-Martin Greuel und Andreas Matt präsentiert. Das IMAGINARY-Team mit Christian Stussak, Christoph Knoth, Konrad Renner und Sebastian Uribe präsentierte die Ausstellung vor Ort. Zahlreiche Medien berichteten darüber, u.a. SPIEGEL Online. Am Folgetag verzeichnete die Webseite über eine Million Seitenzugriffe.

Das Ziel der Plattform „IMAGINARY – open mathematics" ist es, einen Ort für die Präsentation und Entwicklung interaktiver Mathematikexponate und -ausstellungen anzubieten. Alle IMAGINARY-Inhalte werden einem breiten Publikum unter einen freien Lizenz zur Verfügung gestellt und können so leicht für eigene Ausstellungen und Veranstaltungen verwendet werden. Darüber hinaus bietet die Plattform allen Benutzerinnen und Benutzern die Möglichkeit, mit eigenen Inhalten beizutragen, und dient so als Basis für den Austausch der sich in den letzten Jahren verstärkt entwickelnden Mathematikvermittlung. Die Zielgruppe der Plattform sind neben Museen und Universitäten auch Schulen. Die Plattform

1.3. IMAGINARY 2013

IMAGINARY – open source platform for interactive mathematics communication

IMAGINARY started in the German year of mathematics 2008 as an interactive travelling exhibition that presents visualizations, interactive installations, virtual worlds, 3D objects and their mathematical background in an attractive and understandable way. Since 2011 it has been developed into an open source platform for interactive math communication. The related project has run from September 2011 until August 2013 and has been supported by the Klaus Tschira Stiftung.

IMAGINARY has been spreading around the world and has contributed to extend the outstanding reputation of Oberwolfach in the scientific community also to a broader public. It has established itself as a trademark for attractive and high quality communication of mathematics. Other mathematical institutes are also starting to be more and more active in mathematical outreach, partly in collaboration with IMAGINARY, and also since it has become a requirement by politics and science organizations.

In 2013 the new platform was presented under the domain www.imaginary.org together with the launch of the initiative "Mathematics of Planet Earth" on March 5th 2013 at the UNESCO headquarters in Paris. IMAGINARY and the platform were introduced in two special talks by Gert-Martin Greuel and Andreas Matt. Christian Stussak, Christoph Knoth, Konrad Renner and Sebastian Uribe from the IMAGINARY team were present. Many media outlets reported about the new platform, among them SPIEGEL Online. As a consequence the web site received more than a million page hits on the following day.

The aim of the platform "IMAGINARY – open mathematics" is to provide a space for the presentation and development of interactive math exhibits and exhibitions. All contents of IMAGINARY are made available to a broad audience under a free licence and can thus be reproduced and used for individual exhibitions and events. Moreover, the platform provides an opportunity for everyone interested to contribute with their own material and serves as a hub for exchange of ideas in the field of math communication, a field that has seen many advances in the last years. The target group of the platform includes museums, universities and schools. The platform was implemented by Christoph Knoth and

wurde von Christoph Knoth und Konrad Renner umgesetzt und von Susanne Schimpf editoriell betreut.

Konrad Renner. Susanne Schimpf took care of the editorial work.

Neben dem Start der Plattform und der Zusammenarbeit mit „Mathematik des Planeten Erde" (siehe nächster Abschnitt) sind 2013 besonders die weitere Zusammenarbeit mit der Deutschen Botschaft in Moskau – mit vier Ausstellungen in Nowosibirsk, Puschtschino, Tomsk and Krasnojarsk – und neue Ausstellungen in Dänemark und Norwegen zu nennen. Die russischen Ausstellungen wurden von Andreas Gebert, einem Mitarbeiter der deutschen Botschaft in Moskau, der ursprünglich aus Oberwolfach stammt, organisiert. Die Ausstellung in Trondheim wurde gemeinsam mit der Norwegischen Akademie der Wissenschaften und dem Abel Preis Komitee veranstaltet. Zum ersten Mal wurden im Jahr 2013 auch Ausstellungen in Indien und Vietnam organisiert.

Besides the launch of the platform and the collaboration with Mathematics of Planet Earth (see next section), the highlights of 2013 were the ongoing collaboration with the German Embassy in Moscow – with four exhibitions in Nowosibirsk, Pushchino, Tomsk and Krasnojarsk – and new exhibitions in Denmark and Norway. The Russian exhibitions were organized by Andreas Gebert from the German Embassy in Moscow, originally from Oberwolfach. The exhibition in Trondheim was jointly organized with the Norwegian Academy of Science and Letters and the Abel Prize Committee. In 2013 and for the first time, exhibitions have also been organized in India and Vietnam.

Eine besondere Anerkennung für IMAGINARY war, dass Gert-Martin Greuel und Andreas Matt für ihre jahrelangen Aktivitäten bei der Entwicklung und Realisierung des Projekts IMAGINARY mit dem „Medienpreis Mathematik 2013" der Deutschen Mathematiker Vereinigung (DMV) ausgezeichnet wurden. Der Preis wird für herausragende Leistungen bei der Vermittlung und Popularisierung von Mathematik vergeben und ist mit 4000 Euro dotiert, zur Verfügung gestellt von der Walter de Gruyter Stiftung in Berlin. Die Preisverleihung fand am 15. November 2013 in Berlin statt.

A very special recognition for IMAGINARY was, that Gert-Martin Greuel and Andreas Matt have been awarded the "Medienpreis Mathematik 2013" by the Deutsche Mathematiker Vereinigung (DMV) for their years of activities in the development and implementation of IMAGINARY. The prize is awarded for outstanding contributions to the communication and popularization of mathematics. The award comes with 4000 Euro prize money provided by the Walter de Gruyter Stiftung in Berlin. The award ceremony took place on November 15, 2013, in Berlin.

Im Dezember 2013 startete die IMAGINARY-Entdeckerbox. Sie beinhaltet eine Sammlung von verschiedenen Ideen, Programmen, Filmen und Bildern, die zum Entdecken und Experimentieren mit Mathematik anregen sollen. Die Entdeckerbox richtet sich speziell an Lehrerinnen und Lehrer, Schülerinnen und Schüler und an alle Mathematik-Interessierten. Die Entdeckerbox kann für die reinen Produktionskosten von 99 Euro inkl. Versand in Deutschland bestellt werden. Alle Inhalte können unter einer offenen Lizenz von www.imaginary.org/entdeckerbox kostenfrei heruntergeladen und weiterkopiert werden.

In December 2013, the IMAGINARY-Entdeckerbox (discovery box) was launched. The box contains a collection of various discovery ideas, software, films, 3D prints and images, with the aim of triggering discovery and experimentation with mathematics. It is designed particularly to appeal teachers and students, or the general public with an interest in mathematics. The Entdeckerbox can be ordered for the cost prize at 99 Euro including shipping in Germany. All digital contents can also be downloaded or copied for free under an open source license, see www.imaginary.org/entdeckerbox.

Zusätzlich zu den permanenten Museumsinstallationen von IMAGINARY-Exponaten im MiMa in Oberwolfach, im Deutschen Museum in München und im National Museum of Mathematics (MoMath) in New York, wurde im Jahr 2013 eine weitere permanente Ausstellung im EXPERIMINTA Science Center in Frankfurt eröffnet.

In addition to the permanent museum installations of IMAGINARY exhibits in the MiMa in Oberwolfach, in the Deutsches Museum in Munich, in the National Museum of Mathematics (MoMath) in New York, a new permanent exhibition was installed in the EXPERIMINTA Science museum in Frankfurt.

Mehr Information zu IMAGINARY finden Sie unter www.imaginary.org.

More information on IMAGINARY can be found at www.imaginary.org.

Mathematik des Planeten Erde (MPE 2013)

Mathematik des Planeten Erde 2013 (MPE 2013) ist ein themenbasiertes Wissenschaftjahr mit einem zusätzlichen Schwerpunkt auf Öffentlichkeitsarbeit. Ursprünglich in Nordamerika unter der Leitung von Christiane Rousseau (Université de Montréal) und am Centre de recherches mathématiques (CRM) initiiert, gelang es der Initiative schnell Begeisterung zu wecken und breitete sich mit über 130 Partnern (einschließlich des MFO) auf alle Kontinente aus. Die Initiative erhielt die Schirmherrschaft der UNESCO und wird vom Internationalen Wissenschaftsrat (ICSU), der Internationalen Mathematischen Union (IMU), der International Commission of Mathematical Instruction (ICMI) und dem International Council of Industrial and Applied Mathematics (ICIAM) unterstützt.

Das Ziel von MPE 2013 ist es, die Beteiligung von Mathematikerinnen und Mathematikern – Wissenschaftlerinnen/Wissenschaftlern, Lehrpersonal, Studierenden und der allgemeinen Bevölkerung – zu stärken, um sich mit der Rolle der Mathematik bei Problemen, die unseren Planeten Erde und seine Zukunft betreffen, auseinanderzusetzen. Die Initiative verfolgt die Strategie, Wissenschaft zu fundamentalen Fragestellungen unseres Planeten zu fördern, die Netzwerkarbeit zwischen Wissenschaftlern aus der Mathematik und aus anderen Disziplinen zu fördern, Studierende zu motivieren, relevante Gebiete zu studieren, in der Schule Themen der Initiative zu vermitteln und das allgemeine Publikum darüber aufzuklären, welche Rolle die Mathematik in Fragen zu unserem Planeten einnehmen kann.

Als Teil der MPE-Initiative ko-organisierte das Mathematische Forschungsinstitut Oberwolfach mit IMAGINARY eine internationale open source Ausstellung an Exponaten in Museumsqualität (genannt Module) zu den Themen von Mathematik des Planeten Erde. Die Ausstellung startete am 5. März 2013 in der UNESCO-Zentrale in Paris und wird ständig erweitert. Alle digitalen Daten zu den Modulen sind über die IMAGINARY-Plattform erhältlich.

Die Module können vervielfältigt werden und von allen rund um den Globus verwendet werden, von Wissenschaftsmuseen bis Schulen. Die interaktiven Module, die in Paris erstmals gezeigt wurden, stammen von einem internationalen Wettbewerb, der von MPE 2013 und IMAGINARY gemeinsam organisiert wurde. Die 3 Gewinner erhielten ihren Preis in Paris bei der UNESCO-Veranstaltung. Die Gewinner waren Daniel Ramos aus Barcelona (Spanien), Tobias Malkmus, Dietmar Kröner und ihr Team der Universität

Mathematics of Planet Earth (MPE 2013)

Mathematics of Planet Earth 2013 (MPE 2013) is a year of scientific and outreach activities on the theme. Initially started in North America under the leadership of Christiane Rousseau (Université de Montréal) and of Centre de recherches mathématiques (CRM), the initiative immediately raised enthusiasm and was enlarged to the world with more than 130 partners (including the MFO) on all continents. It has the patronage of UNESCO and is endorsed by the International Council of Science (ICSU), the International Mathematical Union (IMU), the International Commission of Mathematical Instruction (ICMI) and the International Council of Industrial and Applied Mathematics (ICIAM).

The mission of MPE 2013 is to increase the engagement of mathematicians – researchers, teachers, students – as well as the public, with the role of mathematics in issues affecting our Planet Earth and its future. The strategies are to encourage research to identify and address fundamental questions that have to do with our planet, to increase the networking of researchers in mathematical sciences with researchers of the other disciplines, to encourage mathematics students to pursue research in areas related to our planet earth, to encourage mathematics teachers to communicate issues related to our planet and to inform the public about roles that mathematics can play in addressing questions related to our planet.

As part of the MPE initiative the Mathematisches Forschungsinstitut Oberwolfach and IMAGINARY co-organized an international open source exhibition of museum quality exhibits (called modules) on the theme of Mathematics of Planet Earth. The exhibition was launched on March 5, 2013 at the UNESCO headquarters in Paris and continues to grow. The digital data of all modules are available at the IMAGINARY open source platform.

The modules can be reproduced and utilized by many users around the world from science museums to schools. The interactive modules displayed in Paris for the first time come from an international competition organized by MPE 2013 in collaboration with IMAGINARY. The three winners of the competition received their prize at UNESCO during the MPE Day in Paris. The winners were Daniel Ramos from Barcelona (Spain), Tobias Malkmus, Dietmar Kröner and their team from the University Freiburg

Freiburg (Deutschland) und Guillaume Jouvet und seine Mitarbeiterinnen der FU Berlin (Deutschland).

Die Ausstellung wurde in Bowdoin, USA und als Teil der Ausstellung Formas & Fórmulas in Lissabon, Portugal, gezeigt. Die Ausstellung in Portugal eröffnete im Jahr 2012 und wurde bis Ende 2013 verlängert, sie ist von José Francisco Rodrigues initiiert. Eine spezielle MPE-Installation mit den Gewinner-Modulen eröffnete im November 2013 im MiMa Museum in Oberwolfach. Außerdem wurde eine eigene MPE-Ausstellung mit hands-on Modulen in Bangalore, Indien, präsentiert. Zukünftige Ausstellungen sind im Deutschen Technikmuseum in Berlin und anderen Städten geplant.

Mehr Informationen finden Sie unter:
www.mpe2013.org und
www.imaginary.org/mpe

(Germany) and Guillaume Jouvet and his collaborators from FU Berlin (Germany).

The exhibition was further shown in Bowdoin, USA and in Lisbon, Portugal, at the Formas & Fórmulas exhibition. It started in 2012 and was extended to the end of 2013. The exhibition was initiated by José Francisco Rodrigues. A special MPE installation with the winner modules of the competition started at the MiMa Museum in Oberwolfach in November 2013. Furthermore a special MPE exhibition with many hands-on modules was shown in Bangalore, India. Future exhibitions are planned in the Deutsche Technikmuseum in Berlin and in other cities.

More details can be found at:
www.mpe2013.org and
www.imaginary.org/mpe

Oberwolfach trifft IMAGINARY

Im September 2013 erhielt das MFO im Anschluss an das ursprüngliche Projekt „IMAGINARY – open source Plattform für interaktive Mathematikkommunikation" eine weitere großzügige Förderung der Klaus Tschira Stiftung für den Zeitraum bis zum August 2016 unter dem Titel „Oberwolfach trifft IMAGINARY". Hiermit können erfolgreiche Aktivitäten weitergeführt und internationale Vernetzungen von IMAGINARY ausgebaut werden sowie neue, zusätzliche wissenschaftliche Inhalte durch die Gastwissenschaftler des MFO eingebracht werden.

Ein wichtiger Teil dieses Projektes sind die „Schnappschüsse moderner Mathematik aus Oberwolfach". Darin werden hochwertige Inhalte für die Mathematik-Kommunikationsplattform IMAGINARY über die Teilnehmenden des wissenschaftlichen Programms am MFO gesammelt und überarbeitet. Die von den Organisatorinnen und Organisatoren begutachteten Schnappschüsse beschreiben ein wissenschaftliches Thema im Zusammenhang mit einem Workshop am MFO. Sie sind ca. 4-8 A5-Seiten lang und werden in englischer oder deutscher Sprache verfasst. Der Direktor des MFO spricht die Organisatorinnen und Organisatoren während der Workshops auf die Schnappschüsse an. Das Projekt wird von Carla Cederbaum koordiniert. Sie ist als Chefeditorin für das Editieren der Texte verantwortlich. Unterstützt wird sie von der Editorin Lea Renner. Zielpublikum sind Mathematiklehrkräfte, Wissenschaftsjournalistinnen und -journalisten, Studierende, begabte Schülerinnen und Schüler und andere Interessierte.

Oberwolfach meets IMAGINARY

Following the original project "IMAGINARY - open source platform for interactive mathematics communication", the MFO has been awarded a major grant by the Klaus Tschira Foundation under the name "Oberwolfach meets IMAGINARY", to be implemented from September 2013 until August 2016. This way, successful activities can be continued, the international network can be extended and new content provided by guest researchers of the MFO can be added to the project.

An important part of this project is called "snapshots of modern mathematics from Oberwolfach". Within the project, high-quality content for the mathematics communication platform www.imaginary.org at the MFO is collected from the participants of the Oberwolfach scientific programs. Snapshots address a topic that is related to the research topic of the program at the MFO. They are reviewed by the organizers. Snapshots are 4-8 A5 pages long and written in English or German. The director of the MFO addresses the workshop organizers with respect to the snapshots. The project is coordinated by Carla Cederbaum. As senior editor, she is also responsible for the editing process of the snapshots. Lea Renner supports her as junior editor. The targeted readership consists of mathematics teachers, science journalists, undergraduate, advanced high school students, and the interested public.

Das Schnappschuss-Projekt hat zum Ziel, Verständnis und Wertschätzung für moderne Mathematik und mathematische Forschung in der allgemeinen Bevölkerung weltweit zu fördern. Das Projekt startete im Herbst 2013 mit einer Pilotphase und der Planung der notwendigen Infrastruktur zum Editieren und Verwalten der eingegangenen Schnappschüsse. Die editierten Schnappschüsse werden gesammelt und auf www.imaginary.org/snapshots und zum Teil auf www.mfo.de/math-in-public/snapshots zur Verfügung gestellt.

The snapshot project is designed to promote the understanding and appreciation of modern mathematics and mathematical research in the general public world-wide. The project started in the fall 2013 with a pilot phase and the planning of the required infrastructure for editing and managing submitted snapshots. Edited snapshots are collected and made available to the public on www.imaginary.org/snapshots and in part on www.mfo.de/math-in-public/snapshots.

Ein weiteres neues Projekt ist es, das Netzwerk der Mathematik-Kommunikatorinnen und -Kommunikatoren zu stärken. Dazu werden gerade verschiedene kostenlose Dienste vorbereitet, u.a. ein Newsletter, eine Weltkarte aller Mathematikmuseen, so wie ein gemeinsamer Kalender. Das Projekt wird von Daniel Ramos koordiniert. Mehr Informationen dazu gibt es unter www.imaginary.org/network.

Another new project is to increase networking between mathematics communicators. For this, several free services are being prepared, for example a newsletter, an open map of all mathematics museums and a joint calender. The project is coordinated by Daniel Ramos. More information about the project can be found at www.imaginary.org/network.

Ausstellungsorte 2013

Im Jahr 2013 fanden Ausstellungen und Veranstaltungen in 25 Städten in 17 Ländern statt. Darunter sind auch Vorträge, Workshops, Schulprojekte und eine permanente Museumsinstallation.

Exhibition venues 2013

In 2013, exhibitions were held in 25 cities in 17 countries. Among them are presentations, workshops, school projects and a permanent museum installation.

Liste der Ausstellungen 2013

Hanoi, VIASM, Vietnam
16.12.2013 - 20.12.2013

Quy Nhon City, Vietnam
12.12.2013 - 15.12.2013

Bangalore, Indien
22.11.2013 - 01.12.2013

Krasnojarsk, University, Russland
19.11.2013 - 09.12.2013

Trondheim, Museum, Norwegen
15.11.2013 - 30.03.2014

Tomsk, University, Russland
21.05.2013 - 03.06.2013

04.05.2013 - 05.01.2014
Wolfsburg, phaeno Museum, Deutschland

Puschtschino, Russland
22.04.2013 - 29.04.2013

Aarhus, Dänemark
05.04.2013 - 31.08.2013

List of exhibitions 2013

Hanoi, VIASM, Vietnam
16.12.2013 - 20.12.2013

Quy Nhon City, Vietnam
12.12.2013 - 15.12.2013

Bangalore, India
22.11.2013 - 01.12.2013

Krasnojarsk, University, Russia
19.11.2013 - 09.12.2013

Trondheim, Museum, Norway
15.11.2013 - 30.03.2014

Tomsk, University, Russia
21.05.2013 - 03.06.2013

04.05.2013 - 05.01.2014
Wolfsburg, phaeno Museum, Germany

Pushchino, Russia
22.04.2013 - 29.04.2013

Aarhus, Denmark
05.04.2013 - 31.08.2013

Santiago de Compostela, Spanien
15.03.2013 - 16.05.2013

MPE in Paris, Frankreich
05.03.2013 - 08.03.2013

Nowosibirsk, Russland
04.02.2013 - 16.02.2013

Santiago de Compostela, Spain
15.03.2013 - 16.05.2013

MPE in Paris, France
05.03.2013 - 08.03.2013

Nowosibirsk, Russia
04.02.2013 - 16.02.2013

Liste der Veranstaltungen 2013

Vortrag/Ausstellung, Ho Chi Minh City, Vietnam
21.12.2013 - 23.12.2013

Präsentation/Workshops, Montevideo, Uruguay
18.12.2013 - 20.12.2013

Event, Areatec, Buenos Aires, Argentinien
07.12.2013

ÖMG-DMV-Kongress, Innsbruck, Österreich
23.09.2013 - 27.09.2013

ESMA-Konferenz, University, Cagliari, Italien
18.09.2013 - 20.09.2013

SURFER-Event, phaeno, Wolfsburg, Deutschland
13.09.2013 - 15.09.2013

MathArt-Event, library, Ljubljana, Slowenien
09.09.2013 - 10.09.2013

Ausstellung, Ideen-Expo, Hannover, Deutschland
24.08.2013 - 01.09.2013

Vorträge, Bridges, Enschede, Niederlande
27.07.2013 - 31.07.2013

Workshop, Santa Cruz, Brasilien
20.07.2013

06.06.2013 - 08.06.2013
Präsentation, ECSITE, Gothenburg, Schweden

Ausstellung, Paris, Frankreich
30.05.2013 - 02.06.2013

Workshop, Paris, Frankreich
15.05.2013

Event, Bowdoin, USA
04.04.2013 - 02.06.2013

List of special events 2013

Talk/exhibition, Ho Chi Minh City, Vietnam
21.12.2013 - 23.12.2013

Presentation/workshops, Montevideo, Uruguay
18.12.2013 - 20.12.2013

Performance, Areatec, Buenos Aires, Argentina
07.12.2013

ÖMG DMV congress, Innsbruck, Austria
23.09.2013 - 27.09.2013

ESMA conference, University, Cagliari, Italy
18.09.2013 - 20.09.2013

SURFER event, phaeno, Wolfsburg, Germany
13.09.2013 - 15.09.2013

Math art event, library, Ljubljana, Slovenia
09.09.2013 - 10.09.2013

Exhibition, Ideen-Expo, Hannover, Germany
24.08.2013 - 01.09.2013

Talks, Bridges, Enschede, Netherlands
27.07.2013 - 31.07.2013

Workshop, Santa Cruz, Brazil
20.07.2013

06.06.2013 - 08.06.2013
Presentation, ECSITE, Gothenburg, Sweden

Exhibition, Paris, France
30.05.2013 - 02.06.2013

Workshop, Paris, France
15.05.2013

Event, Bowdoin, USA
04.04.2013 - 02.06.2013

Museumsinstallation 2013

EXPERIMINTA, Frankfurt, Deutschland
06.06.2013

Museum installation 2013

EXPERIMINTA, Frankfurt, Germany
06.06.2013

IMAGINARY-Ausstellung in Aarhus, Dänemark
IMAGINARY exhibtion in Aarhus, Denmark

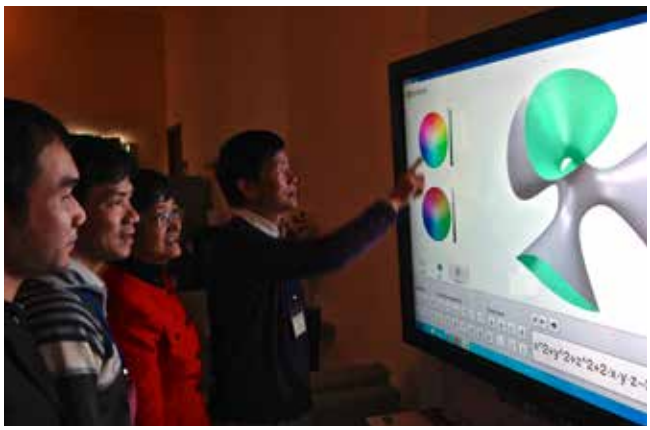
Ausstellung im phaeno Museum in Wolfsburg, Deutschland
Exhibition in the phaeno museum in Wolfsburg, Germany

IMAGINARY-Ausstellung in Krasnojarsk, Russland
IMAGINARY exhibition in Krasnojarsk, Russia

Workhop im Palais de la Decouverte, Paris, Frankreich
Workhop in the Palais de la Decouverte, Paris, France

IMAGINARY-Ausstellung in Trondheim, Norwegen
IMAGINARY exhibition in Trondheim, Norway

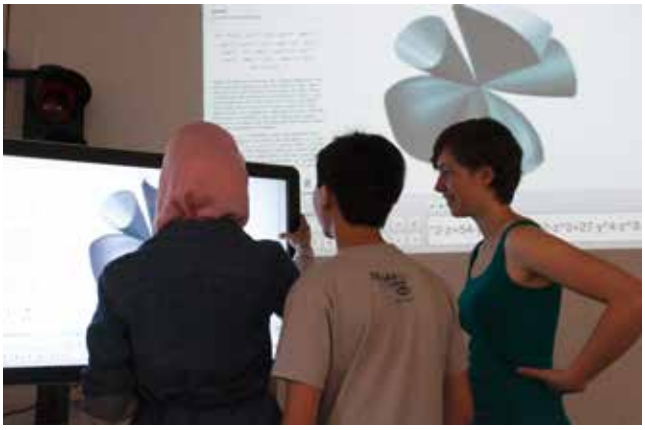
Eröffnung von MPE 2013 in der UNESCO in Paris, Frankreich
Opening of MPE 2013 at the UNESCO in Paris, France



IMAGINARY-Ausstellung in Hanoi, Vietnam
IMAGINARY exhibition in Hanoi, Vietnam

Verleihung des DMV Medienpreises 2013 in Berlin
Award ceremony of the DMV Medienpreis 2013 in Berlin

MPE-Ausstellung in der UNESCO in Paris, Frankreich
MPE exhibition in the UNESCO in Paris, France



Museumsinstallation in Frankfurt, Deutschland
Museum installation in Frankfurt, Germany

MPE-Ausstellung in Bangalore, Indien
MPE exhibition in Bangalore, India

IMAGINARY-Ausstellung in Puschtschino, Russland
IMAGINARY exhibition in Pushchino, Russia

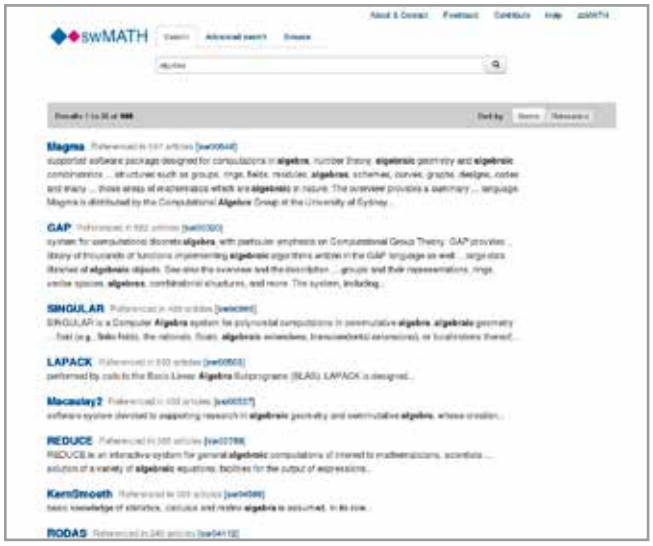
1.4. swMATH

Zum Jahresende 2013 wurde das swMATH Projekt erfolgreich abgeschlossen.

swMATH ist ein Gemeinschaftsprojekt des Mathematischen Forschungsinstituts Oberwolfach und des FIZ Karlsruhe und wurde von der Leibniz-Gemeinschaft gefördert. Fachliche Unterstützung erhielt das Projekt vom DFG-Forschungszentrum MATHEON, dem Felix Klein Zentrum für Mathematik der Universität Kaiserslautern, dem Weierstraß-Institut für Angewandte Analysis und Stochastik (WIAS) und dem Zuse-Institut Berlin (ZIB).

Computer und Software nehmen in der mathematischen Forschung einen immer höheren Stellenwert ein. Es werden mathematische Softwareprodukte zur eigenen Forschung genutzt oder Forschungsergebnisse fließen in die Entwicklung von Softwarepaketen ein. Im Gegensatz zur mathematischen Literatur wird diese Software jedoch nicht systematisch erfasst und nachgewiesen.

swMATH Suchmaske
swMATH search mask



Ergebnisliste zur Suche nach „algebra”
Results for “algebra”

Ziel des Projekts war die Entwicklung und der Aufbau eines umfassenden Nachweissystems für mathematische Software, das die vorhandene und zukünftig veröffentlichte Software in standardisierter Form möglichst vollständig erfasst und durchsuchbar macht. Im Mittelpunkt des Dienstes steht der inhaltliche Zugang, der erstmals eine Verbindung zwischen Software und der dazu veröffentlichten Literatur herstellt.

Software wird auf vielfältige Weise publiziert – vom Closed-Source Binärpaket auf einem Datenträger bis hin zu Open-Source Software im Quelltextformat. Ebenso inhomogen ist die Qualität der verfügbaren Beschreibungen einer

1.4. swMATH

At the end of 2013, the swMATH project was successfully completed.

swMATH is a joint project of the Mathematisches Forschungsinstitut Oberwolfach and FIZ Karlsruhe and was funded by the Leibniz Association. Expert advice was given from the DFG Reseach Center MATHEON, the Felix Klein Center for Mathematics of the University Kaiserslautern, the Weierstrass Institute for Applied Analysis and Stochastics (WIAS) and the Zuse Institute Berlin (ZIB).

The use of Computers and Software in mathematical research is becoming increasingly important. Software products are used for own research or research results are used in the development of software packages. In contrast to mathematical literature, this software is not systematically collected and registered.

The aim of the project was the development and set-up of a comprehensive information service for mathematical software, that collects existing and future software in a standardized form and makes it searchable. The focus of the service is the contextual access that for the first time connects software and its published literature.

Software is published in a variety of ways – from closed-source binary packages on one side to open-source software in source code files. Likewise inhomogeneous is the quality of available descriptions of a software, that range from

Software, deren Bandbreite von kompletten Handbüchern bis zu einem kurzen Überblick im Quellcode reicht. Ein manuell erstellter Nachweisdienst wie die Oberwolfach References of Mathematical Software (ORMS) kann somit wegen der Menge an Software und deren sehr unterschiedlichen Beschreibungen nur mit hohem personellen Aufwand betrieben werden.

In swMATH wurde daher ein völlig neuer Ansatz gewählt. Durch die Zusammenarbeit mit dem Zentralblatt Mathematik (zbMATH) war es möglich, auf dessen umfangreichen Datenbestand von über 3,3 Millionen Einträgen mit Referaten und Abstracts zu mathematischen Publikationen zuzugreifen. Die zunehmende Bedeutung von Software in der Mathematik zeigt sich unter anderem auch an der wachsenden Anzahl an Softwarereferenzen in mathematischen Publikationen. Die Einträge im Zentralblatt liefern daher eine umfangreiche Datenquelle, die mittels heuristischer Methoden systematisch automatisiert nach Softwarereferenzen durchsucht werden kann. Wir bezeichnen dies als publikationsbasierten Ansatz. Dies ermöglicht eine Verknüpfung von Software-Paketen mit Publikationen, mit deren Hilfe einerseits Softwarepakete identifiziert werden und andererseits umfangreich inhaltlich erschlossen werden können. Hierzu zählen unter anderem folgende Metadaten:

- MSC Klassifikation
- Anwendungsgebiete
- Kurzbeschreibungen
- Schlüsselwörter

Autoren der Software, URL und Programmiersprache wurden auch durch zusätzliche manuelle Internetsuche recherchiert.

Zu jedem erfassten Softwarepaket werden zudem möglichst alle Publikationen aufgeführt, die sich auf diese Software beziehen. Insbesondere werden alle Artikel aufgelistet, auf die in zbMATH verwiesen wird.

Die Publikationen können in zwei Klassen eingeteilt werden. Die erste Klasse, die sogenannten Standardartikel, umfasst alle Publikationen zu einer Software, die die theoretischen Grundlagen, Hintergründe und technischen Details erklären. In der zweiten Klasse der Anwenderartikel sind Publikationen enthalten, die die Software für die mathematische Forschung oder eine bestimmte Problemlösung einsetzen und in denen die Software nicht zentraler Bestandteil des Artikels ist. Häufig wird in solchen Anwenderartikeln der Standardartikel einer Software zitiert.

Der Benutzer erhält zu jedem Softwareeintrag in swMATH eine Liste mit diesen Publikationen. Die

complete printed manuals to short descriptions in the source code. A manually created information service like the Oberwolfach References of Mathematical Software (ORMS) can, due to the large number of software and their varying description, only be run with great personnel effort.

Therefore, in swMATH a completely new approach has been chosen. By collaborating with the Zentralblatt Mathematik (zbMATH) it was possible to access its extensive database of over 3.3 million entries of reviews and abstracts for mathematical publications. The increasing importance of software in mathematics is reflected, among other things, in the growing number of software references in mathematical publications. The entries in the Zentralblatt provide a comprehensive data source that can be systematically searched for software references in an automated way by using heuristic methods. We call this the publication based approach. Linking software with publication, on the one hand, allows us to identify software packages and on the other hand, helps describing the software with meta data like

- MSC Classification
- areas of application
- abstracts
- keywords

Software authors, URL and the used programming language also have been researched by additional manual web search.

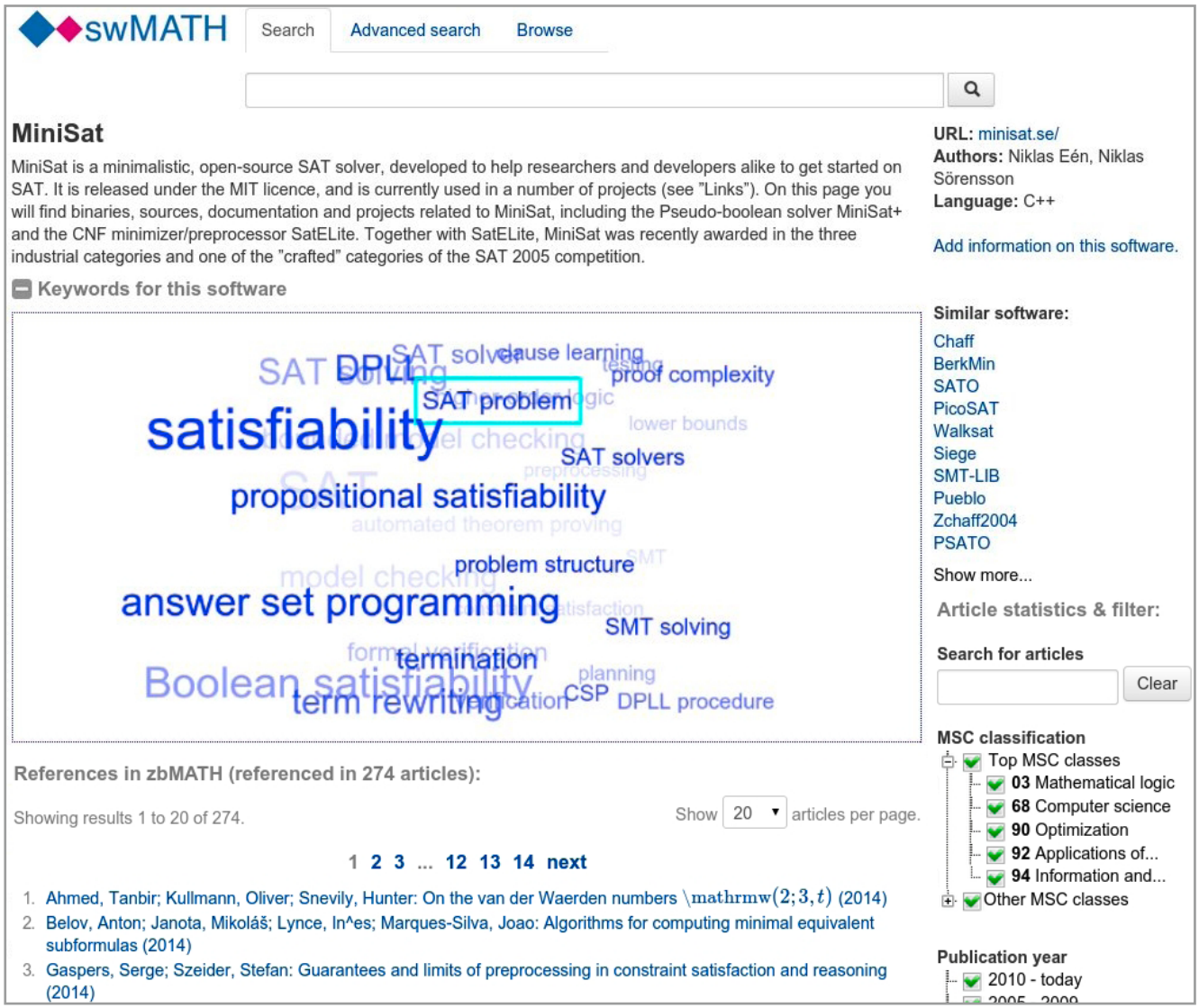
For each registered software package in swMATH references to peer-reviewed mathematical publications are provided which refer to this software. In particular, all such articles referenced in zbMATH are listed.

These publications can be grouped into two classes. The first class, which we call ‘standard publication’, contains all publications describing theoretical principles, backgrounds and technical details of a software. Publications where software has been used for mathematical research or to solve a particular problem, are grouped into the second class which we call ‘user publications’. In these publications, the software is not the central topic. Furthermore, the standard publication of a software is often cited in the user publication.

Each software entry in the swMATH database provides a list of these publications. The list

Einträge sind mit den Abstracts und Reviews zu den Publikationen aus dem Zentralblatt verlinkt. Bislang wurden ca. 68.000 Publikationen identifiziert, die Softwarereferenzen beinhalten.

items are linked to the abstracts and reviews of the publication in Zentralblatt. Currently, approximately 68,000 publications containing software references have been identified.



Detailseite zu einer Software

Detailed entry of a software

Softwareautoren profitieren von der systematischen Sammlung dieser Literaturreferenzen zu ihrer Software durch eine unabhängige Institution und können Aufschluss über die Verbreitung und Einsatzgebiete ihrer Software erhalten.

Software authors benefit from the systematic collection of literature references to their software by an independent institution and can gain interesting insights about the dissemination and usefulness of their software.

Für die Zitation von Software gibt es bisher noch keinen allgemein verwendeten Standard. Teilweise werden die Softwarepakete direkt angegeben, etwa durch die Nennung eines Links zur Homepage der Software. In anderen Fällen wird auf den Standardartikel verwiesen. All dies macht die Suche nach Softwarereferenzen sehr schwierig.

There is yet no existing commonly used standard for the citation of software. In some cases, the software packages are referenced directly, for example by linking to the homepage of a software. In other cases the standard article of a software is referenced. Therefore, the search for software references can become a very difficult task.

Über die verknüpften Publikationen war es möglich, die Software entsprechend der MSC zu klassifizieren. Da es noch kein geeignetes Klassifikationsschema für mathematische Software

Using the linked publications, it was possible to classify software corresponding to the MSC. Since there is no suitable classification scheme for mathematical software, the MSC of the

gibt, konnte die MSC Klassifikation der Publikationen im Zentralblatt verwendet werden, um eine entsprechende Klassifizierung der Software durchzuführen.

publications in Zentralblatt has been used to classify the software accordingly.

Ein weiteres Alleinstellungsmerkmal ist die Liste von ähnlichen Softwareprodukten zu einer gegebenen Software, die von der swMATH Datenbank automatisch erzeugt wird. Normalerweise wäre eine solche Liste nur durch manuelle redaktionelle Arbeit erstellbar und mit hohen Kosten für die Pflege und Erweiterung der Liste verbunden. Durch die vorliegenden verknüpften Publikationen können Softwarepakete, die häufig zusammen im selben Artikel oder in Artikeln mit der selben MSC-Klassifikation auftreten, ermittelt und mittels eines Rankingalgorithmus gewichtet werden. Dies erleichtert es dem Benutzer neue, ihm unbekannte Software zu suchen und sich einen Überblick über vorhandene Produkte zu schaffen.

Another unique feature offered by swMATH is the automatically generated list of similar software products for a given software. Normally, such a list can only be created by manual editorial work and is associated with high cost for maintaining and extending the list. With the help of the linked publications, software packages can be identified and weighted using a ranking algorithm if they are frequently cited together in the same articles or occur in articles with the same MSC classification. This makes it easier for users to find new, unfamiliar software and to gain an overview over existing products.

Der Dienst wurde in die Oberfläche des zbMATH als ein neuer Eintrag „Software" integriert. Nutzer können hier direkt aus der zbMATH-Oberfläche Suchanfragen an die swMATH Datenbank stellen. Zusätzlich erhalten alle Abstracts und Reviews in zbMATH, in deren Publikationen auf in swMATH nachgewiesene Software verwiesen wird, eine Verlinkung zum entsprechenden Softwareeintrag in swMATH.

The service has been integrated into the zbMATH website as a new item "Software". Users can query the swMATH Database directly from the zbMATH website. Additionally, all zbMATH abstracts and reviews of publications with references to software listed in swMATH have a link to the corresponding software entry in swMATH.

Die weitere Pflege von swMATH ist in den Produktionsprozess des zbMATH eingebunden. Über die bereits bekannten Standardartikel können automatisiert neue Referenzen ermittelt und die Literaturliste einer Software erweitert werden. Die Fachredakteure markieren zudem Publikationen, die mathematische Software verwenden und erweitern dadurch den Umfang der nachgewiesenen Software. Eine langfristige Aktualisierung von swMATH ist somit sichergestellt.

Future maintenance of swMATH has been integrated in the production process of zbMATH. Given the known standard articles, new software references can be identified automatically and extend the reference list of a software. Additionally, the editors of zbMATH tag publications that use mathematical software and thereby expand the range of covered software. A long-term update of swMATH is therefore ensured.

Alle in ORMS enthaltenen Softwarepakete sind in swMATH verlinkt. Der Benutzer findet auf der ORMS Webseite zusätzliche Informationen zur Software. Umgekehrt wird von ORMS auf swMATH verlinkt. Softwareeinträge in ORMS wurden mit einer kurzen Liste der in swMATH verlinkten Publikationen ergänzt.

Every software package included in ORMS is linked in swMATH. On the ORMS web page, the user can find further information about the software. Vice versa ORMS is linked to swMATH. Software entries in ORMS were supplemented with a short list of the associated publications in swMATH.

Mit swMATH wurde ein neuartiger Open-Access-Dienst für die mathematische Gemeinschaft entwickelt. Mit aktuell über 6600 Einträgen weist er bei weitem umfangreicher und vollständiger als bestehende Software-Portale mathematische Software nach und stellt sie im mathematischen Kontext der Publikationen dar.

With swMATH, an innovative Open-Access Service for the mathematical community has been created. With currently over 6600 entries it covers far more complete mathematical software and presents it in a mathematical context of the publications.

swMATH steht allen Interessenten unter der Adresse http://swmath.org zur Verfügung.

swMATH is available to interested parties at http://swmath.org.

Das Projekt und der Informationsdienst swMATH wurden auf folgenden relevanten Konferenzen und Tagungen der mathematischen Community vorgestellt:

- DMV Jahrestagungen 2012 und 2013, Minisymposien Information und Kommunikation
- Conference on Intelligent Computer Mathematics (CICM) 2013 in Bath
- MEGA 2013 – Effective Methods in Algebraic Geometry, Frankfurt, 3.-7. Juni 2013, Kurzdarstellung von swMATH
- International Conference on Mathematical Software (ICMS 2014), Seoul, Korea, 5.-9. August 2014

In folgenden Publikationen wurden Beiträge zu swMATH veröffentlicht:

- Mitteilungen der DMV – Gert-Martin Greuel, Wolfram Sperber, swMATH – ein neuer Service für die Suche nach mathematischer Software, Mitteilungen der DMV, Band 21, Heft 1 – April 2013, S. 12-13
- Newsletter der European Mathematical Society – Sebastian Bönisch, Gert-Martin Greuel, Wolfram Sperber: Building an Information Service for Mathematical Software – the SMATH Project, EMS Newsletter, March 2012, Issue 83, S. 51-52
- Computeralgebra Rundbrief – Sebastian Bönisch, Michael Brickenstein, Gert-Martin Greuel, Wolfram Sperber: swMATH – citations for your mathematical software. In Computeralgebra Rundbrief, Nr. 51, Oktober 2012, S. 10-11
- Topics and Issues in Electronic Publishing – Gert-Martin W. Greuel: Changes and Enhancements of the Publication Structure in Mathematics. In K. Kaiser, S. Krantz, B. Wegner (Eds.): Topics and Issues in Electronic Publishing, JMM, Special Session, San Diego, January 2013, p. 41-56.
- Newsletter der European Mathematical Society – Sebastian Bönisch,Gert-Martin Greuel, Wolfram Sperber: The Software Information Service swMATH – Release of the First Online Prototype EMS Newsletter March 2013
- Mitteilungen der DMV – Thomas Vogt: Software dokumentieren! Mitteilungen der DMV, Band 22, Heft 1, 2014.
- ICMS 2014 – Gert-Martin Greuel and Wolfram Sperber: swMATH – An Information Service for Mathematical Software

The project and the services swMATH have been presented to the mathematical community at the following conferences and talks:

- DMV annual meeting 2012 and 2013, Minisymposia “Information und Kommunikation”
- Conference on Intelligent Computer Mathematics (CICM) 2013 in Bath
- MEGA 2013 – Effective Methods in Algebraic Geometry, Frankfurt, 3.-7. June 2013, short presentation of swMATH
- International Conference on Mathematical Software (ICMS 2014), Seoul, Korea, 5.-9. August 2014

Articles about swMATH have been released in the following publications:

- Mitteilungen der DMV – Gert-Martin Greuel, Wolfram Sperber, swMATH – ein neuer Service für die Suche nach mathematischer Software, Mitteilungen der DMV, Band 21, Heft 1 – April 2013, S. 12-13
- Newsletter der European Mathematical Society – Sebastian Bönisch, Gert-Martin Greuel, Wolfram Sperber: Building an Information Service for Mathematical Software – the SMATH Project, EMS Newsletter, March 2012, Issue 83, S. 51-52
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- Topics and Issues in Electronic Publishing – Gert-Martin W. Greuel: Changes and Enhancements of the Publication Structure in Mathematics. In K. Kaiser, S. Krantz, B. Wegner (Eds.): Topics and Issues in Electronic Publishing, JMM, Special Session, San Diego, January 2013, p. 41-56.
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- Mitteilungen der DMV – Thomas Vogt: Software dokumentieren! Mitteilungen der DMV, Band 22, Heft 1, 2014.
- ICMS 2014 – Gert-Martin Greuel and Wolfram Sperber: swMATH – An Information Service for Mathematical Software

1.5. MiMa – Museum für Mineralien und Mathematik Oberwolfach

Das MiMa, Museum für Mineralien und Mathematik Oberwolfach wurde im Januar 2010 eröffnet. Es vereint zwei Alleinstellungsmerkmale der Region in einem neuen interaktiven Museum: die einzigartigen Exponate des Mineralienmuseums Oberwolfach und das Wissen des Mathematischen Forschungsinstituts Oberwolfach.

In der mineralogischen Abteilung sind Mineralien und Bergbauzeugnisse aus dem gesamten Schwarzwald ausgestellt. Aus der Mathematik sehen Sie Multimedia-Installationen zu den Themen Kristallographie und Symmetrien, virtuelle 3D- Flüge, Filme und Skulpturen, darunter auch die Highlights der mathematischen Wanderausstellung IMAGINARY. Die Schnittstellen und Besonderheiten der beiden Bereiche Mineralien und Mathematik werden ästhetisch, wissenschaftlich und interaktiv präsentiert und richten sich an ein breites Publikum. Speziell angesprochen sind auch die Schulen der Umgebung, denen Sonderführungen angeboten werden.

Mehr als 6500 Menschen besichtigten im Jahr 2013 das MiMa.

Sonderveranstaltungen und neues Exponat

Im Jahr 2013 wurde die erfolgreiche Veranstaltungsreihe „Kultur im MiMa" fortgesetzt.

Andreas Matt vom MFO hielt am 4. April einen Vortrag über „Mensch vs. Roboter – wie Maschinen lernen". Manfred Lettau, der frühere Obersteiger der Grube Clara, hielt einen speziellen Vortrag „Ein Bergmannsleben – von der Kohle zum Erz" am 27. Juni.

Am 14. November fand im MiMa der Vortrag „Mathematik: Schlüsseltechnologie für die Zukunft" von Prof. Dr. Dietmar Kröner der Universität Freiburg statt. Nach dem Vortrag wurde eine neue interaktive Touchscreen-Installation mit den drei Gewinnerprogrammen des „Mathematik des Planeten Erde"-Wettbewerbs im MiMa eröffnet.

Am 20. Oktober fand im MiMa ein „Tag der offenen Tür" statt. Als Teil der Leistungsschau des Oberwolfacher Gewerbevereins war das MiMa für alle Besucherinnen und Besucher bei freiem Eintritt ganztägig geöffnet.

Am 27. Oktober 2013 wurde in der Ortsmitte von Oberwolfach der Themenpark „Bergbau, Mineralien und Mathematik" eröffnet. Die aufgestellten Exponate weisen auf die Bedeutung

1.5. MiMa – Museum for Minerals and Mathematics Oberwolfach

The MiMa, Museum for Minerals and Mathematics Oberwolfach opened in January 2010. It combines two unique features of the region in a new interactive museum: the one-of-a-kind collection of the minerals museum Oberwolfach and the knowledge of the Mathematisches Forschungsinstituts Oberwolfach.

In the mineralogical section minerals and historical mining objects are exhibited. In the mathematical section you can find multimedia installations of crystallography and symmetries, virtual 3D-flights, films and sculptures, among them the highlights of the mathematical travelling IMAGINARY exhibition. The connections and characteristics of minerals and mathematics are presented in an aesthetical, scientific and interactive way. The exhibits are directed to a broad public. There is a special focus on schools of the region, for which special guided tours are provided.

In the year 2013, more than 6500 visitors enjoyed the MiMa museum.

Special Events and a new exhibit

The successful event series "Kultur im MiMa" also continued in 2013.

Andreas Matt from the MFO gave a talk about "Human vs. Robots – how machines can learn" on the 4th April. Manfred Lettau, former mine captain at the Grube Clara, gave a unique talk "On the live of a mine worker – from coal to ore" on the 27th of June.

On the 14th of November 2013, a special talk was given by Dietmar Kröner, University Freiburg on "Mathematics – a key technology for the future". After the presentation, a new interactive touch screen installation was inaugurated in the MiMa. It features the three winner modules of the Mathematics of Planet Earth competition.

On the 20th of October 2013, the museum opened its doors for free to all visitors. The "open day" was part of the industrial fair organized by the commercial association in Oberwolfach.

On the 27th of October 2013 the theme park "Mining, Minerals and Mathematics" opened in the center of Oberwolfach. The exhibits illustrate the importance of Oberwolfach as a mining

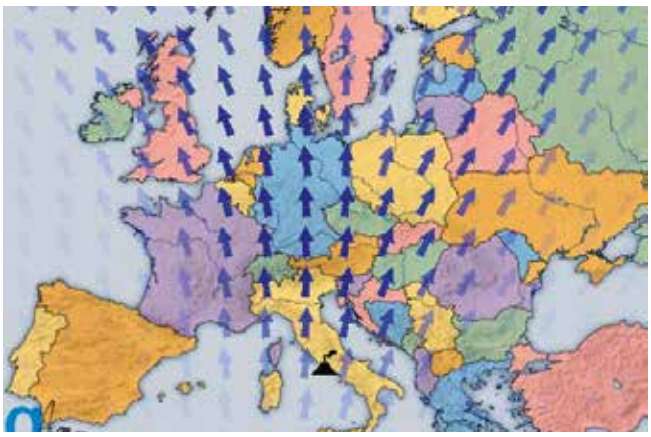
Oberwolfachs als Bergbaugemeinde hin. Besucher können sich über das MiMa und den historischen Bergbau informieren. Neben den zwei Großstufen mit Baryt und Fluorit am Eingang des Themenparks steht auch eine Skulptur mit den fünf ineinander geschachtelten platonischen Körpern – von außen nach innen sind das Ikosaeder, Dodekaeder, Hexaeder (Würfel), Tetraeder und Oktaeder. Die Skulptur wurde in Zusammenarbeit zwischen dem MFO und der Firma Metallbau Armbruster in Oberwolfach entworfen. Ein Stollennachbau und verschiedene Bergbaumaschinen geben einen Überblick über den Bergbau. Auf einer Informationstafel sind weitere Freizeiteinrichtungen in Oberwolfach und Umgebung aufgeführt. Eine Kopie der Skulptur mit den platonischen Körpern wurde auch vor dem MiMa installiert.

Weitere Informationen zum MiMa, den Exponaten und aktuellen Veranstaltungen finden Sie auf der Webseite www.mima.museum.

village. Visitors receive information about the MiMa and historical mining. Two large pieces of barite and fluorite as well as a sculpture with five nested platonic solids (from outside to inside: icosahedron, dodecahedron, hexahedron/cube, tetrahedron and octahedron) are placed at the entrance of the park. The sculpture was designed in collaboration between the MFO and the company Metallbau Armbruster in Oberwolfach. The reconstrucion of a tunnel and various mining machines provide an overview of the mining industry. An information board shows further recreational facilities in Oberwolfach and its environment. A copy of the sculpture with the platonic solids was installed in front of the MiMa.

More information on the MiMa, its exhibits and special events can be found on the web site www.mima.museum.

Andreas Matt bei seinem Vortrag über „Mensch vs. Roboter"
Andreas Matt at his talk about "Humans vs. Robots"



Screenshot des neuen Exponats „Dune Ash"
Screenshot of the new exhibit "Dune Ash"

Eröffnung des Themenparks
Opening of the theme park

Skulptur mit platonischen Körpern vor dem Museum
Sculpture with platonic solids in front of the museum

1.6. Oberwolfach Vorlesung 2013
Prof. Dr. Ursula Hamenstädt

SURFACE GROUPS IN GEOMETRY: THE EHRENPREIS CONJECTURE AND BEYOND

URSULA HAMENSTÄDT

1. Thurston's program

In a very influential note [Th82] published in the Bulletin of the American Mathematical Society in 1982, William Thurston formulated some bold conjectures on the structure of three-dimensional manifolds. He announced the proof of some astonishing theorems that provided evidence for the conjectures (see [O14] for a detailed discussion).

Due to an effort of many outstanding researchers, almost all of his conjectures are verified today. The result which perhaps changed most our understanding of three-dimensional manifolds is Perelman's proof of Thurston's geometrization conjecture. It implies as a corollary the celebrated Poincaré conjecture: a closed simply connected manifold of dimension three is homeomorphic to the three-sphere. Remarkably, Perelman used almost exclusively tools from geometric analysis and metric geometry in his work.

Knowing the geometrization for three-manifolds, what remained was an understanding of the structure of closed hyperbolic three-manifolds. Up to passing to the orientation cover, these manifolds arise as the quotient of hyperbolic 3-space by a cocompact torsion free lattice in $PSL(2,\mathbb{C})$. Thurston conjectured that such a manifold M admits a finite cover M' which fibres over the circle. Shortly before Thurston's death in 2012, Ian Agol [AGM13] proved this conjecture building on work of many other people, most notably on work of Daniel Wise [W12], on joint work of Frederick Haglund and Daniel Wise [HW12] and on joint work of Jeremy Kahn and Vladimir Markovic [KM12].

Once again, the proof of this result mainly uses tools which belong to areas of mathematics different from topology or hyperbolic geometry. In this case, the methods stem from geometric group theory and from the theory of dynamical systems and conformal maps. In fact, the work has some very surprising consequences. Among others, it implies that any cocompact lattice in $SL(2,\mathbb{C})$ embeds into $SL(n,\mathbb{Z})$ for some n.

I devoted the Oberwolfach lecture to a geometric view on the following key ingredient in the proof of the virtual fibred conjecture which is due to Kahn and Markovic [KM12]. For its formulation, a *surface group* is the fundamental group of a closed orientable surface of genus $g \geq 2$. Such a group is generated by $2g$ elements $a_1, b_1, \dots, a_g, b_g$ with one relation $[a_1, b_1] \dots [a_g, b_g] = 1$.

Theorem. *Let Γ be the fundamental group of a closed hyperbolic three-manifold; then Γ contains surface subgroups.*

Date: April 7, 2014.

2. A conjecture of Gromov

Following the foundational work of Gromov [G93], we can view a surface group as a group with a specific type of geometry as follows.

Let for the moment (X, d) be an arbitrary geodesic metric space, i.e. a metric space such that any two points $x, y \in X$ can be connected by a path whose length is just the distance between x and y.

Definition 2.1. (1) For a number $\delta \geq 0$, call a geodesic triangle T in X δ-slim if the δ- neighborhood of two of its sides contains the third side.

(2) A geodesic metric space X is called *hyperbolic in the sense of Gromov* if there exists a number $\delta > 0$ such that any geodesic triangle in X is δ-slim.

Now consider an arbitrary finitely generated group Γ. Choose a finite set $\mathcal{S}$ of generators of Γ with the property that $\mathcal{S}$ contains with each element its inverse as well. This generating set then defines a *Cayley graph* $\mathrm{Cay}(\Gamma)$ for Γ whose vertices are just the elments of Γ, and where two vertices g, h are connected by an edge if $g^{-1}h \in \mathcal{S}$. The graph $\mathrm{Cay}(\Gamma)$ depends on the choice of the generating set $\mathcal{S}$ of Γ.

If we equip each edge with a standard metric of diameter one then this Cayley graph $\mathrm{Cay}(\Gamma)$ becomes a geodesic metric space. Call the group Γ *hyperbolic* if $\mathrm{Cay}(\Gamma)$ is hyperbolic. It is not very hard to see that this does not depend on the choice of the generating set $\mathcal{S}$ (see [BH99] for a comprehensive account).

Hyperbolic groups abound. Simple examples are the free groups F_n with $n \geq 1$ generators, groups which are commensurable to free groups, like the group $SL(2, \mathbb{Z})$, and fundamental groups of closed negatively curved manifolds. In fact, Gromov [G93] showed that "most" finitely generated groups are hyperbolic.

Call a finitely generated group Γ *one-ended* if the following holds true. Remove from a Cayley graph of Γ a finite connected subgraph A. Then $\Gamma - A$ has precisely one unbounded component. Again this does not depend on the choice of a generating set. Examples of one-ended hyperbolic groups are fundamental groups of closed negatively curved manifolds. A free group is not one-ended, neither is a group which is a non-trivial free product. However, "most" hyperbolic groups are one-ended [DGP11].

The following conjecture of Gromov is wide open.

Conjecture: A one-ended hyperbolic group contains surface subgroups.

Recent work of Calegari and Walker [CW13] provides some evidence towards this conjecture. They show that "most" one-ended hyperbolic groups contain surface subgroups.

3. Closed rank one locally symmetric manifolds

A specific class of one-ended hyperbolic groups are cocompact lattices in one of the rank one simple Lie groups $SO(n, 1), SU(n, 1), Sp(n, 1), F_4^{-20}$ of non-compact type. Such groups can be investigated with differential geometric tools, and it turns out that Gromov's conjecture holds true for these groups with the exception of lattices in the groups $SO(2m, 1)$ $(m \geq 2)$ where it is unknown to date [H14].

Theorem 3.1. *A cocompact lattice in a rank one simple Lie group different from* $SO(2m, 1)$ $(m \geq 2)$ *contains surface subgroups.*

The strategy for proving this is as follows. Let Γ be a cocompact lattice in a rank one simple Lie group G. By Selberg's lemma, up to passing to a finite index subgroup we may assume that Γ is torsion free. As a consequence, if we denote by $\tilde{M} = G/K$ the rank one symmetric space defined by G then the quotient $M = \Gamma\backslash\tilde{M}$ is a closed negatively curved manifold. The goal is to construct an immersion $f : S \to M$ of a closed oriented surface S into M which induces an injection of fundamental groups. We call such a map f *incompressible*.

To this end one recalls that any closed oriented surface S of genus $g \geq 2$ can be cut into *pairs of pants*, i.e. compact bordered surfaces which are spheres with three holes. The fundamental group of such a holed sphere is the free group F_2 with two generators.

Constructing immersed incompressible pairs of pants in M can be done as follows. Every primitive conjugacy class in $\pi_1(M)$ determines a periodic geodesic in M. Mixing of the *frame flow* for M can be used to find triples of such periodic geodesics which bound an immersed incompressible pair of pants. With some care one can arrange that this pair of pants is geometrically close to being totally geodesic. More precisely, one may assume that this surface is a minimal surface with Gauss curvature pointwise close to the maximum of the sectional curvature of the ambient space.

For any sufficiently long periodic geodesic there are many such pairs of pants containing this geodesic in their boundary, and these pairs of pants can be glued to an incompressible immersed surface as required.

An argument of this type can also be used to construct specific coverings of closed hyperbolic surfaces, i.e. closed surfaces with a hyperbolic metric. The main (and very substantial) difficulty is as follows. The glueing of pairs of pants to a closed surface amounts to matching of the pants in such a way that for each boundary geodesic of a pair of pants P, there is another pair of pants glued to P along the boundary. This topological condition can be expressed in the form of a family of *glueing equations* for the pairs of pants.

Unfortunately, although these glueing equations are linear, with integral coefficients, in general it is not clear whether they admit a solution. Such a solution can be constructed under additional geometric assumptions [H14] which are not valid for hyperbolic manifolds of even dimension. In particular, there is no ad-hoc solution to the glueing equation in the case that the underlying manifold is a surface itself (and $G = SO(2,1)$).

Kahn and Markovic [KM11] managed to find solutions to the glueing equations in this case as well using homological information. This yields the solution to the celebrated *Ehrenpreis conjecture*.

Theorem 3.2. *Let S, S' be any closed hyperbolic surfaces. Then for every $\epsilon > 0$ there are finite coverings $\hat{S}, \hat{S}'$ of S, S' which are $(1+\epsilon)$-bilipschitz equivalent.*

One may note that in this theorem, one may begin with surfaces which are not homeomorphic, and one finds covers which are not only homeomorphic, but also very close geometrically.

The lecture gives a personal view on a specific aspect of some very recent developments which intertwine geometry and topology. The astonishing work that lead to the completion of Thurston's program openend many doors for new research directions. I expect that these directions will be explored by young people who gather

at Oberwolfach to discuss their innovative ideas, embark in new collaborations and enjoy hikes in the Black Forest.

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2. Wissenschaftliches Programm

Das wissenschaftliche Programm wird vom Direktor in Zusammenarbeit mit der wissenschaftlichen Kommission der Gesellschaft für Mathematische Forschung e.V. entschieden. Dieses für das Programm wichtigste wissenschaftliche Gremium des Instituts basiert auf der ehrenamtlichen Arbeit von ca. 20 - 25 hochkarätigen Mathematikerinnen und Mathematikern, die die gesamte Breite der Mathematik vertreten. Die wissenschaftliche Kommission begutachtet vor ihrer Genehmigung alle wissenschaftlichen Veranstaltungen des Instituts. Das Programm wird in einem wettbewerblichen Verfahren nach streng wissenschaftlichen Kriterien gestaltet. Wie in den Vorjahren erhielt das MFO wesentlich mehr Anträge als genehmigt werden konnten.

2.1. Übersicht der Programme

Das Mathematische Forschungsinstitut Oberwolfach hat sechs zentrale Aufgaben: das Workshop-Programm, das Miniworkshop-Programm, die Oberwolfach Arbeitsgemeinschaft, die Oberwolfach Seminare, das Research in Pairs Programm, sowie die Oberwolfach Leibniz Fellows. Daneben bietet das MFO zusätzliche Serviceleistungen an.

Das Workshop Programm

Das wissenschaftliche Hauptprogramm besteht aus etwa 40 einwöchigen Workshops pro Jahr mit jeweils etwa 50 Teilnehmern. Alternativ können zwei Workshops halber Größe (ca. 25 Teilnehmer) parallel stattfinden. Die Workshops werden von international führenden Experten der jeweiligen Fachgebiete organisiert. Die Teilnehmer werden auf Empfehlung der Organisatoren vom Direktor persönlich eingeladen. Eine Besonderheit der Oberwolfacher Workshops ist die Forschungsorientierung. Sehr häufig weisen Gastforscher darauf hin, wie stimulierend die Atmosphäre sei. Viele bedeutende Forschungsprojekte haben ihre Entstehung der Durchführung eines Workshops in Oberwolfach zu verdanken.

Das Miniworkshop Programm

Im Rahmen dieses Programms können jährlich 12 einwöchige Miniworkshops mit je etwa 15 Teilnehmern veranstaltet werden. Die Miniworkshops wenden sich besonders an junge Forscher und ermöglichen es, auf aktuelle Entwicklungen schnell zu reagieren, da über die Themen der Miniworkshops erst ein halbes Jahr vor der Veranstaltung entschieden wird.

2. Scientific program

The Director of the Institute decides on the scientific program in cooperation with the Scientific Committee of the Gesellschaft für Mathematische Forschung e.V. For the scientific program, this is the most important panel of the Institute. It is based on the honorary work of about 20 to 25 top-class mathematicians, covering all areas of mathematics. The Scientific Committee examines all scientific events at the Institute prior to their approval. The program is fixed in a competitive procedure according to strictly scientific criteria. As in the preceding years, the MFO received many more proposals than could be approved.

2.1. Overview on the program

The Mathematisches Forschungsinstitut Oberwolfach focuses on six central programs: the Workshop Program, the Mini-Workshop Program, the Oberwolfach Arbeitsgemeinschaft, the Oberwolfach Seminars, the Research in Pairs Program, and the Oberwolfach Leibniz Fellows. In addition the MFO provides some further services.

The Workshop Program

The main scientific program consists of about 40 week-long Workshops per year, each with about 50 participants. Alternatively, there can be two parallel Workshops of half size (about 25 participants). The Workshops are organized by internationally leading experts in the relevant fields. The participants are personally invited by the Director after recommendation by the organizers. A special characteristic feature of the Oberwolfach Workshops is the research orientation. Very often the guest researchers appreciate the stimulating atmosphere. Many significant research projects owe their origin to the realisation of a Workshop in Oberwolfach.

The Mini-Workshop Program

This program offers 12 week-long Mini-Workshops per year, each with about 15 participants. These Mini-Workshops are aimed especially at junior researchers, and allow proposals to react to recent developments, since the subjects are fixed only half a year before the Mini-Workshops take place.

Die Oberwolfach Arbeitsgemeinschaft

Die Idee der Arbeitsgemeinschaft für junge, aber auch für bereits etablierte Forscher ist, sich unter Anleitung international anerkannter Spezialisten durch eigene Vorträge in ein neues, aktuelles Gebiet einzuarbeiten. Die Arbeitsgemeinschaft findet zweimal jährlich für jeweils eine Woche statt und wird von Prof. Christopher Deninger und Prof. Gerd Faltings organisiert.

Die Oberwolfach Seminare

Die Oberwolfach Seminare sind einwöchige Veranstaltungen, die sechsmal im Jahr stattfinden. Sie werden von führenden Experten der jeweiligen Fachgebiete organisiert und wenden sich an Doktoranden und Postdoktoranden aus aller Welt. Das Ziel ist es, 25 Teilnehmer in ein besonders aktuelles Arbeitsgebiet einzuführen.

Wir freuen uns, dass die Carl Friedrich von Siemens Stiftung die Oberwolfach Seminare von Sommer 2008 bis Sommer 2013 substanziell unterstützt.

Das Research in Pairs Programm

Ein weiterer Schwerpunkt ist das Programm „Research in Pairs" (RiP). Dieses Programm ermöglicht es jeweils 2 bis 4 Forschern aus verschiedenen Institutionen für 2 Wochen bis 3 Monate am Mathematischen Forschungsinstitut Oberwolfach an einem vorher festzulegenden gemeinsamen Projekt zu arbeiten.

Oberwolfach Leibniz Fellows

In diesem Postdoktoranden-Programm werden seit Januar 2007 besonders qualifizierte Nachwuchswissenschaftler in einer entscheidenden Phase ihrer wissenschaftlichen Laufbahn durch die Bereitstellung idealer Arbeitsbedingungen in einem internationalen Umfeld gefördert. Die jungen Forschenden können sich allein oder in Kleingruppen für die Durchführung eines Forschungsprojekts in Oberwolfach von zwei bis zu sechs Monaten bewerben. Entscheidend ist die Einbindung der Oberwolfach Leibniz Fellows in eine aktive Arbeitsgruppe mit einem etablierten Wissenschaftler einer Universität oder einer Forschungseinrichtung. Es besteht eine Kooperation mit dem europäischen Postdoktorandennetzwerk EPDI, an dem bekannte mathematische Institute teilnehmen (IHES, Newton-Institut, Max-Planck-Institute in Bonn und Leipzig, Mittag-Leffler-Institut, Erwin Schrödinger Institut in Wien, Banach Center in Warschau, Centre de Recerca Matematica in Barcelona, Forschungsinstitut der ETH Zürich).

The Oberwolfach Arbeitsgemeinschaft

The idea of the Arbeitsgemeinschaft ('Research Group') for young as well as for senior researchers is to learn about a new active topic by giving a lecture on it, guided by leading international specialists. The Arbeitsgemeinschaft meets twice per year for one week each time and is organized by Prof. Christopher Deninger and Prof. Gerd Faltings.

The Oberwolfach Seminars

The Oberwolfach Seminars are week-long events taking place six times per year. They are organized by leading experts in the field and address postdocs and Ph.D. students from all over the world. They aim at introducing 25 participants to a particularly hot development.

We are pleased that the Carl Friedrich von Siemens Foundation substiantially supports the Oberwolfach Seminars from summer 2008 to summer 2013.

The Research in Pairs Program

A further main activity of the Institute is the "Research in Pairs Program" (RiP). This program is aimed at small groups of 2-4 researchers from different places working together at the Mathematisches Forschungsinstitut Oberwolfach for 2 weeks up to 3 months on a specific project.

Oberwolfach Leibniz Fellows

The focus of this postdoctoral program, which has started in January 2007, is to support excellent young researchers in an important period of their scientific career by providing ideal working conditions in an international atmosphere. Outstanding young researchers can apply to carry out a research project, individually or in small groups, for a period from two to six months. Oberwolfach Leibniz Fellows should be involved in an active research group with an established senior researcher at a university or another research institute. This is part of a cooperation with the European Post-Doctoral Institute (EPDI) in which well-known mathematical Institutes are already participating (IHES, Newton-Institute, Max-Planck-Institute in Bonn and Leipzig, Mittag-Leffler-Institute, Erwin Schrödinger Institute in Vienna, Banach Center in Warsaw, Centre de Recerca Matematica in Barcelona, Research Institute of ETH Zürich).

Oberwolfach Leibniz Graduate Students

Seit Beginn des Jahres 2009 unterstützt das MFO die Teilnahme von im Durchschnitt fünf Doktoranden an den Oberwolfach Workshops. Gefördert werden exzellente Doktoranden oder frisch Promovierte bis zu zwei Jahren nach der Promotion, insbesondere durch Reisekostenunterstützung. Es handelt sich um fünf zusätzliche Plätze pro Workshop, die für die Oberwolfach Leibniz Graduate Students reserviert sind und nicht durch etablierte Forscher besetzt werden dürfen.

Die Oberwolfach Reports

Um die Ergebnisse der Workshops einem international weiten Kreis zugänglich zu machen, wurde 2004 als neue regelmäßige Publikation die Buchserie „Oberwolfach Reports" (OWR) in Zusammenarbeit mit dem Publishing House der European Mathematical Society gegründet. Sie erscheint jährlich mit 4 Ausgaben von insgesamt mehr als 3.000 Seiten in einer Auflage von 300 Stück. Die OWR beinhalten erweiterte Kurzfassungen aller Vorträge im Umfang von jeweils ein bis drei Seiten, einschließlich Literaturhinweisen, und belegen das ausgezeichnete Niveau der Veranstaltungen. Viele neue Entdeckungen und Entwicklungen wurden im Institut zum ersten Mal einem ausgesuchten Kreis von Forschern vorgestellt und sind in den Oberwolfach Reports dokumentiert. Die OWR sind international auf großes Interesse gestoßen, was sich in der grossen Zahl von Abonnenten und Tauschpartnern zeigt.

Oberwolfach Preis und John Todd Award

Der Oberwolfach Preis wird etwa alle drei Jahre von der Gesellschaft für Mathematische Forschung e.V. und der Oberwolfach Stiftung an junge europäische Forscher verliehen. Der Preis ist für ausgezeichnete Errungenschaften in jeweils wechselnden Gebieten der Mathematik ausgelobt. Das MFO verleiht ebenfalls etwa alle drei Jahre zusammen mit der Oberwolfach Stiftung den John Todd Award für junge Forscher auf dem Gebiet der numerischen Analysis. Der Oberwolfach Preis ist mit 10.000 Euro und der John Todd Award mit 1.000 Euro dotiert.

Weitere Aktivitäten

In zweijährigem Wechsel finden Fortbildungsveranstaltungen für Lehrer bzw. Bibliothekare des Landes Baden-Württemberg statt. Das Institut beherbergt auch die abschliessende Trainingswoche für besonders begabte Schüler zur

Oberwolfach Leibniz Graduate Students

Since the beginning of 2009, the MFO has been supporting the participation of an average of 5 young doctoral students per Oberwolfach Workshop. This program fosters excellent graduate students and recent post docs (the Ph.D./Dr. degree must be received not more than 2 years ago), in particular by the reimbursement of travel costs. For this program, each Oberwolfach Workshop is given an extra capacity of 5 places which is reserved for these young candidates and may not be taken by senior researchers.

The Oberwolfach Reports

The Oberwolfach Reports (OWR) were initiated in 2004 as a new series of publications of the Institute in collaboration with the Publishing House of the European Mathematical Society. They appear quarterly in an edition of 300 copies. The 4 issues comprise more than 3,000 pages per year. The OWR are comprised of official reports of every Workshop, containing extended abstracts of the given talks, of one up to three pages per talk, including references. The aim is to report periodically upon the state of mathematical research, and to make these reports available to the mathematical community. The OWR provide proof of the excellent level of the events at the MFO. Many new discoveries and developments have been introduced at the Institute to a selected group of researchers and are documented in the Oberwolfach Reports. The OWR have been warmly welcomed worldwide, with numerous subscribers and partners participating in exchange arrangements.

Oberwolfach Prize and John Todd Award

The Oberwolfach Prize is awarded by the Gesellschaft für Mathematische Forschung e.V. and by the Oberwolfach Foundation to young European mathematicians. The prize is awarded for excellent achievements in changing fields of mathematics. The Oberwolfach Foundation awards in cooperation with the MFO approximately every three years the John Todd Award to young scientists in numerical analysis. The Oberwolfach Prize amounts to 10,000 Euro and the John Todd Award to 1,000 Euro.

Further activities

On a two-year rotation, a training week for school teachers (respectively librarians) of the State of Baden-Württemberg takes place. The Institute also hosts the final training week for especially gifted pupils to prepare for the

Vorbereitung auf die Internationale Mathematik-Olympiade. Als Dienst für die Öffentlichkeit sind besonders die Oberwolfach Foto-Datenbank, die Oberwolfach References for Mathematical Software (ORMS) und die Wanderausstellung IMAGINARY zu nennen.

International Mathematical Olympiad. As further services provided for the general public the Oberwolfach Photo Collection, the Oberwolfach References for Mathematical Software (ORMS) and the travelling exhibition IMAGINARY are to be mentioned.

2.2. Jahresprogramm 2013

Im Jahr 2013 wurden während 42 Wochen 46 Workshops durchgeführt, 11 Miniworkshops während vier Wochen, 6 Oberwolfach Seminare während drei Wochen und zwei Arbeitsgemeinschaften während zwei Wochen. Insgesamt nahmen mehr als 2400 Forscher aus aller Welt an allen Programmen teil, davon ca. 27% aus Deutschland, 40% aus Resteuropa und 33% aus dem nichteuropäischen Ausland. Das Institut legt großen Wert darauf, dass alle Gebiete der Mathematik und ihre Grenzgebiete, auch im Hinblick auf Anwendungen, vertreten sind. Das folgende Tagungsprogramm belegt diese Politik.

2.2. Annual schedule 2013

In the year 2013 46 workshops have taken place during 42 weeks, as well as 11 Mini-Workshops during four weeks, 6 Oberwolfach Seminars during three weeks and two Arbeitsgemeinschaften during two weeks. In total, more than 2,400 researchers from all over the world attended the Oberwolfach research program, about 27% from Germany, 40% from the rest of Europe, and 33% from non-European countries. The Institute emphasizes that all fields of mathematics and related areas are represented, including applications. The following scientific program gives proof of this policy.

Workshops:

07.01. – 12.01.2013 **Model Theory: Groups, Geometry, and Combinatorics**
Organizers: Ehud Hrushovski, Jerusalem
Anand Pillay, Leeds
Katrin Tent, Münster
Frank Olaf Wagner, Lyon

13.01. – 19.01.2013 **Graph Theory**
Organizers: Reinhard Diestel, Hamburg
Robin Thomas, Atlanta
Gabor Tardos, Burnaby

20.01. – 26.01.2013 **Computational Electromagnetism and Acoustics**
Organizers: Ralf Hiptmair, Zürich
Ronald H. W. Hoppe, Augsburg/Houston
Patrick Joly, Le Chesnay
Ulrich Langer, Linz

27.01. – 02.02.2013 **Numerical Methods for PDE Constrained Optimization with Uncertain Data**
Organizers: Matthias Heinkenschloss, Houston
Volker Schulz, Trier

03.02. – 09.02.2013 **Integral Geometry and its Applications**
Organizers: Semyon Alesker, Tel Aviv
Andreas Bernig, Frankfurt
Franz Schuster, Wien

03.02. – 09.02.2013 **Moduli Spaces in Algebraic Geometry**
Organizers: Dan Abramovich, Providence
Lucia Caporaso, Roma
Gavril Farkas, Berlin
Stefan Kebekus, Freiburg

17.02. – 23.02.2013 **Geophysical Fluid Dynamics**
Organizers: Yoshikazu Giga, Tokyo
Matthias Hieber, Darmstadt
Edriss S. Titi, Irvine/Rehovot

24.02. – 02.03.2013 **Structured Function Systems and Applications**
Organizers: Maria Charina, Dortmund
Jean-Bernard Lasserre, Toulouse
Mihai Putinar, Singapore/Santa Barbara
Joachim Stöckler, Dortmund

03.03. – 09.03.2013 **From "Mixed" to "Applied" Mathematics: Tracing an important dimension of mathematics and its history**
Organizers: Moritz Epple, Frankfurt
Tinne Hoff Kjeldsen, Roskilde
Reinhard Siegmund-Schultze, Kristiansand

10.03. – 16.03.2013 **Representations of Lie Groups and Supergroups**
Organizers: Joachim Hilgert, Paderborn
Toshiyuki Kobayashi, Tokyo
Karl-Hermann Neeb, Erlangen
Tudor Ratiu, Lausanne

17.03. – 23.03.2013 **Interplay of Theory and Numerics for Deterministic and Stochastic Homogenization**
Organizers: Guillaume Bal, New York
Björn Engquist, Austin
Claude Le Bris, Paris
Houman Owhadi, Pasadena

24.03. – 30.03.2013 **Interfaces and Free Boundaries: Analysis, Control and Simulation**
Organizers: Charles M. Elliott, Warwick
Yoshikazu Giga, Tokyo
Michael Hinze, Hamburg
Vanessa Styles, Brighton

07.04. – 13.04.2013 **Algebraic Groups**
Organizers: Michel Brion, Saint-Martin-d'Heres
Jens Carsten Jantzen, Aarhus
Zinovy Reichstein, Vancouver

14.04. – 20.04.2013 **Combinatorics and Probability**
Organizers: Bela Bollobas, Cambridge
Michael Krivelevich, Tel Aviv
Emo Welzl, Zürich

21.04. – 27.04.2013 **Mathematical Statistics of Partially Identified Objects**
Organizers: Victor Chernozhukov, Cambridge MA
Wolfgang Härdle, Berlin
Joel Horowitz, Evanston
Ya'acov Ritov, Jerusalem

21.04. – 27.04.2013 **Extremes in Branching Random Walk and Branching Brownian Motion**
Organizers: Louigi Addario-Berry, Montreal
Nathanael Berestycki, Cambridge
Nina Gantert, Garching

28.04. – 04.05.2013 **Progress in Surface Theory**
Organizers: Uwe Abresch, Bochum
Franz Pedit, Tübingen
Masaaki Umehara, Tokyo

28.04. – 04.05.2013 **Geometric Knot Theory**
Organizers: Dorothy Buck, London
Jason Cantarella, Athens
John M. Sullivan, Berlin
Heiko von der Mosel, Aachen

05.05. – 11.05.2013 **Heat Kernels, Stochastic Processes and Functional Inequalities**
Organizers: Masha Gordina, Storrs
Takashi Kumagai, Kyoto
Laurent Saloff-Coste, Ithaca
Karl-Theodor Sturm, Bonn

26.05. – 01.06.2013 **Complex Algebraic Geometry**
Organizers: Fabrizio Catanese, Bayreuth
Christopher Hacon, Salt Lake City
Yujiro Kawamata, Tokyo
Bernd Siebert, Hamburg

02.06. – 08.06.2013 **Geometric Structures in Group Theory**
Organizers: Martin Bridson, Oxford
Linus Kramer, Münster
Bertrand Remy, Villeurbanne
Karen Vogtmann, Ithaca

09.06. – 15.06.2013 **Hyperbolic Techniques for Phase Dynamics**
Organizers: Rinaldo M. Colombo, Brescia
Philippe G. LeFloch, Paris
Christian Rohde, Stuttgart

16.06. – 22.06.2013 **The Arithmetic of Fields**
Organizers: Moshe Jarden, Tel Aviv
Florian Pop, Philadelphia

16.06. – 22.06.2013 **Quadratic Forms and Linear Algebraic Groups**
Organizers: Detlev Hoffmann, Dortmund
Alexander Merkurjev, Los Angeles
Jean-Pierre Tignol, Louvain-la-Neuve

23.06. – 29.06.2013 **Algebraic K-theory and Motivic Cohomology**
Organizers: Thomas Geisser, Nagoya
Annette Huber-Klawitter, Freiburg
Uwe Jannsen, Regensburg
Marc Levine, Essen

30.06. – 06.07.2013 **Differentialgeometrie im Großen**
Organizers: Olivier Biquard, Paris
Simon Brendle, Stanford
Bernhard Leeb, München

07.07. – 13.07.2013 **Dynamische Systeme**
Organizers: Hakan Eliasson, Paris
Helmut W. Hofer, Princeton
Jean-Christophe Yoccoz, Paris

14.07. – 20.07.2013 **Explicit Methods in Number Theory**
Organizers: Karim Belabas, Bordeaux
Bjorn Poonen, Cambridge MA
Don B. Zagier, Bonn

28.07. – 03.08.2013 **Multiscale and High-Dimensional Problems**
Organizers: Albert Cohen, Paris
Wolfgang Dahmen, Aachen
Ronald A. DeVore, College Station
Angela Kunoth, Paderborn

04.08. – 10.08.2013 **Partial Differential Equations**
Organizers: Alice Chang, Princeton
Camillo De Lellis, Zürich
Reiner Schätzle, Tübingen

11.08. – 17.08.2013 **Nonlinear Waves and Dispersive Equations**
Organizers: Carlos E. Kenig, Chicago
Herbert Koch, Bonn
Daniel Tataru, Berkeley

18.08. – 24.08.2013 **Group Theory, Measure, and Asymptotic Invariants**
Organizers: Miklos Abert, Budapest
Damien Gaboriau, Lyon
Andreas Thom, Leipzig

25.08. – 31.08.2013 **C*-Algebren**
Organizers: Siegfried Echterhoff, Münster
Mikael Rordam, Copenhagen
Stefaan Vaes, Leuven
Dan-Virgil Voiculescu, Berkeley

01.09. – 07.09.2013 **Matrix Factorizations in Algebra, Geometry, and Physics**
Organizers: Ragnar-Olaf Buchweitz, Toronto
Kentaro Hori, Kashiwa
Henning Krause, Bielefeld
Christoph Schweigert, Hamburg

08.09. – 14.09.2013 **Noncommutative Geometry**
Organizers: Alain Connes, Paris
Joachim Cuntz, Münster
Marc A. Rieffel, Berkeley
Guoliang Yu, College Station

15.09. – 21.09.2013 **Lattice Differential Equations**
Organizers: Guillaume James, Grenoble
Dmitry Pelinovsky, Hamilton
Zoi Rapti, Urbana
Guido Schneider, Stuttgart

15.09. – 21.09.2013 **High-Resolution Mathematical and Numerical Analysis of Involution-Constrained PDEs**
Organizers: Bruno Despres, Paris
Michael Dumbser, Trento
James Kamm, Albuquerque
Manuel Torrilhon, Aachen

22.09. – 28.09.2013 **Statistical Inference for Complex Time Series Data**
Organizers: Rainer Dahlhaus, Heidelberg
Oliver Linton, Cambridge
Wei-Biao Wu, Chicago
Qiwei Yao, London

29.09. – 05.10.2013 **Uniform Distribution Theory and Applications**
Organizers: Michael Gnewuch, Kaiserslautern
Frances Y. Kuo, Sydney
Harald Niederreiter, Linz/Dhahran
Henryk Wozniakowski, New York/ Warszawa

20.10. – 26.10.2013 **Analytic Number Theory**
Organizers: Jörg Brüdern, Göttingen
Hugh L. Montgomery, Ann Arbor
Robert C. Vaughan, University Park
Trevor D. Wooley, Bristol

27.10. – 02.11.2013 **Large Scale Stochastic Dynamics**
Organizers: Claudio Landim, Rio de Janeiro
Stefano Olla, Paris
Herbert Spohn, Garching

10.11. – 16.11.2013 **Design and Analysis of Infectious Disease Studies**
Organizers: Martin Eichner, Tübingen
Elizabeth Halloran, Seattle
Philip O'Neill, Nottingham

17.11. – 23.11.2013 **Numerical Solution of PDE Eigenvalue Problems**
Organizers: Andrew Knyazev, Cambridge MA
Volker Mehrmann, Berlin
Jinchao Xu, University Park

01.12. – 07.12.2013 **Classical and Quantum Mechanical Models of Many-Particle Systems**
Organizers: Anton Arnold, Wien
Eric Carlen, Piscataway
Laurent Desvillettes, Cachan

08.12. – 14.12.2013 **Cluster Algebras and Related Topics**
Organizers: Bernhard Keller, Paris
Bernard Leclerc, Caen
Jan Schröer, Bonn

15.12. – 21.12.2013 **Material Theories**
Organizers: Antonio DeSimone, Trieste
Stephan Luckhaus, Leipzig
Lev Truskinovsky, Palaiseau

Miniworkshops:

10.02. – 16.02.2013 **Numerical Upscaling for Media with Deterministic** and Stochastic Heterogeneity
Organizers: Yalchin Efendiev, College Station
Oleg Iliev, Kaiserslautern
Panayot Vassilevski, Livermore

10.02. – 16.02.2013 **The p-Laplacian Operator and Applications**
Organizers: Lars Diening, München
Peter Lindqvist, Trondheim
Bernd Kawohl, Köln

10.02. – 16.02.2013 **Stochastic Analysis for Poisson Point Processes: Malliavin Calculus, Wiener-Ito Chaos Expansions and Stochastic Geometry**
Organizers: Matthias Reitzner, Osnabrück
Giovanni Peccati, Luxembourg

12.05. – 18.05.2013 **Spherical Varieties and Automorphic Representations**
Organizers: Friedrich Knop, Erlangen
Yiannis Sakellaridis, Newark

12.05. – 18.05.2013 **Constructive Homological Algebra with Applications to Coherent Sheaves and Control Theory**
Organizers: Mohamed Barakat, Kaiserslautern
Thierry Coquand, Göteborg
Alban Quadrat, Gif-sur-Yvette

12.05. – 18.05.2013 **Localising and Tilting in Abelian and Triangulated Categories**
Organizers: Lidia Angeleri Hügel, Verona
Steffen Koenig, Stuttgart
Changchang Xi, Beijing

21.07. – 27.07.2013 **Direct and Inverse Spectral Theory of Almost Periodic Operators**
Organizers: David Damanik, Houston
Michael Goldstein, Toronto

21.07. – 27.07.2013 **The Willmore Functional and the Willmore Conjecture**
Organizers: Tobias Lamm, Karlsruhe
Jan Metzger, Potsdam
Andre Neves, London

21.07. – 27.07.2013 **New Crossroads between Mathematics and Field Theory**
Organizers: Romeo Brunetti, Povo
Christian Bär, Potsdam
Claudio Dappiaggi, Pavia
Klaus Fredenhagen, Hamburg

03.11. – 09.11.2013 **Quaternion Kähler Structures in Riemannian** and Algebraic Geometry
Organizers: Anna Fino, Torino
Uwe Semmelmann, Stuttgart
Jaroslaw Wisniewski, Warszawa
Frederik Witt, Münster

03.11. – 09.11.2013 **Inelastic and Non-equilibrium Material Behavior: from Atomistic Structure to Macroscopic Constitutive Relations**
Organizers: Kaushik Dayal, Pittsburgh
Patrick Dondl, Garching
Celia Reina, Philadelphia

Arbeitsgemeinschaften:

31.03. – 05.04.2013 **Limits of Structures**
Organizers: Laszlo Lovasz, Budapest
Balazs Szegedy, Toronto

06.10. – 11.10.2013 **Sofic Entropy**
Organizers: Lewis Bowen, Austin
David Kerr, College Station

Oberwolfach Seminare:

19.05. – 25.05.2013 **Random Networks**
Organizers: Shankar Bhamidi, Chapel Hill
Remco van der Hofstad, Eindhoven
Frank den Hollander, Leiden
Asaf Nachmias, Vancouver

19.05. – 25.05.2013 **Positional Games**
Organizers: Dan Hefetz, Birmingham
Michael Krivelevich, Tel Aviv
Milos Stojakovic, Novi Sad
Tibor Szabo, Berlin

13.10. – 19.10.2013 **Cluster Algebras and Representation Theory**
Organizers: Christof Geiss, Mexico City
David Hernandez, Paris
Bernhard Keller, Paris
Bernard Leclerc, Caen

13.10. – 19.10.2013 **Motivic Integration**
Organizers: Antoine Chambert-Loir, Orsay
Raf Cluckers, Lille
François Loeser, Paris
Johannes Nicaise, Leuven

24.11. – 30.11.2013 **Mathematics for Scientific Programming**
Organizers: Paul Flondor, Bucharest
Jeremy Gibbons, Oxford
Cezar Ionescu, Potsdam

24.11. – 30.11.2013 **The Mathematics of Quantum Chemistry**
Organizers: Eric Cances, Paris
Gero Friesecke, München
Reinhold Schneider, Berlin
Harry Yserentant, Berlin

Fortbildungsveranstaltungen:

02.06. - 08.06.2013 **Trainings- und Abschluß-Seminar für die Internationale Mathematik-Olympiade**
Organizer: Hans-Dietrich Gronau, Rostock

03.11. – 09.11.2013 **Fortbildungsveranstaltung für Bibliotheksleiter in Baden-Württemberg**
Organizer: Petra Hätscher, Konstanz

2.3. Workshops

Workshop 1302

07.01. – 12.01.2013 **Model Theory: Groups, Geometry, and Combinatorics**

Organizers: Ehud Hrushovski, Jerusalem
Anand Pillay, Leeds
Katrin Tent, Münster
Frank Olaf Wagner, Lyon

Abstract

A major theme of the workshop was the use of model theoretic and "nonstandard" methods in (generalized) additive combinatorics, especially the study of "approximate subgroups" and related problems, as well as the relationship with established methods such as asymptotic cones. Several other related topics were included in the meeting, e.g. stability, free groups, and hyperbolic groups, the classification of first order theories as well as connected components and non G-compact theories.

Participants

Altinel, Tuna (Villeurbanne), Baudisch, Andreas (Berlin), Ben Yaacov, Itai (Villeurbanne), Berarducci, Alessandro (Pisa), Bouscaren, Elisabeth (Orsay), Breuillard, Emmanuel (Orsay), Casanovas, Enrique (Barcelona), Chatzidakis, Zoe (Paris), Cherlin, Gregory L. (Piscataway), Chernikov, Artem (Jerusalem), Conversano, Annalisa (Auckland), de la Nuez González, Javier (Münster), Evans, David M. (Norwich), Fornasiero, Antongiulio (Caserta), Gismatullin, Jakub (Wroclaw), Goldbring, Isaac (Chicago), Guingona, Vincent (Notre Dame), Halupczok, Immanuel (Münster), Haskell, Deirdre (Hamilton), Hils, Martin (Paris), Hrushovski, Ehud (Jerusalem), Jahnke, Franziska (Oxford), Jaligot, Eric (Saint-Martin-d'Heres), Kaplan, Itay (Münster), Kim, Byunghan (Seoul), Kowalski, Piotr (Wroclaw), Krupinski, Krzysztof (Wroclaw), Kuhlmann, Salma (Konstanz), Laskowski, M. Chris (College Park), Levitt, Gilbert (Caen), Loeser, Francois (Paris), MacPherson, H. Dugald (Leeds), Martin-Pizarro, Amador (Villeurbanne), Miller, Chris (Columbus), Newelski, Ludomir (Wroclaw), Onshuus, Alf (Bogota), Ould-Houcine, Abderezak (Villeurbanne), Penazzi, Davide (Leeds), Peterzil, Kobi (Haifa), Pillay, Anand (Leeds), Point, Francoise (Paris), Poizat, Bruno (Villeurbanne), Sela, Zlil (Jerusalem), Simon, Pierre (Jerusalem), Sklinos, Rizos (Jerusalem), Starchenko, Sergei S. (Notre Dame), Steinhorn, Charles (Poughkeepsie), Tent, Katrin (Münster), Usvyatsov, Alex (Lisboa), Wagner, Frank Olaf (Villeurbanne), Zilber, Boris I. (Oxford)

Workshop 1303

13.01. – 19.01.2013 **Graph Theory**

Organizers: Reinhard Diestel, Hamburg
Robin Thomas, Atlanta
Gabor Tardos, Burnaby

Abstract

This was a workshop on graph theory, with a comprehensive approach. Highlights included the emerging theories of sparse graph limits and of infinite matroids, new techniques for colouring graphs on surfaces, and extensions of graph minor theory to directed graphs and to immersions.

Participants

Abert, Miklos (Budapest), Allen, Peter D. (London), Bowler, Nathan (Hamburg), Carmesin, Johannes (Hamburg), Chudnovsky, Maria (New York), Conlon, David (Oxford), Csikvari, Peter (Budapest), Diestel, Reinhard (Hamburg), Elek, Gabor (Budapest), Ellis, David C. (Cambridge), Fox, Jacob (Cambridge), Frank, Andras (Budapest), Hamann, Matthias (Hamburg), Hatami, Hamed (Montreal), Haxell, Penny E. (Waterloo), Kaiser, Tomas (Pilsen), King, Andrew D. (Burnaby, B.C.), Kral, Daniel (Coventry), Kriesell, Matthias (Odense), Leader, Imre (Cambridge), Linial, Nathan (Jerusalem), Loebl, Martin (Praha), Lovász, László (Budapest), Marx, Daniel (Budapest), Mohar, Bojan (Burnaby), Norin, Sergey (Montreal), Oum, Sang-il (Daejeon), Pach, Janos (Lausanne), Pendavingh, Rudi (Eindhoven), Postle, Luke (Atlanta), Puder, Doron (Jerusalem), Reiher, Christian (Hamburg), Samal, Robert (Praha), Sauermann, Lisa (Bonn), Schrijver, Alexander (Amsterdam), Seymour, Paul D. (Princeton), Simonyi, Gabor (Budapest), Stein, Maya Jakobine (Santiago de Chile), Szegedy, Balazs (Toronto), Tardos, Gabor (Burnaby), Thomason, Andrew (Cambridge), Thomasse, Stephan (Lyon), van den Heuvel, Jan (London), van der Holst, Hein (Atlanta), Vegh, Laszlo A. (London), Wagner, Stephan (Stellenbosch), Wollan, Paul (Roma), Zhao, Yufei (Cambridge)

Workshop 1304

20.01. – 26.01.2013 **Computational Electromagnetism and Acoustics**

Organizers: Ralf Hiptmair, Zürich
Ronald H. W. Hoppe, Augsburg/Houston
Patrick Joly, Le Chesnay
Ulrich Langer, Linz

Abstract

Computational electromagnetics and acoustics revolve around a few key challenges, among which are the non-local nature of the underlying phenomena and resonance effects. The bulk of the contributions addressed mathematical and numerical approaches meant to grapple with these two difficulties. Frequency domain integral equation methods continue to receive much attention, with a particular focus on (i) frequency robust matrix compression algorithms through so-called directional schemes or "butterfly algorithms", and (ii) domain decomposition approaches. Time domain integral equation methods still enjoy rapid development and much progress was made in their numerical analysis. Efficient and accurate absorbing boundary conditions remain a persistent topic. Resonance induced phenomena in a broad sense affect the analytical and numerical model for meta-materials, periodic structures, and micro-structured media. There is a lot left to be explored in this field in terms of analysis and algorithm development.

Participants

Andriulli, Francesco (Brest), Barnett, Alex (Hanover), Bebendorf, Mario (Bonn), Betcke, Timo (London), Bonnet-Ben Dhia, Anne-Sophie (Palaiseau), Buffa, Annalisa (Pavia), Cassier, Maxence (Palaiseau), Chandler-Wilde, Simon N. (Reading), Chen, Zhiming (Beijing), Chesnel, Lucas (Palaiseau), Ciarlet, Patrick (Palaiseau), Claeys, Xavier (Toulouse), Cools, Kristof (Nottingham), Costabel, Martin (Rennes), Dauge, Monique (Rennes), Demanet, Laurent (Cambridge), Demkowicz, Leszek F. (Austin), Durufle, Marc (Talence), Fliss, Sonia (Palaiseau), Ganesh, Mahadevan (Golden), Graham, Ivan G. (Bath), Grote, Marcus (Basel), Haddar, Houssem (Palaiseau), Heumann, Holger (New Brunswick), Hiptmair, Ralf (Zürich), Hohage, Thorsten (Göttingen), Hoppe, Ronald H. W. (Augsburg), Jerez-Hanckes, Carlos F. (Santiago de Chile), Joly, Patrick (Palaiseau), Kaltenbacher, Manfred (Wien), Kielhorn, Lars (Zürich), Langer, Ulrich (Linz), Lechleiter, Armin (Bremen), Melenk, Jens Markus (Wien), Messner, Matthias (Talence), Michielssen, Eric (Ann Arbor), Moiola, Andrea (Reading), Monk, Peter (Newark), Nannen, Lothar (Wien), Nedelec, Jean-Claude (Palaiseau), Neumüller, Martin (Graz), Pechstein, Clemens (Linz), Peng, Zhen (Columbus), Ramdani, Karim (Vandoeuvre-les-Nancy), Runborg, Olof (Stockholm), Sayas, Francisco J. (Newark), Schmidt, Kersten (Berlin), Schöberl, Joachim (Wien), Spence, Euan (Bath), Steinbach, Olaf (Graz), Tordeux, Sebastien (Pau), Turc, Catalin (Newark)

Workshop 1305

27.01. – 02.02.2013 **Numerical Methods for PDE Constrained Optimization with Uncertain Data**

Organizers: Matthias Heinkenschloss, Houston
Volker Schulz, Trier

Abstract

Optimization problems governed by partial differential equations (PDEs) arise in many applications in the form of optimal control, optimal design, or parameter identification problems. In most applications, parameters in the governing PDEs are not deterministic, but rather have to be modeled as random variables or, more generally, as random fields. It is crucial to capture and quantify the uncertainty in such problems rather than to simply replace the uncertain coefficients with their mean values. However, treating the uncertainty adequately and in a computationally tractable manner poses many mathematical challenges. The numerical solution of optimization problems governed by stochastic PDEs builds on mathematical subareas, which so far have been largely investigated in separate communities: Stochastic Programming, Numerical Solution of Stochastic PDEs, and PDE Constrained Optimization. The workshop achieved an impulse towards cross-fertilization of those disciplines.

Participants

Annunziato, Mario (Fisciano (SA)), Borzi, Alfio (Würzburg), Desideri, Jean-Antoine (Sophia Antipolis), El-Bakry, Amr S. (Houston), Ernst, Oliver (Freiberg), Espig, Mike (Leipzig), Gittelson, Claude Jeffrey (West Lafayette), Gohlke, Jedidiah (Houston), Harbrecht, Helmut (Basel), Heinkenschloss, Matthias (Houston), Henrion, Rene (Berlin), Herzog, Roland (Chemnitz), Heuveline, Vincent (Karlsruhe), Hintermüller, Michael (Berlin), Kostina, Ekaterina A. (Marburg), Kouri, Drew Philip (Houston), Kunisch, Karl (Graz), Litvinenko, Alexander (Braunschweig), Marti, Kurt (Neubiberg), Matthies, Hermann G. (Braunschweig), Mohammadi, Masoumeh (Würzburg), Nobile, Fabio (Lausanne), Novak, Erich (Jena), Potschka, Andreas (Heidelberg), Preusser, Tobias (Bremen), Ridzal, Denis (Albuquerque), Ritter, Klaus (Kaiserslautern), Römisch, Werner (Berlin), Rösch, Arnd (Duisburg), Sachs, Ekkehard (Trier), Schillings, Claudia (Zürich), Schmidt, Stephan (London), Schultz, Rüdiger (Duisburg), Schulz, Volker (Trier), Stoffel, Roland (Trier), Tempone, Raul F. (Jeddah), Tiesler, Hanne (Bremen), Ulbrich, Michael (Garching), Ulbrich, Stefan (Darmstadt), Webster, Clayton G. (Oak Ridge), Zorn, Heinz (Trier)

Workshop 1306a

03.02. – 09.02.2013 **Integral Geometry and its Applications**

Organizers: Semyon Alesker, Tel Aviv
Andreas Bernig, Frankfurt
Franz Schuster, Wien

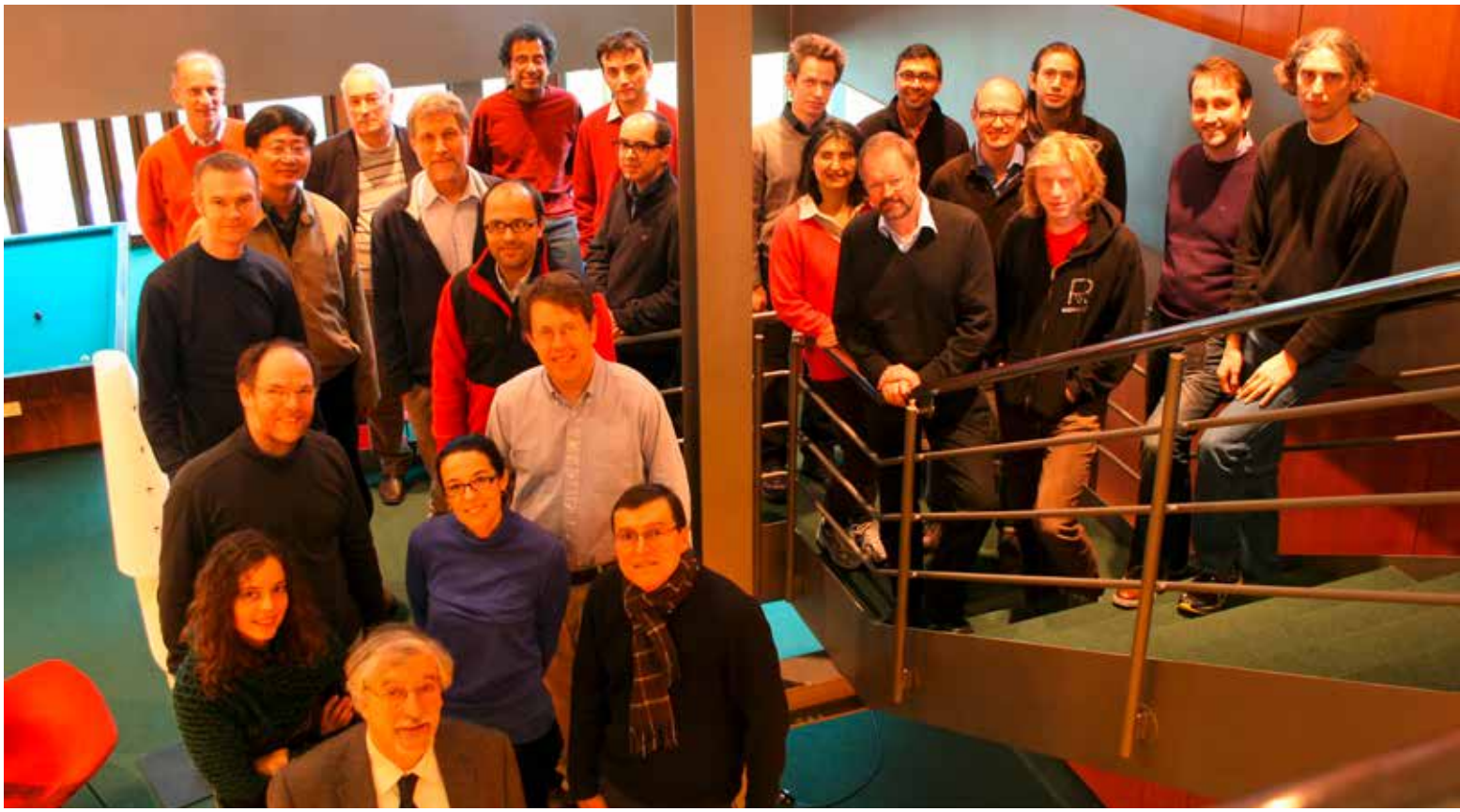
Abstract

In recent years there has been a series of striking developments in modern integral geometry which has, in particular, lead to the discovery of new relations to several branches of pure and applied mathematics. A number of examples were presented at this meeting, e.g. the work of Bernig, Solanes, and Fu on kinematic formulas on complex projective and complex hyperbolic spaces, that of Schneider and Vedel Jensen on tensor valuations and a series of results on convex body valued valuations by Abardia, Ludwig, Parapatits, and Wannerer.

Participants

Abardia, Judit (Frankfurt), Alesker, Semyon (Ramat Aviv, Tel Aviv), Berg, Astrid (Wien), Bernig, Andreas (Frankfurt), Faifman, Dmitry (Tel Aviv), Fu, Joseph (Athens), Hug, Daniel (Karlsruhe), Koldobsky, Alexander (Columbia), Ludwig, Monika (Wien), Ochsenreither, Eva (Karlsruhe), Olafsson, Gestur (Baton Rouge), Palamodov, Victor P. (Tel Aviv), Parapatits, Lukas (Wien), Reitzner, Matthias (Osnabrück), Rotem, Liran (Ramat Aviv, Tel Aviv), Rubin, Boris (Baton Rouge), Saienko, Mykhailo (Frankfurt), Schneider, Rolf (Freiburg), Scott, Ryan (Athens), Solanes Farres, Gil (Bellaterra), Vedel Jensen, Eva B. (Aarhus), Wannerer, Thomas (Frankfurt), Weil, Wolfgang (Karlsruhe), Werner, Elisabeth (Cleveland), Zähle, Martina (Jena)

Workshop 1306b



03.02. – 09.02.2013 **Moduli Spaces in Algebraic Geometry**

Organizers:
Dan Abramovich, Providence
Lucia Caporaso, Roma
Gavril Farkas, Berlin
Stefan Kebekus, Freiburg

Abstract

The workshop on Moduli Spaces in Algebraic Geometry aimed to bring together researchers working in moduli theory, in order to discuss moduli spaces from different points of view, and to give an overview of methods used in their respective fields. The range of expertise covered areas ranging from classical algebraic geometry to mathematics inspired by string theory.

Participants

Abramovich, Dan (Providence), Alper, Jarod (New York), Catanese, Fabrizio (Bayreuth), Faber, Carel F. (Stockholm), Fantechi, Barbara (Trieste), Farkas, Gavril (Berlin), Gibney, Angela (Athens), Greb, Daniel (Bochum), Grushevsky, Samuel (Stony Brook), Hassett, Brendan (Houston), Hulek, Klaus (Hannover), Kebekus, Stefan (Freiburg), Kovács, Sándor J. (Seattle), Kresch, Andrew (Zürich), Li, Jun (Stanford), Melo, Margarida (Coimbra), Olsson, Martin (Berkeley), Pandharipande, Rahul (Zürich), Pixton, Aaron (Princeton), Sernesi, Edoardo (Roma), Siebert, Bernd (Hamburg), Tarasca, Nicola (Hannover), Vakil, Ravi (Stanford), van der Geer, Gerard (Amsterdam), Verra, Alessandro (Roma)

Workshop 1308

17.02. – 23.02.2013 **Geophysical Fluid Dynamics**

Organizers: Yoshikazu Giga, Tokyo
Matthias Hieber, Darmstadt
Edriss S. Titi, Irvine/Rehovot

Abstract

The workshop "Geophysical Fluid Dynamics" addressed recent advances in analytical, stochastic, modeling and computational studies of geophysical rotating fluids models. Of particular interest on the analytical and stochastic sides were the contributions concerning dispersive mechanism, regularity verses finite-time formation of singularities of certain viscous and inviscid geostrophic models, the primitive equations, Boussinesq approximation, boundary layers and fast rotating fluids. Model reductions, based on asymptotic, scaling analysis and variational methods, were presented. In addition, computational investigations were provided in support of the claim that three-dimensional geophysical turbulent flows exhibit two-dimensional features, at small Rosby numbers.

Participants

Abe, Ken (Tokyo), Babin, Anatoli V. (Irvine), Bessaih, Hakima (Laramie), Bothe, Dieter (Darmstadt), Brenier, Yann (Palaiseau), Farhat, Aseel (Bloomington), Farwig, Reinhard (Darmstadt), Feireisl, Eduard (Praha), Geißert, Matthias (Darmstadt), Giga, Yoshikazu (Tokyo), Götze, Karoline (Berlin), Guo, Yanqiu (Rehovot), Hieber, Matthias (Darmstadt), Hishida, Toshiaki (Nagoya), Ibrahim, Slim (Victoria), Ilyin, Alexei A. (Moscow), Iwabuchi, Tsukasa (Tokyo), Kimura, Yoshifumi (Nagoya), Klein, Rupert (Berlin), Koba, Hajime (Tokyo), Korn, Peter (Hamburg), Kukavica, Igor (Los Angeles), Lunasin, Evelyn (Ann Arbor), Maekawa, Yasunori (Kobe), Mahalov, Alex (Tempe), Mazzucato, Anna (University Park), Monniaux, Sylvie (Marseille), Nguyen, Thieu-Huy (Darmstadt), Nussenzveig-Lopes, Helena J. (Rio de Janeiro, RJ -), Oliver, Marcel (Bremen), Otto, Felix (Leipzig), Paul, Thierry (Palaiseau), Prüß, Jan (Halle), Reich, Sebastian (Potsdam), Saal, Jürgen (Darmstadt), Salameh, Josiane (Hamburg), Samelson, Roger M. (Corvallis), Schade, Katharina (Darmstadt), Smith, Leslie (Madison), Stannat, Wilhelm (Berlin), Takada, Ryo (Kyoto), Titi, Edriss S. (Irvine), Tribbia, Joe (Boulder), Yoneda, Tsuyoshi (Sapporo), Ziane, Mohammed (Los Angeles)

Workshop 1309

24.02. – 02.03.2013 **Structured Function Systems and Applications**

Organizers: Maria Charina, Dortmund
Jean-Bernard Lasserre, Toulouse
Mihai Putinar, Singapore/Santa Barbara
Joachim Stöckler, Dortmund

Abstract

Quite a few independent investigations have been devoted recently to the analysis and construction of structured function systems such as e.g. wavelet frames with compact support, Gabor frames, refinable functions in the context of subdivision and so on. However, difficult open questions about the existence, properties and general efficient construction methods of such structured function systems have been left without satisfactory answers. The goal of the workshop was to bring together experts in approximation theory, real algebraic geometry, complex analysis, frame theory and optimization to address key open questions on the subject in a highly interdisciplinary, unique of its kind, exchange.

Participants

Ambrozie, Calin (Praha), Ameur, Yacin (Lund), Budisic, Marko (Santa Barbara), Charina, Maria (Dortmund), Christensen, Ole (Lyngby), Chui, Charles K. (Stanford), Claeys, Mathieu (Toulouse), d'Aspremont, Alexandre (Palaiseau), Ehler, Martin (Neuherberg), Georgiou, Tryphon (Minneapolis), Grepstad, Sigrid (Trondheim), Gröchenig, Karlheinz (Wien), Han, Bin (Edmonton, Alberta), Harrison, Martin (Santa Barbara), He, Wenjie (St. Louis), Henrion, Didier (Toulouse), Jetter, Kurt (Stuttgart), Junk, Michael (Konstanz), Kloos, Tobias (Dortmund), Klotz, Andreas (Wien), Kunis, Stefan (Osnabrück), Lai, Mingjun (Athens), Lasserre, Jean Bernard (Toulouse), Lyubarskii, Yurii (Trondheim), Malinnikova, Eugenia (Trondheim), Netzer, Tim (Leipzig), Pascoe, James Eldred (La Jolla), Pasechnik, Dmitrii V. (Singapore), Perfekt, Karl-Mikael (Lund), Peter, Thomas (Göttingen), Plaumann, Daniel (Konstanz), Plonka-Hoch, Gerlind (Göttingen), Putinar, Mihai (Santa Barbara), Romero, Jose Luis (Wien), Ron, Amos (Madison), Rostalski, Philipp (Berkeley), Scheiderer, Claus (Konstanz), Schmüdgen, Konrad (Leipzig), Schweighofer, Markus (Konstanz), Shen, Zuowei (Singapore), Sikic, Hrvoje (Zagreb), Sinn, Rainer (Konstanz), Springer, Tobias (Dortmund), Stöckler, Joachim (Dortmund), Valmorbida, Giorgio (Oxford), Ward, John Paul (Lausanne)

Workshop 1310

03.03. – 09.03.2013

From "Mixed" to "Applied" Mathematics: Tracing an important dimension of mathematics and its history

Organizers: Moritz Epple, Frankfurt
Tinne Hoff Kjeldsen, Roskilde
Reinhard Siegmund-Schultze, Kristiansand

Abstract

The workshop investigated historical variations of the ways in which historically boundaries were drawn between 'pure' mathematics on the one hand and 'mixed' or 'applied' mathematics on the other from about 1500 until today. It brought together historians and philosophers of mathematics as well as several mathematicians working on applications. Emphasis was laid upon the clarification of the relation between the historical use and the historiographical usefulness and philosophical soundness of the various categories.

Participants

Archibald, Thomas (Burnaby), Aubin, David (Paris), Barrow-Green, June E. (Milton Keynes), Bennett, James Arthur (London), Bergmann, Birgit (Frankfurt am Main), Breard, Andrea (Heidelberg), Chemla, Karine (Paris), Corry, Leo (Tel Aviv), Craik, Alex D.D. (St. Andrews), Cretney, Rosanna (Milton Keynes), Eckert, Michael (München), Epple, Moritz (Frankfurt am Main), Ferreiros, Jose (Sevilla), Gilain, Christian (Paris), Gluchoff, Alan (Villanova), Goldstein, Catherine (Paris), Gray, Jeremy John (Milton Keynes), Hashagen, Ulf (München), Hoff Kjeldsen, Tinne (Roskilde), Kent, Deborah A. (Des Moines), Kranz, Philipp (Wuppertal), Lützen, Jesper (Kobenhavn), Magnello, Eileen (London), Massa, Maria Rosa (Barcelona), Mawhin, Jean (Louvain-la-Neuve), Mrozik, Dagmar (Wuppertal), Nossum, Rolf T. (Kristiansand), Peiffer, Jeanne (Paris), Pulte, Helmut (Bochum), Purkert, Walter (Bonn), Rammer, Gerhard (Berlin), Remmert, Volker (Wuppertal), Ritter, Jim (Saint Denis), Roque, Tatiana (Rio de Janeiro), Rowe, David E. (Mainz), Schappacher, Norbert (Strasbourg), Schlote, Karl-Heinz (Hildesheim), Schneider, Martina (Mainz), Schöttler, Tobias (Bochum), Siegmund-Schultze, Reinhard (Kristiansand), Sorensen, Henrik Kragh (Aarhus), Stephenson, Craig (Madrid), Tobies, Renate (Jena), Tournès, Dominique (Sainte-Clotilde), Wepster, Steven (Utrecht), Zabell, Sandy L. (Evanston)

Workshop 1311

10.03. – 16.03.2013 **Representations of Lie Groups and Supergroups**

Organizers: Joachim Hilgert, Paderborn
Toshiyuki Kobayashi, Tokyo
Karl-Hermann Neeb, Erlangen
Tudor Ratiu, Lausanne

Abstract

The workshop focussed on recent developments in the representation theory of group objects in several categories, mostly finite and infinite dimensional smooth manifolds and supermanifolds. The talks covered a broad range of topics, with a certain emphasis on benchmark problems and examples such as branching, limit behavior, and dual pairs. In many talks the relation to physics played an important role.

Participants

Alldridge, Alexander (Köln), Beltita, Daniel (Bucharest), Caine, John Arlo (Pomona), Creutzig, Thomas (Darmstadt), De Bie, Hendrik (Gent), Duflo, Michel (Paris), Faraut, Jacques (Paris), Gay-Balmaz, Francois (Paris), Glöckner, Helge (Paderborn), Goldin, Gerald A. (Piscataway), Gordina, Masha (Storrs), Heckman, Gert (Nijmegen), Hilgert, Joachim (Paderborn), Iohara, Kenji (Villeurbanne), Ishi, Hideyuki (Nagoya), Janssens, Bas (Erlangen), Jorgensen, Palle E. T. (Iowa City), Kobayashi, Toshiyuki (Tokyo), Krötz, Bernhard J. (Paderborn), Kubo, Toshihisa (Tokyo), Kuit, Job Jacob (Copenhagen), Liu, Gang (Hannover), Medina, Manuel (Reims), Merigon, Stephane (Erlangen), Mickelsson, Jouko (Stockholm), Moellers, Jan (Aarhus), Neeb, Karl-Hermann (Erlangen), Odzijewicz, Anatol (Bialystok), Olafsson, Gestur (Baton Rouge), Orsted, Bent (Aarhus), Oshima, Yoshiki (Tokyo), Ovsienko, Valentin (Villeurbanne), Parthasarathy, Aprameyan (Paderborn), Pasquale, Angela (Metz), Penkov, Ivan (Bremen), Pevzner, Michael (Reims), Przebinda, Tomasz (Norman), Ratiu, Tudor S. (Lausanne), Salmasian, Hadi (Ottawa), Sasaki, Atsumu (Kanagawa), Savchuk, Yurii (Leipzig), Seppänen, Henrik (Göttingen), van den Ban, Erik P. (Utrecht), van Pruijssen, Maarten (Paderborn), Vershik, Anatoli M. (St. Petersburg), Wagner, Stefan (Kobenhavn), Wolf, Joseph Albert (Berkeley), Wurzbacher, Tilmann (Bochum), Yakimova, Oksana (Jena), Zellner, Christoph (Erlangen), Zirnbauer, Martin (Köln)

Workshop 1312

17.03. – 23.03.2013 **Interplay of Theory and Numerics for Deterministic and Stochastic Homogenization**

Organizers: Guillaume Bal, New York
Björn Engquist, Austin
Claude Le Bris, Paris
Houman Owhadi, Pasadena

Abstract

The workshop has brought together experts in the broad field of partial differential equations with highly heterogeneous coefficients. Analysts and computational and applied mathematicians have shared results and ideas on a topic of considerable interest both from the theoretical and applied viewpoints. A characteristic feature of the workshop has been to encourage discussions on the theoretical as well as numerical challenges in the field, both from the point of view of deterministic as well as stochastic modeling of the heterogeneities.

Participants

Abdulle, Assyr (Lausanne), Bal, Guillaume (New York), Berlyand, Leonid (University Park), Blanc, Xavier (Paris), Brisard, Sebastien (Marne-la-Vallee), Butz, Maximilian (Garching), Dalibard-Roux, Anne-Laure (Paris), Duncan, Andrew (Coventry), Efendiev, Yalchin (College Station), Ehrlacher, Virginie (Erlangen), Engquist, Björn (Austin), Fehrman, Benjamin (Chicago), Ghanem, Roger (Los Angeles), Gloria, Antoine (Villeneuve d'Ascq), Gomez, Christophe (Marseille), Gu, Yu (New York), Heitzinger, Clemens (Cambridge), Jing, Wenjia (Paris), Komorowski, Tomasz (Lublin), Le Bris, Claude (Marne-la-Vallee), Legoll, Frederic (Marne-la-Vallee), Lejay, Antoine (Vandoeuvre-les-Nancy), Leugering, Günter (Erlangen), Lipton, Robert (Baton Rouge), Lozinski, Alexei (Besancon), Lukkarinen, Jani (Helsinki), Minvielle, William (Marne-la-Vallee), Murat, Francois (Paris), Neuss-Radu, Maria (Erlangen), Nouy, Anthony (Nantes), Novikov, Alexei (University Park), Otto, Felix (Leipzig), Owhadi, Houman (Pasadena), Pardoux, Etienne (Marseille), Peterseim, Daniel (Berlin), Pinaud, Olivier (Stanford), Puel, Marjolaine (Toulouse), Ray, Nadja (Erlangen), Ryzhik, Lenya (Stanford), Schweizer, Ben (Dortmund), Zeitouni, Ofer (Minneapolis), Zhang, Lei (Shanghai)

Workshop 1313

24.03. – 30.03.2013 **Interfaces and Free Boundaries: Analysis, Control and Simulation**

Organizers: Charles M. Elliott, Warwick
Yoshikazu Giga, Tokyo
Michael Hinze, Hamburg
Vanessa Styles, Brighton

Abstract

The field of mathematical and numerical analysis of systems of nonlinear partial differential equations involving interfaces and free boundaries is a flourishing area of research. Many systems arise from mathematical models in material science, fluid dynamics and biology. The governing equations for the dynamics of the interfaces in many applications involve surface tension expressed in terms of the mean curvature and a driving force. The forcing terms depend on variables that are solutions of additional partial differential equations which hold either on the interface itself or in the surrounding bulk regions. Often suitable performance indices and appropriate control actions have to be specified. This leads to optimization problems with partial differential equation constraints including free boundaries. In order to address such control problems interaction between distinct mathematical fields is required. By bringing together leading experts and young researchers from these fields we intended to develop novel research directions in applied and computational mathematics.

Participants

Abels, Helmut (Regensburg), Alt, Hans Wilhelm (München), Bartels, Sören (Freiburg), Bellettini, Giovanni (Roma), Blank, Luise (Regensburg), Brett, Charles (Coventry), Bucur, Dorin (Le Bourget du Lac), Chambolle, Antonin (Palaiseau), Deckelnick, Klaus (Magdeburg), Elliott, Charles M. (Coventry), Feng, Xiaobing H. (Knoxville), Fischer, Julian (Erlangen), Forcadel, Nicolas (Paris), Fritz, Hans (Freiburg), Garcke, Harald (Regensburg), Giga, Mi-Ho (Tokyo), Giga, Yoshikazu (Tokyo), Gräser, Carsten (Berlin), Hamamuki, Nao (Tokyo), Hintermüller, Michael (Berlin), Hinze, Michael (Hamburg), Hoffmann, Karl-Heinz (Garching), Kahle, Christian (Hamburg), Kenmochi, Nobuyuki (Kyoto), King, John R. (Nottingham), Kornhuber, Ralf (Berlin), Lam, Kei Fong (Coventry), Leugering, Günter (Erlangen), Luckhaus, Stephan (Leipzig), Marschall, Holger (Darmstadt), Meyer, Christian (Dortmund), Monneau, Regis (Marne-la-Vallee), Nakayasu, Atsushi (Tokyo), Nochetto, Ricardo H. (College Park), Ohtsuka, Takeshi (Maebashi), Pinnau, René (Kaiserslautern), Ranner, Tom (Coventry), Reusken, Arnold (Aachen), Rocca, Elisabetta (Milano), Röger, Matthias (Dortmund), Sethian, James A. (Berkeley), Simonett, Gieri (Nashville), Sprekels, Jürgen (Berlin), Stinner, Björn (Coventry), Styles, Vanessa (Brighton), Tsai, Yen-Hsi Richard (Austin), Venkataraman, Chandrashekar (Brighton), Wirth, Benedikt (New York), Witterstein, Gabriele (München), Yamamoto, Masahiro (Tokyo)

Workshop 1315

07.04. – 13.04.2013 **Algebraic Groups**
Organizers: Michel Brion, Saint-Martin-d'Heres
Jens Carsten Jantzen, Aarhus
Zinovy Reichstein, Vancouver

Abstract
Linear algebraic groups is an active research area in contemporary mathematics. It has rich connections to algebraic geometry, representation theory, algebraic combinatorics, number theory, algebraic topology, and differential equations. The foundations of this theory were laid by A. Borel, C. Chevalley, T. A. Springer and J. Tits in the second half of the 20th century. The Oberwolfach workshops on algebraic groups, led by Springer and Tits, played an important role in this effort as a forum for researchers, meeting at approximately 3 year intervals since the 1960s. The present workshop continued this tradition, featuring a number of important recent developments in the subject.

Participants
Andersen, Henning Haahr (Aarhus), Avdeev, Roman (Moscow), Benoist, Olivier (Paris), Bonnafe, Cedric (Montpellier), Braverman, Alexander (Providence), Bravi, Paolo (Roma), Brion, Michel (Saint-Martin-d'Heres), Brosnan, Patrick (College Park), Buch, Anders S. (Piscataway), Chaput, Pierre-Emmanuel (Vandoeuvre-les-Nancy), Fiebig, Peter (Erlangen), Florence, Mathieu (Paris), Funch Thomsen, Jesper (Aarhus), Gabber, Ofer (Bures-sur-Yvette), Geck, Meinolf (Stuttgart), Goodwin, Simon (Birmingham), He, Xuhua (Kowloon), Henderson, Anthony (Sydney), Herpel, Sebastian (Kaiserslautern), Huruguen, Mathieu (Vancouver), Jantzen, Jens Carsten (Aarhus), Juteau, Daniel (Caen), Knop, Friedrich (Erlangen), Kraft, Hanspeter (Basel), Kresch, Andrew (Zürich), Kübel, Johannes (Erlangen), Kumar, Shrawan (Chapel Hill), Kuttler, Jochen (Edmonton), Lakshmibai, Venkatramani (Boston), Lehrer, Gustav I. (Sydney), Littelmann, Peter (Köln), Loetscher, Roland (München), Maffei, Andrea (Pisa), Mehta, Vikram B. (Mumbai), Panyushev, Dmitri I. (Moscow), Perrin, Nicolas (Bonn), Pezzini, Guido (Erlangen), Popov, Vladimir L. (Moscow), Premet, Alexander (Manchester), Procesi, Claudio (Roma), Rapinchuk, Igor A. (New Haven), Reichstein, Zinovy (Vancouver), Ressayre, Nicolas (Villeurbanne), Riche, Simon (Aubiere), Röhrle, Gerhard (Bochum), Sam, Steven V. (Berkeley), Soergel, Wolfgang (Freiburg), Stroppel, Catharina (Bonn), Terpereau, Ronan (Grenoble), Vasserot, Eric (Paris), Williamson, Geordie (Bonn), Zainoulline, Kirill (Ottawa)

Workshop 1316

14.04. – 20.04.2013 **Combinatorics and Probability**

Organizers: Bela Bollobas, Cambridge
Michael Krivelevich, Tel Aviv
Emo Welzl, Zürich

Abstract

The main theme of this workshop was the use of probabilistic methods in combinatorics and theoretical computer science. Although these methods have been around for decades, they are being refined all the time: they are getting more and more sophisticated and powerful. Another theme was the study of random combinatorial structures, either for their own sake, or to tackle extremal questions. Both themes were richly represented at the workshop, with many recent exciting results presented by the lecturers.

Participants

Alon, Noga (Tel Aviv), Balister, Paul (Memphis), Balogh, Jozsef (Urbana), Bollobas, Bela (Cambridge), Coja-Oghlan, Amin (Frankfurt), Conlon, David (Oxford), Dietzfelbinger, Martin (Ilmenau), Duminil-Copin, Hugo (Geneve), Fox, Jacob (Cambridge), Friedgut, Ehud (Rehovot), Frieze, Alan M. (Pittsburgh), Furedi, Zoltan (Urbana), Gamarnik, David (Cambridge), Gebauer, Heidi (Zürich), Gunderson, Karen (Bristol), Janson, Svante (Uppsala), Jerrum, Mark R. (London), Kahn, Jeff (Piscataway), Kang, Mihyun (Graz), Kannan, Ravindran (Mountain View), Karonski, Michal (Poznan), Kim, Jeong Han (Seoul), Kohayakawa, Yoshiharu (Sao Paulo), Krivelevich, Michael (Tel Aviv), Lee, Choongbum (Los Angeles), Linial, Nathan (Jerusalem), Luczak, Tomasz (Poznan), Morris, Robert (Rio de Janeiro), Nesetril, Jaroslav (Praha), Noy, Marc (Barcelona), Pach, Janos (Lausanne), Reischuk, Rüdiger (Lübeck), Riordan, Oliver M. (Oxford), Samotij, Wojciech (Cambridge), Schacht, Mathias (Hamburg), Schöning, Uwe (Ulm), Scott, Alex (Oxford), Shapira, Asaf (Ramat Aviv, Tel Aviv), Smith, Paul (Rio de Janeiro), Sohler, Christian (Paderborn), Solymosi, Jozsef (Vancouver), Sorkin, Gregory B. (London), Sós, Vera T. (Budapest), Steger, Angelika (Zürich), Sudakov, Benjamin (Los Angeles), Szabo, Tibor (Berlin), Tardos, Gabor (Budapest), Tetali, Prasad (Atlanta), Thomason, Andrew (Cambridge), Warnke, Lutz (Cambridge), Welzl, Emo (Zürich), Zhao, Yufei (Cambridge)

Workshop 1317a

21.04. – 27.04.2013 **Mathematical Statistics of Partially Identified Objects**

Organizers: Victor Chernozhukov, Cambridge MA
Wolfgang Härdle, Berlin
Joel Horowitz, Evanston
Ya'acov Ritov, Jerusalem

Abstract

The workshop brought together leading experts in mathematical statistics, theoretical econometrics and bio-mathematics interested in mathematical objects occurring in the analysis of partially identified structures. The mathematical core of these ubiquitous structures has an impact on all three research areas and is expected to lead to the development of new algorithms for solving such problems.

Participants

Bugni, Federico A. (Durham), Bühlmann, Peter (Zürich), Canay, Ivan (Evanston), Chesher, Andrew (London), Dette, Holger (Bochum), Galichon, Alfred (Paris), Grith, Maria (Berlin), Härdle, Wolfgang Karl (Berlin), Henry, Marc (Montreal), Horowitz, Joel L. (Evanston), Krivobokova, Tatyana (Göttingen), Lee, Sokbae (Seoul), Liao, Yuan (College Park), Mammen, Enno (Mannheim), Meinshausen, Nicolai (Oxford), Molchanov, Ilya S. (Bern), Molinari, Francesca (Ithaca), Newey, Whitney K. (Cambridge), Ritov, Yaacov (Jerusalem), Rosen, Adam M. (London), Spokoiny, Vladimir G. (Berlin), Tran, Ngoc Mai (Berkeley), Wang, Weining (Berlin)

Workshop 1317b

21.04. – 27.04.2013 **Extremes in Branching Random Walk and Branching Brownian Motion**

Organizers: Louigi Addario-Berry, Montreal
Nathanael Berestycki, Cambridge
Nina Gantert, Garching

Abstract

Branching random walk (BRW) and branching Brownian motion (BBM) are mathematical models for population growth and spatial displacement. When resources are plentiful, population sizes grow exponentially in time. In such a situation, exceptional (or extreme) individuals will be found far from the bulk of the population. The study of such individuals, and their ancestral lineages, was the subject of the workshop. On one hand, this is a classical topic, with well-known connections to the KPP-equation and to search algorithms. On the other hand, substantial recent developments have recently been obtained via new approaches to the subject (stopping lines and spines, the view from the tip, multivariate analytic combinatorics), or from researchers working in seemingly distinct areas (from stochastic partial differential equations to theoretical physics).

Participants

Addario-Berry, Louigi (Montreal), Aidekon, Elie (Eindhoven), Arguin, Louis-Pierre (Montreal, Quebec), Bérard, Jean (Villeurbanne), Berestycki, Nathanael (Cambridge), Broutin, Nicolas (Le Chesnay), Brunet, Éric (Paris), Eckhoff, Maren (Bath), Gantert, Nina (Garching bei München), Goldschmidt, Christina (Oxford), Haas, Benedicte (Paris), Harris, Simon (Bath Somerset), Hesse, Marion (Bath), Hu, Yueyun (Villetaneuse), Kyprianou, Andreas E. (Bath), Maillard, Pascal (Rehovot), Öz, Mehmet (Istanbul), Quastel, Jeremy (Toronto), Ramirez, Alejandro F. (Santiago), Roberts, Matthew (Bath), Schweinsberg, Jason (La Jolla), Simon, Damien (Paris), Zeitouni, Ofer (Rehovot), Zhao, Lee Zhuo (Cambridge), Zindy, Olivier (Paris)

Workshop 1318a

28.04. - 04.05.2013 **Progress in Surface Theory**

Organizers: Uwe Abresch, Bochum
Franz Pedit, Tübingen
Masaaki Umehara, Tokyo

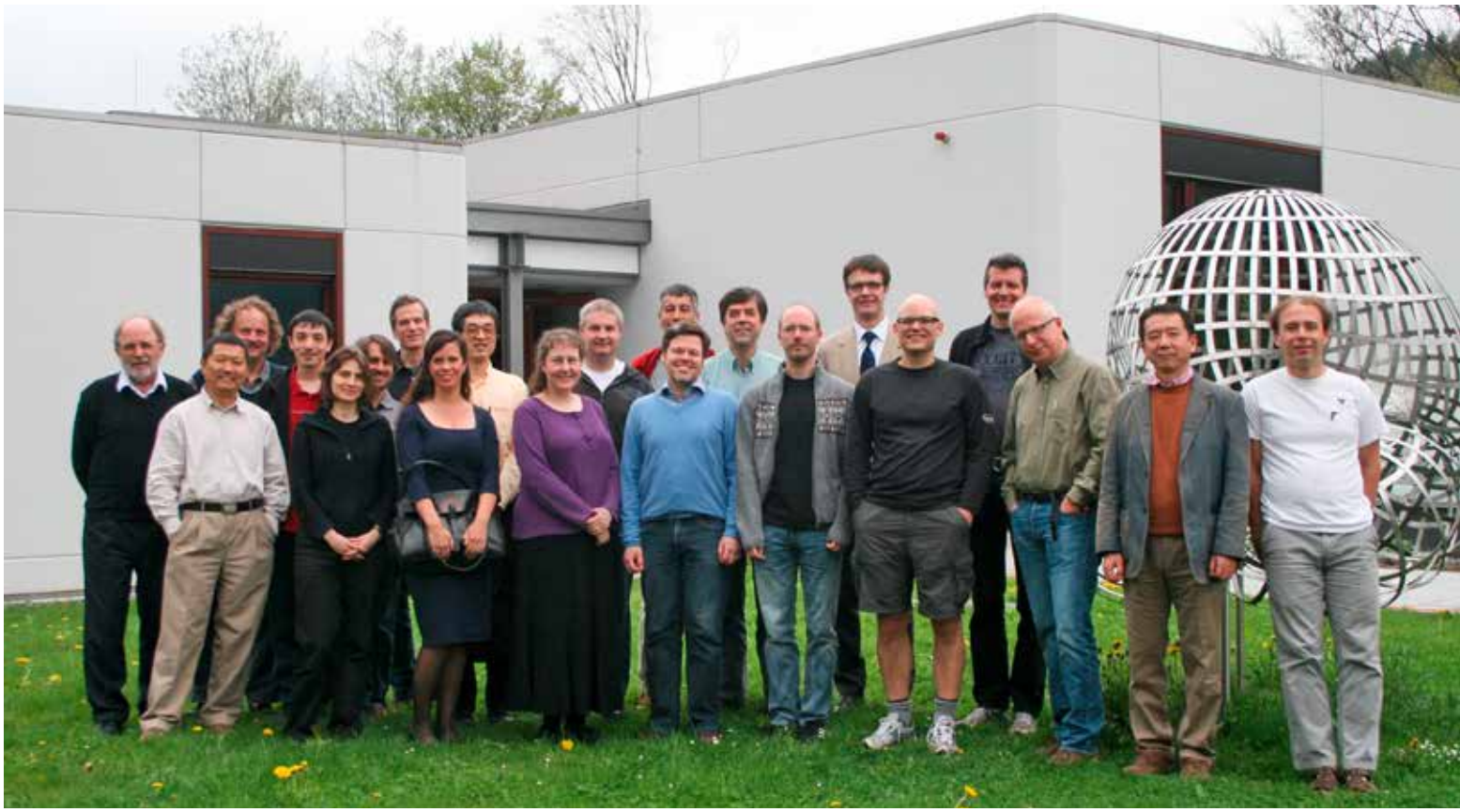
Abstract

Over the last 30 years global surface theory has become pivotal in the understanding of low dimensional global phenomena. At the same time surface geometry became a platform on which seemingly different areas of mathematics – such as geometric and topological analysis, integrable systems, algebraic geometry of curves, and mathematical physics – coalesce to produce far reaching ideas, conjectures, methods and results. The workshop hosted talks on the resolutions of famous conjectures in surface geometry, including the Willmore conjecture, and on exciting new progress in the understanding of moduli spaces of special surface classes.

Participants

Abresch, Uwe (Bochum), Andrews, Ben (Canberra), Bohle, Christoph (Tübingen), Burstall, Francis E. (Bath), Desideri, Laura (Villeneuve d'Ascq), Dorfmeister, Josef F. (Garching), Grosse-Brauckmann, Karsten (Darmstadt), Haskins, Mark (London), Heller, Lynn (Tübingen), Heller, Sebastian (Tübingen), Hertrich-Jeromin, Udo (Wien), Honda, Atsufumi (Miyazaki), Klingenberg, Wilhelm H. (Durham), Ma, Hui (Beijing), Miyaoka, Reiko (Sendai), Neves, Andre (London), Ohnita, Yoshihiro (Osaka), Pedit, Franz (Tübingen), Perez, Joaquin (Granada), Pinkall, Ulrich (Berlin), Rossman, Wayne (Kobe), Schmidt, Martin Ulrich (Mannheim), Shoda, Toshihiro (Saga), Siffert, Anna (Bochum), Umehara, Masaaki (Tokyo), Yamada, Kotaro (Tokyo)

Workshop 1318b



28.04. 04.05.2013 **Geometric Knot Theory**

Organizers: Dorothy Buck, London
Jason Cantarella, Athens
John M. Sullivan, Berlin
Heiko von der Mosel, Aachen

Abstract

Geometric knot theory studies relations between geometric properties of a space curve and the knot type it represents. As examples, knotted curves have quadrisecant lines, and have more distortion and more total curvature than (some) unknotted curves. Geometric energies for space curves – like the Möbius energy, ropelength and various regularizations – can be minimized within a given knot type to give an optimal shape for the knot. Increasing interest in this area over the past decade is partly due to various applications, for instance to random knots and polymers, to topological fluid dynamics and to the molecular biology of DNA. This workshop focused on the mathematics behind these applications, drawing on techniques from algebraic topology, differential geometry, integral geometry, geometric measure theory, calculus of variations, nonlinear optimization and harmonic analysis.

Participants

Adams, Colin C. (Williamstown), Blatt, Simon (Karlsruhe), Buck, Dorothy (London), Budney, Ryan (Victoria), Cantarella, Jason (Athens), Denne, Elizabeth (Lexington), Diao, Yuanan (Charlotte), El Khatib, Thomas (Berlin), Ernst, Claus (Bowling Green), Hass, Joel (Davis), Jin, Gyo Taek (Daejeon), Kolasinski, Slawomir (Golm), Kusner, Robert B. (Amherst), Millett, Ken C. (Santa Barbara), O'Hara, Jun (Tokyo), Rawdon, Eric J. (St. Paul), Reiter, Philipp (Duisburg), Scholtes, Sebastian (Aachen), Shonkwiler, Clayton (Athens), Strzelecki, Pawel (Warszawa), Sullivan, John M. (Berlin), Szumanska, Marta (Warszawa), von der Mosel, Heiko (Aachen)

Workshop 1319

05.05. – 11.05.2013 **Heat Kernels, Stochastic Processes and Functional Inequalities**

Organizers: Masha Gordina, Storrs
Takashi Kumagai, Kyoto
Laurent Saloff-Coste, Ithaca
Karl-Theodor Sturm, Bonn

Abstract

The general topic of the workshop was the study of linear and non-linear diffusions in geometric environments: finite and infinite-dimensional manifolds, metric spaces, fractals and graphs, including random environments. The workshop provided a unique opportunity for interaction between leading researchers and young scientists from analysis, probability and geometry. Unifying themes were heat kernel analysis, mass transport problems and related functional inequalities such as Poincaré, Sobolev, logarithmic Sobolev, Bakry-Emery, Otto-Villani and Talagrand inequalities. These concepts were at the heart of Perelman's proof of Poincaré's conjecture, as well as of the development of the Otto calculus, and the synthetic Ricci bounds of Lott-Sturm-Villani. During the workshop we discussed how these techniques can be used to approach problems in optimal transport for non-local operators, subelliptic operators in finite and infinite dimensions, analysis on singular spaces, as well as random walks in random media.

Participants

Ambrosio, Luigi (Pisa), Andres, Sebastian (Bonn), Arnaudon, Marc (Talence), Ba, Moustapha (Marseille), Bakry, Dominique (Toulouse), Barlow, Martin T. (Vancouver), Bass, Richard F. (Storrs), Baudoin, Fabrice (West Lafayette), Bendikov, Alexander (Wroclaw), Biskup, Marek (Los Angeles), Burdzy, Krzysztof (Seattle), Chen, Zhen-Qing (Seattle), Coulhon, Thierry (Canberra), Croydon, David (Coventry), Cruzeiro, Ana Bela (Lisboa), Deuschel, Jean Dominique (Berlin), Eldredge, Nathaniel (Ithaca), Elworthy, David (Coventry), Erbar, Matthias (Bonn), Fang, Shizan (Dijon), Garofalo, Nicola (West Lafayette), Gigli, Nicola (Nice), Gordina, Masha (Storrs), Guillin, Arnaud (Aubiere), Hambly, Ben (Oxford), Hinz, Michael (Jena), Huang, Xueping (Jena), Huesmann, Martin (Bonn), Kajino, Naotaka (Kobe), Kassmann, Moritz (Bielefeld), Kigami, Jun (Kyoto), Kitabeppu, Yu (Sendai), Kumagai, Takashi (Kyoto), Kuwada, Kazumasa (Tokyo), Laschos, Vaios (Leipzig), Ledoux, Michel (Toulouse), Lierl, Janna (Bonn), Maas, Jan (Bonn), Mathieu, Pierre (Marseille), Melcher, Tai (Charlottesville), Milman, Emanuel (Haifa), Mondino, Andrea (Zürich), Philipowski, Robert (Luxembourg), Pinchover, Yehuda (Haifa), Popescu, Ionel (Atlanta), Saloff-Coste, Laurent (Ithaca), Savare, Giuseppe (Pavia), Schmidt, Marcel (Jena), Shioya, Takashi (Sendai), Slowik, Martin (Berlin), Sturm, Karl-Theodor (Bonn), Thalmaier, Anton (Luxembourg), Woess, Wolfgang (Graz)

Workshop 1322

26.05. – 01.06.2013 **Complex Algebraic Geometry**

Organizers: Fabrizio Catanese, Bayreuth
Christopher Hacon, Salt Lake City
Yujiro Kawamata, Tokyo
Bernd Siebert, Hamburg

Abstract

The workshop focused on several topics, classical and modern. The classification theory of projective and Kähler varieties played a central role. Chow and Hilbert schemes, GIT limits, stability, moduli spaces, were another direction which was present. The action of the absolute Galois group on moduli spaces and on the topology and Hodge structure of varieties was another theme. Finally, different approaches to moduli spaces of curves with symmetries were presented. In spite of the title of the conference, also characteristic p methods and problems were exposed.

Participants

Andreatta, Marco (Povo), Bauer-Catanese, Ingrid (Bayreuth), Beauville, Arnaud (Nice), Böhning, Christian (Hamburg), Campana, Frédéric (Vandoeuvre-les-Nancy), Cascini, Paolo (London), Catanese, Fabrizio (Bayreuth), Ciliberto, Ciro (Roma), Debarre, Olivier (Paris), De Poi, Pietro (Udine), di Cerbo, Gabriele (Princeton), Dolgachev, Igor (Ann Arbor), Dorsch, Tobias (Bayreuth), Ein, Lawrence (Chicago), Frapporti, Davide (Bayreuth), Gleissner, Christian (Bayreuth), Gongyo, Yoshinori (Tokyo), Graf, Patrick (Freiburg), Greb, Daniel (Bochum), Hacon, Christopher D. (Salt Lake City), Huybrechts, Daniel (Bonn), Hwang, Jun-Muk (Seoul), Ishii, Shihoko (Tokyo), Katzarkov, Ludmil (Wien), Kawamata, Yujiro (Tokyo), Kebekus, Stefan (Freiburg), Kirschner, Tim (Bayreuth), Kovács, Sándor J. (Seattle), Krug, Sebastian (Hamburg), Kulikov, Viktor S. (Moscow), Lee, Yongnam (Daejeon), Lelli-Chiesa, Margherita (Berlin), Li, Binru (Bayreuth), Liu, Wenfei (Bielefeld), Lönne, Michael (Hannover), Looijenga, Eduard J. N. (Utrecht), McKernan, James (Cambridge), Mukai, Shigeru (Kyoto), Oguiso, Keiji (Osaka), Okawa, Shinnosuke (Osaka), Perroni, Fabio (Trieste), Peternell, Thomas (Bayreuth), Rollenske, Sönke (Bielefeld), Schreieder, Stefan (Bonn), Siebert, Bernd (Hamburg), Sosna, Pawel (Hamburg), Vakil, Ravi (Stanford), Wandel, Malte (Hannover), Weigl, Sascha (Bayreuth), Xu, Chenyang (Salt Lake City), Yasuda, Takehiko (Osaka), Zuo, Kang (Mainz)

Workshop 1323

02.06. – 08.06.2013 **Geometric Structures in Group Theory**

Organizers: Martin Bridson, Oxford
Linus Kramer, Münster
Bertrand Remy, Villeurbanne
Karen Vogtmann, Ithaca

Abstract

The overall theme of the conference was geometric group theory, interpreted quite broadly. In general, geometric group theory seeks to understand algebraic properties of groups by studying their actions on spaces with various topological and geometric properties; in particular these spaces must have enough structure-preserving symmetry to admit interesting group actions. Although traditionally geometric group theorists have focused on finitely generated (and even finitely presented) countable discrete groups, the techniques that have been developed are now applied to more general groups, such as Lie groups and Kac-Moody groups, and although metric properties of the spaces have played a key role in geometric group theory, other structure such as complex or projective structures and measure-theoretic structures are being used more and more frequently.

Participants

Arzhantseva, Goulnara N. (Wien), Bartels, Arthur (Münster), Bartholdi, Laurent (Göttingen), Bowditch, Brian H. (Coventry), Bridson, Martin R. (Oxford), Bux, Kai-Uwe (Bielefeld), Calegari, Danny (Chicago), Caprace, Pierre-Emmanuel (Louvain-la-Neuve), Charney, Ruth (Waltham), Dahmani, Francois (Saint-Martin-d'Heres), Delzant, Thomas C. (Strasbourg), Dymara, Jan (Wroclaw), Feighn, Mark E. (Newark), Fujiwara, Koji (Kyoto), Gaboriau, Damien (Lyon), Groves, Daniel (Chicago), Guirardel, Vincent (Toulouse), Haettel, Thomas (Bonn), Hamenstädt, Ursula (Bonn), Handel, Michael (New York), Hensel, Sebastian (Chicago), Hilion, Arnaud (Marseille), Horbez, Camille (Rennes), Howie, James (Edinburgh), Januszkiewicz, Tadeusz (Warszawa), Kielak, Dawid (Bonn), Köhl, Ralf (Gießen), Kramer, Linus (Münster), Kropholler, Peter H. (Southampton), Lamy, Stéphane (Toulouse), Leary, Ian J. (Southampton), Leuzinger, Enrico (Karlsruhe), Levitt, Gilbert (Caen), Lück, Wolfgang (Bonn), Lustig, Martin (Marseille), Marquis, Timothee (Louvain-la-Neuve), Mozes, Shahar (Jerusalem), Neumann, Walter David (New York), Osin, Denis (Nashville), Petrunin, Anton (University Park), Przytycki, Piotr (Warszawa), Reid, Alan W. (Austin), Remy, Bertrand (Villeurbanne), Schwer, Petra N. (Münster), Sela, Zlil (Jerusalem), Swiatkowski, Jacek (Wroclaw), Thomas, Anne (Sydney), Varghese, Olga (Münster), Vogtmann, Karen L. (Ithaca), Weitze-Schmithüsen, Gabriela (Karlsruhe), Witzel, Stefan (Münster), Wortman, Kevin (Salt Lake City)

Workshop 1324

09.06. – 15.06.2013 **Hyperbolic Techniques for Phase Dynamics**

Organizers: Rinaldo M. Colombo, Brescia
Philippe G. LeFloch, Paris
Christian Rohde, Stuttgart

Abstract

The progress in the theory of hyperbolic conservation laws has always been and still is driven strongly by new fields of applications. The workshop addressed aspects of modelling, analysis and numerics for fundamental problems at the interface between hyperbolic evolution and the emerging mathematical theories of complex multiphasic materials. This includes problems in fluid and solid mechanics but also very recent applications in areas like swarm and traffic modelling.

Participants

Amadori, Debora (loc. Coppito, L'Aquila (AQ)), Amorim, Paulo (Rio de Janeiro, RJ -), Andreianov, Boris (Besancon), Bedjaoui, Nabil (Saint-Quentin), Bianchini, Stefano (Trieste), Borsche, Raul (Kaiserslautern), Boutin, Benjamin (Rennes), Chalons, Christophe (Paris), Colombo, Rinaldo M. (Brescia), Corli, Andrea (Ferrara), Daube, Johannes (Freiburg), De Lellis, Camillo (Zürich), Dreyer, Wolfgang (Berlin), Fan, Haitao (Washington), Freistühler, Heinrich (Konstanz), Frid, Hermano (Rio de Janeiro), Garavello, Mauro (Milano), Gasser, Ingenuin (Hamburg), Giesselmann, Jan (Berlin), Goatin, Paola (Sophia Antipolis), Godlewski, Edwige (Paris), Guerra, Graziano (Milano), Gwiazda, Piotr (Warsaw), Hantke, Maren (Magdeburg), Helluy, Philippe (Strasbourg), Hiltebrand, Andreas (Zürich), Kotschote, Matthias (Konstanz), Kraus, Christiane (Berlin), Kröner, Dietmar (Freiburg), Lattanzio, Corrado (loc. Coppito, L'Aquila (AQ)), Luckhaus, Stephan (Leipzig), Marcellini, Francesca (Milano), Mishra, Siddhartha (Zürich), Modena, Stefano (Trieste), Müller, Siegfried (Aachen), Nordli, Anders S. (Trondheim), Pares, Carlos (Malaga), Pop, Iuliu Sorin (Eindhoven), Rohde, Christian (Stuttgart), Rosini, Massimiliano D. (Warszawa), Rossi, Elena (Milano), Saleh, Khaled (Paris), Schleper, Veronika (Stuttgart), Seguin, Nicolas (Paris), Swierczewska-Gwiazda, Agnieszka (Warsaw), Turpault, Rodolphe (Nantes), Tzavaras, Athanasios E. (Heraklion)

Workshop 1325a

16.06. – 22.06.2013 **The Arithmetic of Fields**

Organizers: Moshe Jarden, Tel Aviv
Florian Pop, Philadelphia

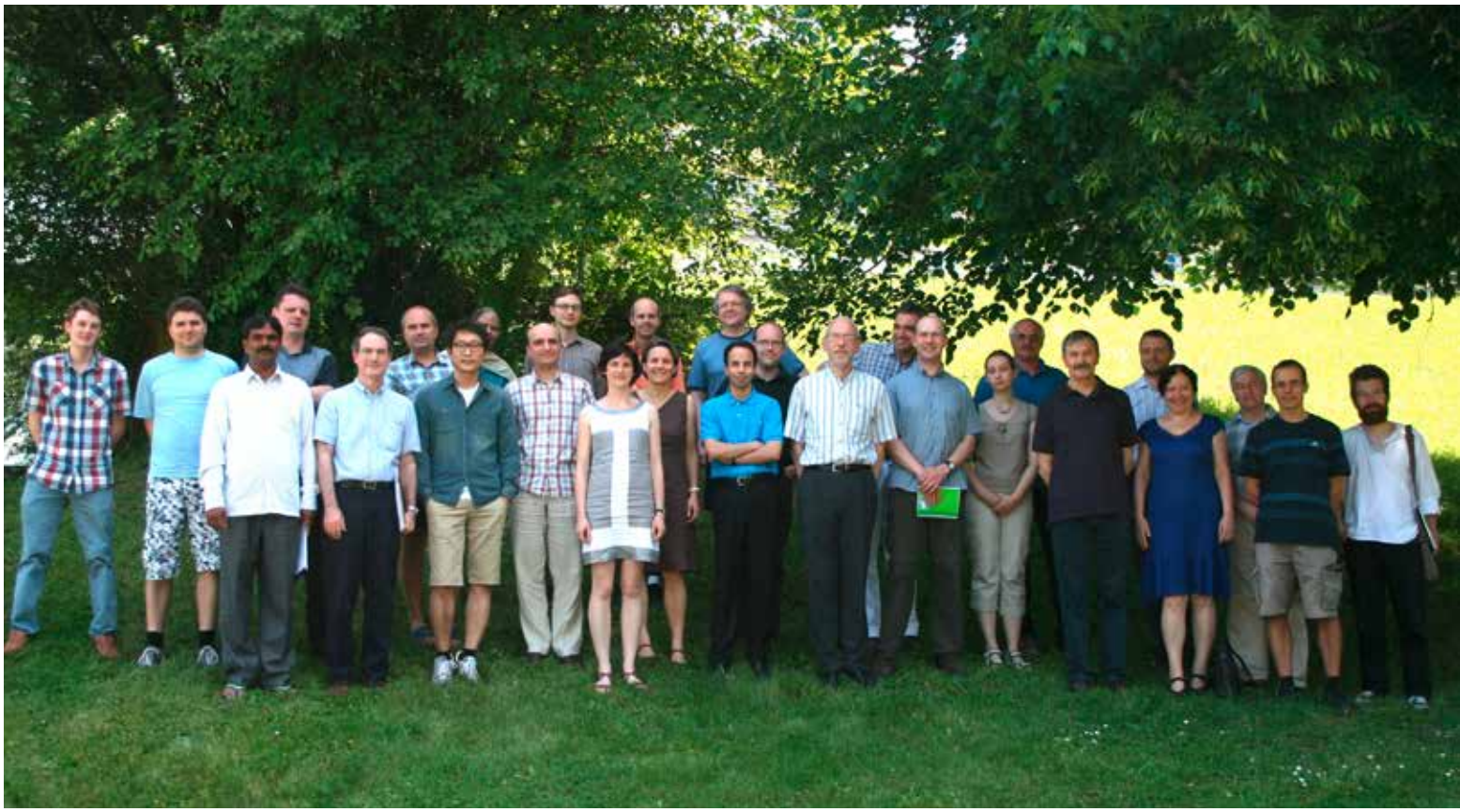
Abstract

Most of the talks during this workshop concentrated on the main theme of Field Arithmetic, namely Galois groups and the interplay with the arithmetic of the fields. Some of the talks had an arithmetical geometry flavour while others concentrated on valuation theory. Each morning two joint sessions together with the group of the workshop "Quadratic Forms an Linear Algebraic Groups" were organized, because the subjects were close enough. The afternoon sessions were separate.

Participants

Bary-Soroker, Lior (Tel Aviv), Ciperiani, Mirela (Austin), Dèbes, Pierre (Villeneuve d'Ascq), Efrat, Ido (Beer Sheva), Fehm, Arno (Konstanz), Geyer, Wulf-Dieter (Erlangen), Green, Barry William (Stellenbosch), Haran, Dan (Tel Aviv), Hartmann, Julia (Aachen), Holschbach, Armin (Heidelberg), Jarden, Moshe (Tel Aviv), Koenigsmann, Jochen (Oxford), Moret-Bailly, Laurent (Rennes), Obus, Andrew S. (New York), Paran, Elad (Tel Aviv), Petersen, Sebastian (Neubiberg), Poonen, Bjorn (Cambridge), Pop, Florian (Philadelphia), Prestel, Alexander (Konstanz), Razon, Aharon (Tel-Aviv), Silberstein, Aaron (Cambridge), Stevenson, Katherine F. (Northridge), Stix, Jakob (Heidelberg), Topaz, Adam (Philadelphia), Wickelgren, Kirsten (Cambridge), Zywina, David (Kingston)

Workshop 1325b



16.06. – 22.06.2013 **Quadratic Forms and Linear Algebraic Groups**

Organizers: Detlev Hoffmann, Dortmund
Alexander Merkurjev, Los Angeles
Jean-Pierre Tignol, Louvain-la-Neuve

Abstract

Topics discussed at the workshop "Quadratic Forms and Linear Algebraic Groups" included besides the algebraic theory of quadratic and Hermitian forms and their Witt groups several aspects of the theory of linear algebraic groups and homogeneous varieties, as well as some arithmetic aspects pertaining to the theory of quadratic forms over function fields or number fields.

Participants

Auel, Asher (New York), Baek, Sanghoon (Daejeon), Bayer-Fluckiger, Eva (Lausanne), Becher, Karim Johannes (Antwerpen), Calmes, Baptiste (Lens), Chernousov, Vladimir (Edmonton), Dolphin, Andrew (Louvain-la-Neuve), Gille, Philippe (Paris), Gille, Stefan (Edmonton), Grimm, David Maximilian (Lausanne), Hoffmann, Detlev (Dortmund), Karpenko, Nikita (Paris), Laghribi, Ahmed (Lens), Leep, David B. (Lexington), Merkurjev, Alexander S. (Los Angeles), Panin, Ivan A. (St. Petersburg), Parimala, Raman (Atlanta), Queguiner-Mathieu, Anne (Villetaneuse), Raczek, Melanie (Louvain-la-Neuve), Scully, Stephen (Nottingham), Stavrova, Anastasia (St. Petersburg), Suresh, Venapally (Atlanta), Tignol, Jean-Pierre (Louvain-la-Neuve), Unger, Thomas (Dublin), Vishik, Alexander (Nottingham), Zainoulline, Kirill (Ottawa)

Workshop 1326

23.06. – 29.06.2013 **Algebraic K-theory and Motivic Cohomology**

Organizers: Thomas Geisser, Nagoya
Annette Huber-Klawitter, Freiburg
Uwe Jannsen, Regensburg
Marc Levine, Essen

Abstract

Algebraic K-theory and motivic cohomology are strongly related tools providing a systematic way of producing invariants for algebraic or geometric structures. The definition and methods are taken from algebraic topology, but there have been particularly fruitful applications to problems of algebraic geometry, number theory or quadratic forms. 19 one-hour talks presented a wide range of latest results on the theory and its applications.

Participants

Asok, Aravind (Los Angeles), Banaszak, Grzegorz (Poznan), Bondarko, Mikhail (St. Petersburg), Bunke, Ulrich (Regensburg), Choudhury, Utsav (Zürich), Colliot-Thelene, Jean-Louis (Orsay), Cortinas, Guillermo (Buenos Aires), De Clercq, Charles (Paris), Deglise, Frederic (Lyon), Drew, Brad (Villetaneuse), Fasel, Jean (München), Forré, Patrick (Regensburg), Friedlander, Eric M. (Los Angeles), Garkusha, Grigory (Swansea), Geisser, Thomas (Nagoya), Grayson, Daniel R. (Urbana), Haesemeyer, Christian (Los Angeles), Hesselholt, Lars (Nagoya), Holmström, Andreas (Cambridge), Hornbostel, Jens (Wuppertal), Huber-Klawitter, Annette (Freiburg), Ivorra, Florian (Rennes), Jannsen, Uwe (Regensburg), Kahn, Bruno (Paris), Kelly, Shane (Essen), Kerz, Moritz (Regensburg), Levine, Marc (Essen), Lichtenbaum, Stephen (Providence), Morin, Baptiste (Toulouse), Nenashev, Alexander (Toronto), Panin, Ivan A. (St. Petersburg), Park, Jinhyun (Daejeon), Pirutka, Alena (Strasbourg), Podkopaev, Oleg (Essen), Riou, Joel (Orsay), Röndigs, Oliver (Osnabrück), Rosenschon, Andreas (München), Rülling, Kay (Berlin), Sato, Kanetomo (Tokyo), Schlichting, Marco (Coventry), Schmidt, Alexander (Heidelberg), Schoen, Chad (Durham), Semenov, Nikita (Mainz), Spitzweck, Markus (Osnabrück), Sugiyama, Rin (Essen), Tamme, Georg (Regensburg), Totaro, Burt (Cambridge), Vishik, Alexander (Nottingham), Weibel, Charles A. (New Brunswick), Wendt, Matthias (Freiburg), Zhong, Changlong (Ottawa)

Workshop 1327

30.06. – 06.07.2013 **Differentialgeometrie im Großen**

Organizers: Olivier Biquard, Paris
Simon Brendle, Stanford
Bernhard Leeb, München

Abstract

The meeting continued the biannual conference series 2Differentialgeometrie im Großen" at the MFO which was established in the 60's by Klingenberg and Chern. Global Riemannian geometry with its connections to topology, geometric group theory and geometric analysis remained an important focus of the conference. Special emphasis was given to Kähler manifolds, geometric flows and singular spaces of non-positive curvature.

Participants

Ammann, Bernd (Regensburg), Ballmann, Werner (Bonn), Bamler, Richard (Stanford), Bär, Christian (Potsdam), Barbot, Thierry (Avignon), Biquard, Olivier (Paris), Bowditch, Brian H. (Coventry), Brendle, Simon (Stanford), Cortés, Vicente (Hamburg), Daniel, Benoit (Vandoeuvre-les-Nancy), Dufour, Quentin (Paris), Dyckmanns, Malte (Hamburg), Frances, Charles (Orsay), Freibert, Marco (Hamburg), Fujiwara, Koji (Kyoto), Goldman, William Mark (College Park), Guichard, Olivier (Strasbourg), Haettel, Thomas (Bonn), Haslhofer, Robert (New York), Januszkiewicz, Tadeusz (Warszawa), Kapouleas, Nicolaos (Providence), Kröncke, Klaus (Potsdam), Lang, Urs (Zürich), Lange, Christian (Köln), Leeb, Bernhard (München), Lott, John (Berkeley), Lytchak, Alexander (Köln), Maubon, Julien (Vandoeuvre-les-Nancy), Neves, Andre (London), Panov, Dmitri (London), Petrunin, Anton (University Park), Porti, Joan (Bellaterra), Radeschi, Marco (Münster), Ramos-Cuevas, Carlos (München), Rollin, Yann (Nantes), Schnürer, Oliver C. (Konstanz), Schroeder, Viktor (Zürich), Stadler, Stephan (München), Sun, Song (London), Taimanov, Iskander A. (Novosibirsk), Thorbergsson, Gudlaugur (Köln), Tran, Tat Dat (Leipzig), Treib, Nicolaus (München), Tsui, Mao-Pei (Toledo), Tuschmann, Wilderich (Karlsruhe), Viaclovsky, Jeff A. (Madison), Wang, Yi (Stanford), Weil, Steffen (Zürich), Weiss, Hartmut (München), Wienhard, Anna Katharina (Heidelberg), Zuest, Roger (Fribourg)

Workshop 1328

07.07. – 13.07.2013 **Dynamische Systeme**

Organizers: Hakan Eliasson, Paris
Helmut W. Hofer, Princeton
Jean-Christophe Yoccoz, Paris

Abstract

This workshop continued the biannual series at Oberwolfach on Dynamical Systems that started as the "Moser-Zehnder meeting" in 1981. The main themes of the workshop are the new results and developments in the area of dynamical systems, in particular in Hamiltonian systems and symplectic geometry related to Hamiltonian dynamics. Highlights were the solution of a fifty year old problem in Arnold diffusion and a KAM-result on quasi-linear perturbations of the KdV-equation.

Participants

Abbas, Casim (East Lansing), Abbondandolo, Alberto (Pisa), Albers, Peter (Münster), Angenent, Sigurd B. (Madison), Arnaud, Marie-Claude (Avignon), Bangert, Victor (Freiburg), Berti, Massimiliano (Napoli), Bjerklöv, Kristian (Stockholm), Bramham, Barney (Princeton), Chenciner, Alain (Paris), Cheng, Chong-Qing (Nanjing), Eliasson, Hakan (Paris), Fathi, Albert (Lyon), Fayad, Bassam (Paris), Fish, Joel W. (Cambridge), Forni, Giovanni (College Park), Franks, John (Evanston), Fuchs, Urs (Münster), Gidea, Marian (Chicago), Ginzburg, Viktor L. (Santa Cruz), Guardia, Marcel (College Park), Gürel, Z. Basak (Orlando), Hein, Doris (Princeton), Hohloch, Sonja (Lausanne), Hryniewicz, Umberto (Rio de Janeiro), Kaloshin, Vadim Y. (College Park), Karaliolios, Nikolaos (Paris), Katok, Anatole B. (University Park), Katok, Svetlana (University Park), Khesin, Boris A. (Toronto), Knauf, Andreas (Erlangen), Knieper, Gerhard (Bochum), Le Calvez, Patrice (Paris), Levi, Mark (University Park), Marmi, Stefano (Pisa), Matheus, Carlos (Paris), Saprykina, Maria (Stockholm), Schwarz, Matthias (Leipzig), Siburg, Karl Friedrich (Dortmund), Siefring, Richard (Leipzig), Tabachnikov, Sergei (University Park), Ulcigrai, Corinna (Bristol), Wayne, Clarence Eugene (Boston), Wei, Qiaoling (Paris), Wysocki, Krzysztof (University Park), You, Jiangong (Nanjing), Young, Lai-Sang (New York), Zehnder, Eduard (Zürich), Zhang, Ke (Toronto), Zhou, Qi (Paris)

Workshop 1329

14.07. – 20.07.2013 **Explicit Methods in Number Theory**

Organizers: Karim Belabas, Bordeaux
Bjorn Poonen, Cambridge MA
Don B. Zagier, Bonn

Abstract

The goal of the meeting was to present new methods and results on concrete aspects of number theory. In several cases, this included algorithmic and experimental work, but the emphasis was on the implications for number theory. There were two 'mini-series' of two hours highlighting important recent developments: by Bilu, Parent and Rebolledo, on their partial solution to Serre's uniformity problem, and by Villegas on Hypergeometric Motives and their L-functions.

Participants

Balakrishnan, Jennifer S. (Cambridge), Belabas, Karim (Talence), Bennett, Michael A. (Vancouver), Bernstein, Daniel J. (Chicago), Beukers, Frits (Utrecht), Bhargava, Manjul (Princeton), Bilu, Yuri (Talence), Bringmann, Kathrin (Köln), Bruin, Nils (Burnaby), Calegari, Frank (Evanston), Cesnavicius, Kestutis (Cambridge), Cohen, Henri (Talence), Cremona, John E. (Coventry), de Smit, Bart (Leiden), Diem, Claus (Leipzig), Dokchitser, Tim (Bristol), Edixhoven, Bas (Leiden), Elkies, Noam D. (Cambridge), Gangl, Herbert (Durham), Gross, Benedict H. (Cambridge), Gunnells, Paul E. (Amherst), Helfgott, Harald (Paris), Kedlaya, Kiran S. (La Jolla), Klüners, Jürgen (Paderborn), Lenstra, Hendrik W. (Leiden), Mascot, Nicolas (Talence), Mellit, Anton (Trieste), Mestre, Jean-Francois (Paris), Molin, Pascal (Paris), Parent, Pierre (Talence), Park, Jennifer (Cambridge), Poonen, Bjorn (Cambridge), Rebolledo, Marusia (Aubiere), Roberts, David (Morris), Rodriguez-Villegas, Fernando (Trieste), Rubin, Karl (Irvine), Schoof, Rene (Roma), Siksek, Samir (Coventry), Silverberg, Alice (Irvine), Stevenhagen, Peter (Leiden), Stoll, Michael (Bayreuth), Sutherland, Andrew (Cambridge), Swinnerton-Dyer, Peter (Cambridge), Ulmer, Douglas (Atlanta), Venkatesh, Akshay (Stanford), Viray, Bianca (Providence), Vlasenko, Masha (Dublin), Voight, John (Burlington), Wang, Xiaoheng Jerry (Cambridge), Watkins, Mark J. (Sydney), Zagier, Don B. (Bonn), Zudilin, Wadim (Callaghan), Zywina, David (Princeton)

Workshop 1331

28.07. – 03.08.2013 **Multiscale and High-Dimensional Problems**

Organizers: Albert Cohen, Paris
Wolfgang Dahmen, Aachen
Ronald A. DeVore, College Station
Angela Kunoth, Paderborn

Abstract

High-dimensional problems appear naturally in various scientific areas. They cannot be solved by traditional numerical techniques, because of the so-called curse of dimensionality and therefore amplify the need for novel theoretical and computational approaches. The last decade has seen the emergence of several new computational methodologies. Their common features are the nonlinearity of the solution methods as well as the ability of separating solution characteristics living on different length scales. Perhaps the most prominent examples lie in adaptive grid solvers, tensor product, sparse grid and hyperbolic wavelet approximations and model reduction approaches. This workshop deepened the understanding of the underlying mathematical concepts and promoted the exchange of ideas emerging in various disciplines about the handling of multiscale and high-dimensional problems.

Participants

Andreev, Roman (College Park), Ayuso de Dios, Blanca (Bellaterra), Bachmayr, Markus (Aachen), Binev, Peter G. (Columbia), Bonizzoni, Francesca (Lausanne), Braess, Dietrich (Bochum), Canuto, Claudio (Torino), Chkifa, Abdellah (Paris), Cohen, Albert (Paris), Dahlke, Stephan (Marburg), Dahmen, Wolfgang (Aachen), De Mol, Christine (Bruxelles), DeVore, Ronald A. (College Station), Dyn, Nira (Tel Aviv), Fornasier, Massimo (Garching bei München), Grasedyck, Lars (Aachen), Grepl, Martin (Aachen), Hackbusch, Wolfgang (Leipzig), Hansen, Markus (Zürich), Harbrecht, Helmut (Basel), Kerkyacharian, Gerard (Paris), Kunoth, Angela (Paderborn), Lang, Annika (Zürich), Larsson, Stig (Göteborg), Lassila, Toni (Lausanne), Mirebeau, Jean-Marie (Paris), Mollet, Christian (Paderborn), Müller, Siegfried (Aachen), Nobile, Fabio (Lausanne), Ohlberger, Mario (Münster), Oseledets, Ivan (Moscow), Oswald, Peter (Bremen), Peters, Michael (Basel), Petrova, Guergana (College Station), Petrushev, Pencho P. (Columbia), Picard, Dominique (Paris), Popov, Bojan (College Station), Schneider, Reinhold (Berlin), Schwab, Christoph (Zürich), Stemick, Johannes (Aachen), Stevenson, Rob (Amsterdam), Süli, Endre (Oxford), Tadmor, Eitan (College Park), Urban, Karsten (Ulm), Welper, Gerrit (Aachen), Wojtaszczyk, Przemek (Warszawa), Wozniakowski, Henryk (Warszawa), Yserentant, Harry (Berlin)

Workshop 1332

04.08. – 10.08.2013 **Partial Differential Equations**

Organizers: Alice Chang, Princeton
Camillo De Lellis, Zürich
Reiner Schätzle, Tübingen

Abstract

The workshop dealt with partial differential equations in geometry and technical applications. The main topics were the combination of nonlinear partial differential equations and geometric problems, and fourth order equations in conformal geometry. A major part of the leading experts of partial differential equations with conformal invariance attended the workshop.

Participants

Ache, Antonio G. (Princeton), Bellettini, Costante (Princeton), Bögelein, Verena (Erlangen), Breiner, Christine (New York), Cabezas-Rivas, Esther (Münster), Case, Jeffrey (Princeton), Chang, Sun-Yung Alice (Princeton), De Lellis, Camillo (Zürich), de Philippis, Guido (Bonn), Duzaar, Frank (Erlangen), Ecker, Klaus (Berlin), Fang, Hao (Iowa City), Figalli, Alessio (Austin), Frehse, Jens (Bonn), Gonzalez Nogueras, Maria del Mar (Barcelona), Guan, Peng-Fei (Montreal), Gursky, Matthew John (Notre Dame), Habermann, Jens (Erlangen), Huisken, Gerhard (Tübingen), Ilmanen, Tom (Zürich), Keller, Laura (Münster), Kitagawa, Jun (Vancouver), Krömer, Stefan (Köln), Kuwert, Ernst (Freiburg), Li, Yanyan (New Brunswick), Liu, Jiakun (Wollongong), Maggi, Francesco (Austin), Malchiodi, Andrea (Trieste), Mantegazza, Carlo (Pisa), Mingione, Giuseppe R. (Parma), Mondino, Andrea (Zürich), Monti, Roberto (Padova), Naber, Aaron (Cambridge), Ndiaye, Cheikh B. (Tübingen), Nguyen, Luc (Princeton), Petrache, Mircea (Zürich), Rupflin, Melanie (Hannover), Schätzle, Reiner (Tübingen), Scheven, Christoph (Duisburg), Schnürer, Oliver C. (Konstanz), Simon, Miles (Magdeburg), Skorzinski, Florian (Tübingen), Spadaro, Emanuele Nunzio (Leipzig), Spolaor, Luca (Zürich), Struwe, Michael (Zürich), Tarantello, Gabriella (Roma), Topping, Peter (Coventry), Vittone, Davide (Padova), Wang, Guofang (Freiburg), Wickramasekera, Neshan (Cambridge), Yang, Paul C. (Princeton)

Workshop 1333

11.08. – 17.08.2013 **Nonlinear Waves and Dispersive Equations**

Organizers: Carlos E. Kenig, Chicago
Herbert Koch, Bonn
Daniel Tataru, Berkeley

Abstract

Nonlinear dispersive equations are models for nonlinear waves in a wide range of physical contexts. Mathematically they display an interplay between linear dispersion and nonlinear interactions, which can result in a wide range of outcomes from finite time blow-up to scattering. They are linked to many areas of mathematics and physics, ranging from integrable systems and harmonic analysis to fluid dynamics and general relativity. The workshop focussed on the analytic aspects and PDE aspects.

Participants

Banica, Manuela Valeria (Evry), Beceanu, Marius (Berkeley), Bejenaru, Ioan (La Jolla), Bulut, Aynur (Princeton), Cote, Raphael (Palaiseau), D'Ancona, Piero (Roma), Delort, Jean-Marc (Villetaneuse), Dodson, Benjamin (Berkeley), Donninger, Roland (Lausanne), Duyckaerts, Thomas (Villetaneuse), Germain, Pierre (New York), Graber, Jameson (Charlottesville), Grünrock, Axel (Düsseldorf), Gustafson, Stephen (Vancouver), Haberman, Boaz E. (Berkeley), Harrop-Griffiths, Benjamin (Berkeley), Herr, Sebastian (Bielefeld), Hundertmark, Dirk (Karlsruhe), Ifrim, Mihaela (Hamilton), Ionescu, Alexandru D. (Princeton), Ivanovici, Oana (Nice), Kalantarova, Habiba (Bonn), Kenig, Carlos E. (Chicago), Koch, Herbert (Bonn), Lawrie, Andrew (Berkeley), Lenzmann, Enno (Basel), Liu, Baoping (Chicago), Metcalfe, Jason (Chapel Hill), Mizumachi, Tetsu (Fukuoka), Munoz, Claudio (Orsay), Murphy, Jason C. (Los Angeles), Nakanishi, Kenji (Kyoto), Oh, Sung-Jin (Princeton), Oh, Tadahiro (Edinburgh), Pausader, Benoit (Villetaneuse), Planchon, Fabrice (Nice), Pocovnicu, Oana (Princeton), Pusateri, Fabio (Princeton), Racke, Reinhard (Konstanz), Smith, Paul (Berkeley), Sohinger, Vedran (Philadelphia), Staffilani, Gigliola (Cambridge), Steinerberger, Stefan (Bonn), Strunk, Nils Christoph (Bielefeld), Tataru, Daniel (Berkeley), Vega, Luis (Bilbao), Wu, Sijue (Ann Arbor)

Workshop 1334

18.08. – 24.08.2013 **Group Theory, Measure, and Asymptotic Invariants**

Organizers: Miklos Abert, Budapest
Damien Gaboriau, Lyon
Andreas Thom, Leipzig

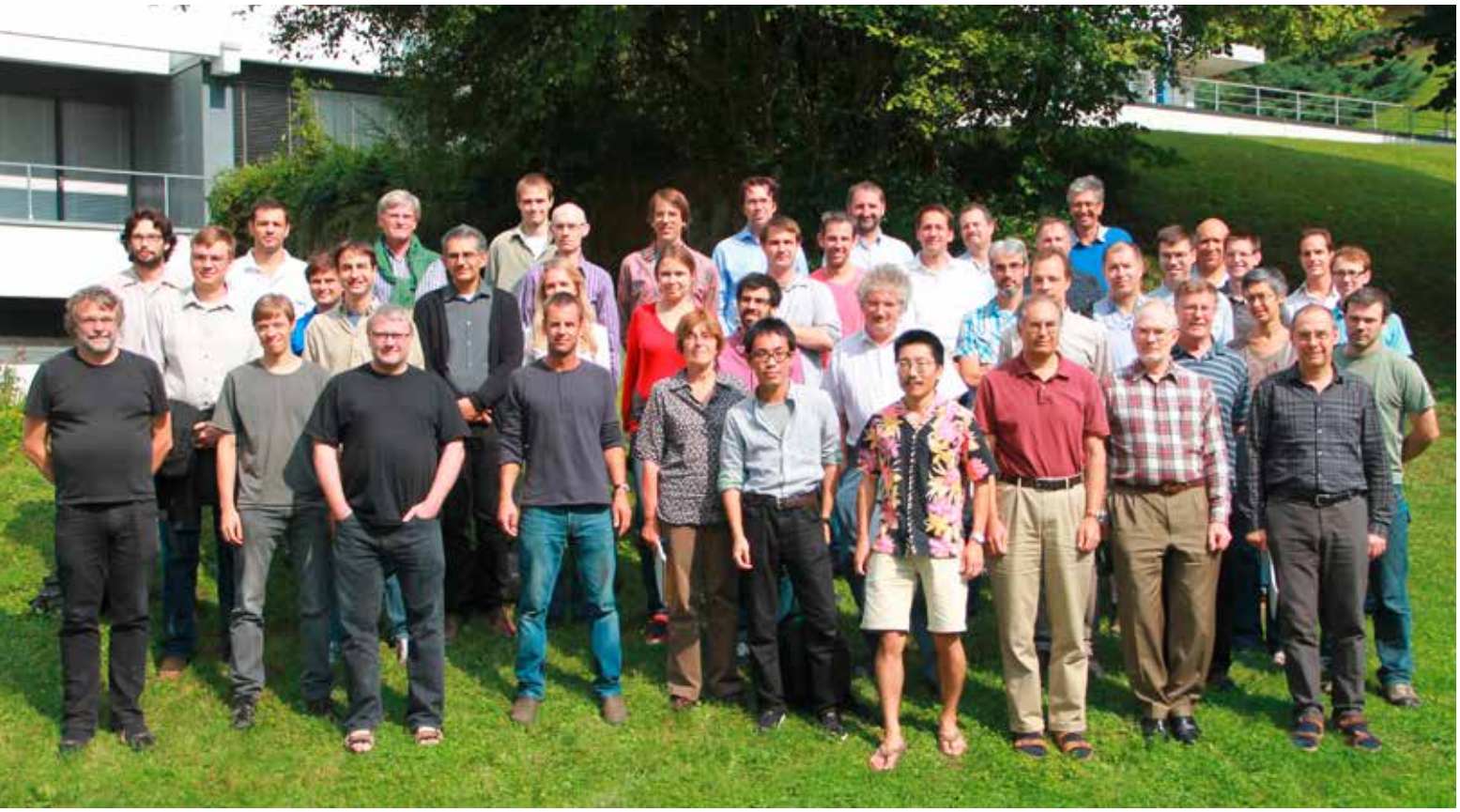
Abstract

The workshop aimed to study finitely generated groups and group actions using ergodic and measure theoretic methods, incorporating asymptotic invariants, such as $\ell 2$-invariants, the rank gradient, cost, torsion growth, entropy-type invariants and invariants coming from random walks and percolation theory. The participant body came from a wide range of areas: finite and infinite group theory, geometry, ergodic theory, graph theory, topology, probability theory, representation theory, von Neumann algebras and $\ell 2$-theory.

Participants

Abert, Miklos (Budapest), Alvarez, Aurelien (Orleans), Avni, Nir (Cambridge), Bader, Uri (Haifa), Beffara, Vincent (Lyon), Bekka, Bachir (Rennes), Bergeron, Nicolas (Paris), Bouljihad, Mohamed (Lyon), Bowen, Lewis (College Station), Carderi, Alessandro (Lyon), Elek, Gabor (Budapest), Ershov, Mikhail (Charlottesville), Finis, Tobias (Berlin), Gaboriau, Damien (Lyon), Gamm, Christoph (Leipzig), Gelander, Tsachik (Jerusalem), Grabowski, Lukasz (Oxford), Grigorchuk, Rostislav Ivan (College Station), Houdayer, Cyril (Lyon), Ioana, Adrian (La Jolla), Juschenko, Kate (Evanston), Kassabov, Martin (Ithaca), Kerr, David (College Station), Kun, Gabor (Budapest), Le Maitre, Francois (Lyon), Levit, Arie (Jerusalem), Li, Hanfeng (Buffalo), Lippner, Gabor (Cambridge), Löh, Clara (Regensburg), Lück, Wolfgang (Bonn), Lyons, Russell (Bloomington), Meiri, Chen (Chicago), Nikolov, Nikolay (Oxford), Osin, Denis (Nashville), Ozawa, Narutaka (Kyoto), Petersen, Henrik Densing (Lausanne), Peterson, Jesse D. (Nashville), Pichot, Mikael (Montreal), Pyber, Laszlo (Budapest), Sapir, Mark V. (Nashville), Sauer, Roman (Karlsruhe), Schick, Thomas (Göttingen), Schlage-Puchta, Jan-Christoph (Rostock), Szabo, Endre (Budapest), Szegedy, Balazs (Toronto), Szoke, Nora Gabriella (Budapest), Tessera, Romain A. (Lyon), Thom, Andreas B. (Leipzig), Timar, Adam (Budapest), Tóth, László Márton (Budapest), Tucker-Drob, Robin (Pasadena), Virag, Balint (Toronto), Wilson, John S. (Oxford)

Workshop 1335



25.08. – 31.08.2013 **C*-Algebren**

Organizers: Siegfried Echterhoff, Münster
Mikael Rordam, Copenhagen
Stefaan Vaes, Leuven
Dan-Virgil Voiculescu, Berkeley

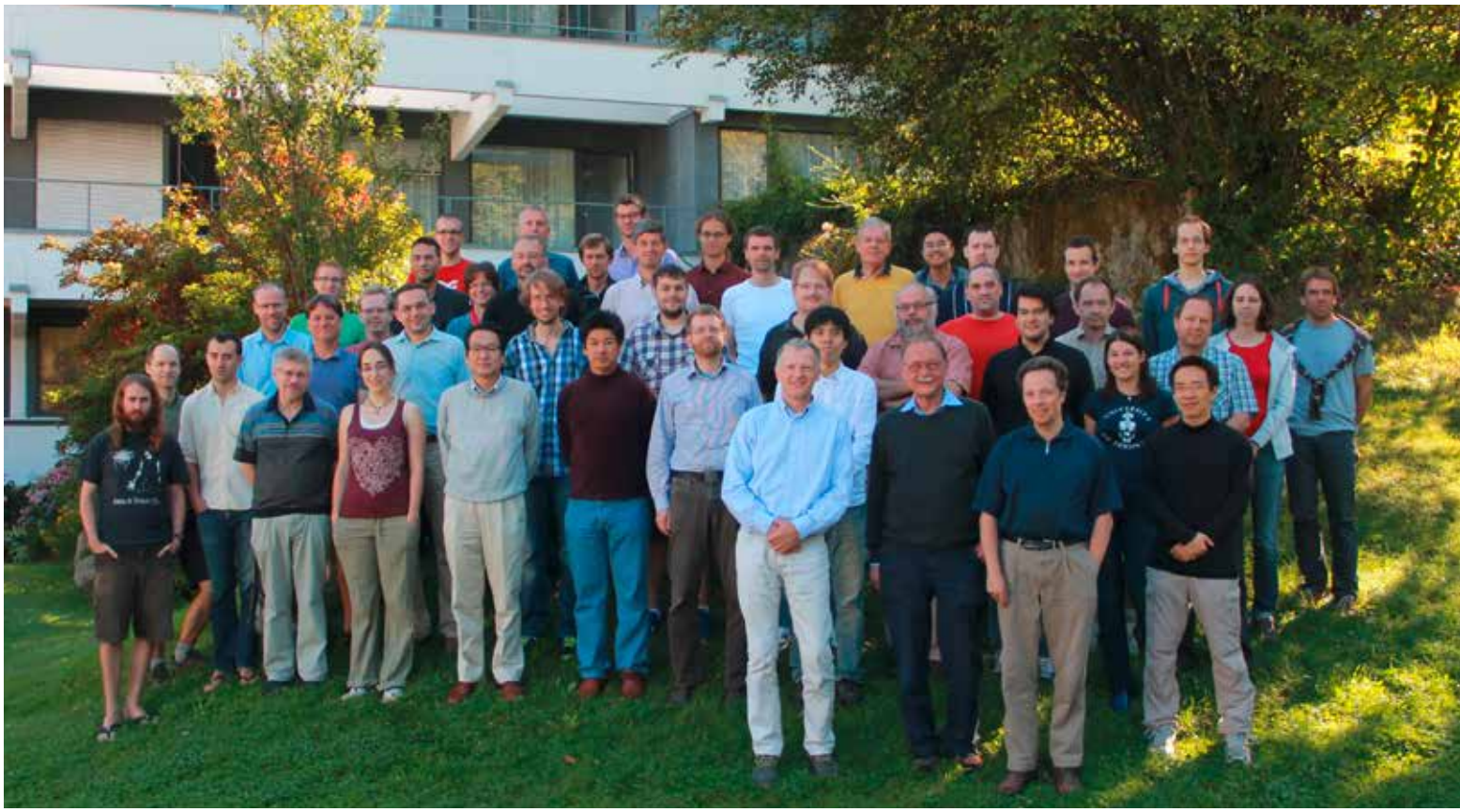
Abstract

C*-algebras play an important role in many modern areas of mathematics, like Noncommutative Geometry and Topology, Dynamical Systems, Harmonic Analysis and others. The workshop "C*-algebras" brought together leading experts from those areas in order to strengthen the cooperation and to keep the researchers informed about major developments in the field.

Participants

Anantharaman-Delaroche, Claire (Orleans), Bisch, Dietmar (Nashville), Brown, Nathaniel (University Park), Christensen, Erik (Kobenhavn), Cuntz, Joachim (Münster), Dabrowski, Yoann (Villeurbanne), Dadarlat, Marius (West Lafayette), Deprez, Steven (Copenhagen), Dykema, Ken J. (College Station), Echterhoff, Siegfried (Münster), Eilers, Soren (Copenhagen), Elliott, George A. (Toronto), Emerson, Heath (Victoria), Enders, Dominic (Münster), Exel, Ruy (Florianopolis), Farah, Ilijas (Toronto), Haagerup, Uffe (Copenhagen), Hayes, Benjamin (Los Angeles), Hirshberg, Ilan (Beer Sheva), Houdayer, Cyril (Lyon), Juschenko, Kate (Evanston), Kaad, Jens (Bonn), Kerr, David (College Station), Kirchberg, Eberhard (Berlin), Larsen, Nadia Slavila (Oslo), Li, Hanfeng (Buffalo), Li, Xin (Münster), Meyer, Ralf (Göttingen), Musat, Magdalena (Copenhagen), Nest, Ryszard (Kobenhavn), Nica, Bogdan (Göttingen), Oyono-Oyono, Herve (Metz), Ozawa, Narutaka (Kyoto), Peterson, Jesse D. (Nashville), Phillips, N. Christopher (Eugene), Putnam, Ian F. (Victoria), Raum, Sven (Heverlee), Rordam, Mikael (Kobenhavn), Shlyakhtenko, Dimitri (Los Angeles), Skandalis, Georges (Paris), Speicher, Roland (Saarbrücken), Thiel, Hannes (Münster), Thom, Andreas B. (Leipzig), Tikuisis, Aaron (Münster), Toms, Andrew (West Lafayette), Vaes, Stefaan (Leuven), Valette, Alain (Neuchatel), Vergnioux, Roland (Caen), Voiculescu, Dan (Berkeley), Voigt, Christian (Glasgow), White, Stuart (Glasgow), Winter, Wilhelm (Münster), Yalkinoglu, Bora (Strasbourg), Yamashita, Makoto (Tokyo)

Workshop 1336



01.09. – 07.09.2013 **Matrix Factorizations in Algebra, Geometry, and Physics**

Organizers: Ragnar-Olaf Buchweitz, Toronto
Kentaro Hori, Kashiwa
Henning Krause, Bielefeld
Christoph Schweigert, Hamburg

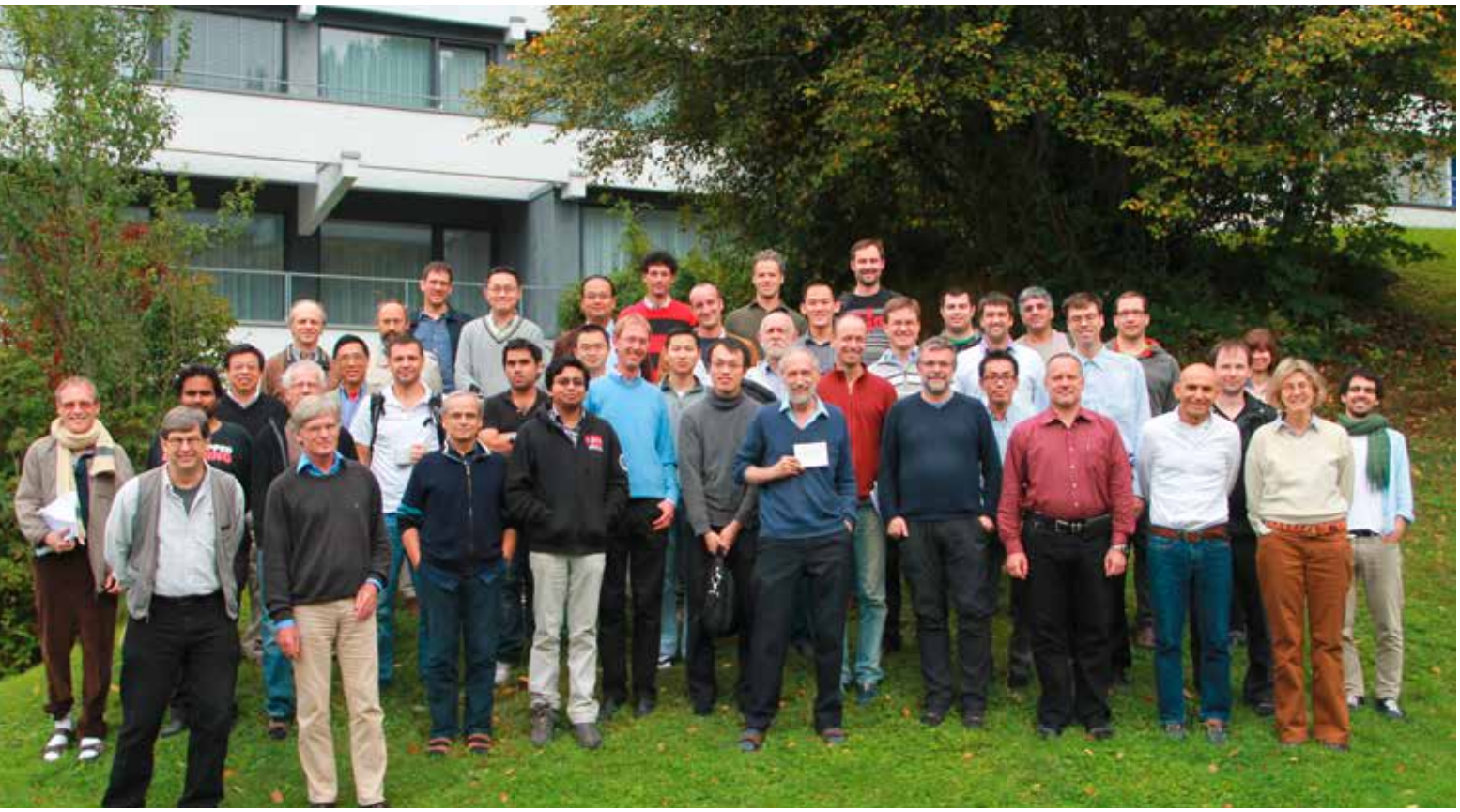
Abstract

Let W be a polynomial or power series in several variables, or, more generally, a nonzero element in some regular commutative ring. A matrix factorization of W consists of a pair of square matrices X and Y of the same size, with entries in the given ring, such that the matrix product XY is W multiplied by the identity matrix. For example, if X is a matrix whose determinant is W and Y is its adjoint matrix, then (X, Y) is a matrix factorization of W. Such matrix factorizations are nowadays ubiquitous in several different fields in physics and mathematics, including String Theory, Commutative Algebra, Algebraic Geometry, both in its classical and its noncommutative version, Singularity Theory, Representation Theory, Topology, there in particular in Knot Theory. The workshop brought together leading researchers and young colleagues from the various input fields.

Participants

Ballard, Matthew R. (Columbia), Becker, Hanno (Bonn), Broomhead, Nathan (Hannover), Buchweitz, Ragnar-Olaf (Toronto), Burban, Igor (Köln), Burke, Jesse (Los Angeles), Carqueville, Nils (Stony Brook), Dao, Hailong (Lawrence), Dyckerhoff, Tobias (New Haven), Faber, Eleonore (Toronto), Haiden, Fabian (Wien), Hille, Lutz (Münster), Isik, Mehmet Umut (Wien), Iyama, Osamu (Nagoya), Jockers, Hans (Bonn), Kalck, Martin (Bielefeld), Kapranov, Mikhail (New Haven), Katzarkov, Ludmil (Wien), Kerner, Dmitry (Beer-Sheva), Knapp, Johanna (Wien), Krause, Henning (Bielefeld), Lazarev, Andrey (Leicester), Lazaroiu, Calin I. (Pohang), Lehn, Manfred (Mainz), Lenzing, Helmut (Paderborn), Lerche, Wolfgang (Geneve), Leuschke, Graham J. (Syracuse), Murfet, Daniel (Los Angeles), Pantev, Tony (Philadelphia), Perling, Markus (Bielefeld), Polishchuk, Alexander (Eugene), Recknagel, Andreas (London), Roggenkamp, Daniel (Heidelberg), Ros Camacho, Ana (Hamburg), Runkel, Ingo (Hamburg), Scheidegger, Emanuel (Freiburg), Schnürer, Olaf (Bonn), Schweigert, Christoph (Hamburg), Sharpe, Eric (Blacksburg), Shipman, Ian (Ann Arbor), Stevenson, Greg (Bielefeld), Stroppel, Catharina (Bonn), Takahashi, Atsushi (Osaka), Takahashi, Ryo (Nagoya), Thibault, Louis-Philippe (Toronto), Ueda, Kazushi (Osaka), van Straten, Duco (Mainz), Walker, Mark E. (Lincoln), Wemyss, Michael (Edinburgh), Yoshino, Yuji (Okayama)

Workshop 1337



08.09. – 14.09.2013 **Noncommutative Geometry**

Organizers: Alain Connes, Paris
Joachim Cuntz, Münster
Marc A. Rieffel, Berkeley
Guoliang Yu, College Station

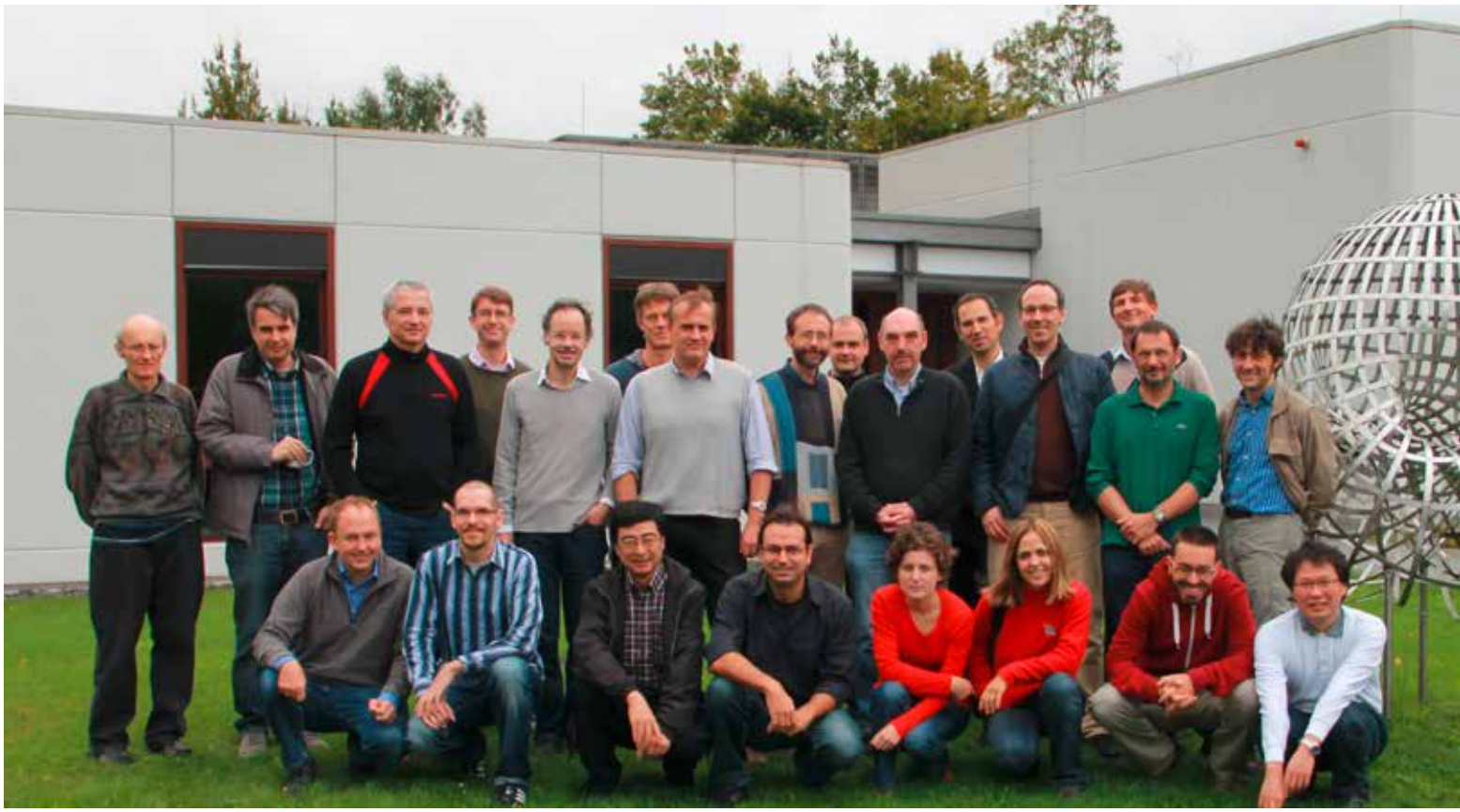
Abstract

Noncommutative Geometry applies ideas from geometry to mathematical structures determined by noncommuting variables. It is a highly interdisciplinary subject drawing ideas and methods from many areas of mathematics and physics. The workshop emphasized the connections of Noncommutative Geometry to number theory and ergodic theory. This reflects the fact that there are some very interesting recent developments in that direction, including the new role of cyclic homology in several aspects of number theory including regulators and L-functions.

Participants

Banerjee, Abhishek (Paris), Barlak, Selcuk (Münster), Bhowmick, Jyotishman (Oslo), Burnol, Jean-Francois (Villeneuve d'Ascq), Buss, Alcides (Münster), Carey, Alan (Canberra), Chakraborty, Sayan (Münster), Chung, Nhan-Phu (Leipzig), Cogdell, James W. (Columbus), Connes, Alain (Bures-sur-Yvette), Consani, Caterina (Baltimore), Cornelissen, Gunther (Utrecht), Cuntz, Joachim (Münster), Deninger, Christopher (Münster), Dykema, Ken J. (College Station), Echterhoff, Siegfried (Münster), Einsiedler, Manfred (Zürich), Gorokhovsky, Alexander (Boulder), Huang, Huichi (Münster), Junge, Marius (Urbana), Karoubi, Max (Paris), Khalkhali, Masoud (London), Landi, Giovanni (Trieste), Leichtnam, Eric (Paris), Li, Xin (Münster), Luef, Franz (Wien), Meyer, Ralf (Göttingen), Morava, Jack (Baltimore), Neshveyev, Sergey (Oslo), Nest, Ryszard (Kobenhavn), Nica, Bogdan (Göttingen), Pellarin, Federico (St. Etienne), Peterka, Mira (Lawrence), Pflaum, Markus (Boulder), Puschnigg, Michael (Marseille), Rangipour, Bahram (Fredericton), Strung, Karen (Münster), Szabo, Gabor (Münster), Tamme, Georg (Regensburg), Tang, Xiang (St. Louis), Timmermann, Thomas (Münster), van Erp, Erik (Hanover), van Suijlekom, Walter D. (Nijmegen), Vershik, Anatoli M. (St. Petersburg), Weibel, Charles A. (New Brunswick), Willett, Rufus E. (Honolulu), Winter, Wilhelm (Münster), Wu, Jianchao (Münster), Xie, Zhizhang (College Station), Xu, Quanhua (Besancon), Yalkinoglu, Bora (Strasbourg), Yamashita, Makoto (Tokyo), Yao, Yi-Jun (Shanghai), Yu, Guoliang (College Station)

Workshop 1338a



15.09. – 21.09.2013 **Lattice Differential Equations**

Organizers: Guillaume James, Grenoble
Dmitry Pelinovsky, Hamilton
Zoi Rapti, Urbana
Guido Schneider, Stuttgart

Abstract

The workshop focused on recent advances in the analysis of lattice differential equations such as discrete Klein-Gordon and nonlinear Schrödinger equations as well as the Fermi-Pasta-Ulam lattice. Lattice differential equations play an important role in emergent directions of modern science. These equations are fascinating subjects for mathematicians because they exhibit phenomena, which are not encountered in classical partial differential equations, on one hand, but they may present toy problems for understanding more complicated Hamiltonian differential equations, on the other hand.

Participants

Bambusi, Dario (Milano), Bauer, Roman (Stuttgart), Dawes, Jonathan (Bath), Demirkaya-Ozkaya, Aslihan (West Hartford), Feckan, Michal (Bratislava), Flach, Sergej (Auckland), Herrmann, Michael (Saarbrücken), Hoffman, Aaron H. (Needham), James, Guillaume (Grenoble), Kappeler, Thomas (Zürich), Kevrekidis, Panos (Amherst), Koukouloyannis, Vassilis (Thessaloniki), Matthies, Karsten (Bath), Mizumachi, Tetsu (Fukuoka), Paleari, Simone (Milano), Panayotaros, Panos (Mexico), Pelinovsky, Dmitry (Hamilton), Penati, Tiziano (Milano), Rapti, Zoi (Urbana), Schneider, Guido (Stuttgart), Stefanov, Atanas (Lawrence), Uecker, Hannes (Oldenburg), Yi, Yingfei (Atlanta), Zimmermann, Dominik (Stuttgart)

Workshop 1338b

15.09. – 21.09.2013 **High-Resolution Mathematical and Numerical Analysis of Involution-Constrained PDEs**

Organizers: Bruno Despres, Paris
Michael Dumbser, Trento
James Kamm, Albuquerque
Manuel Torrilhon, Aachen

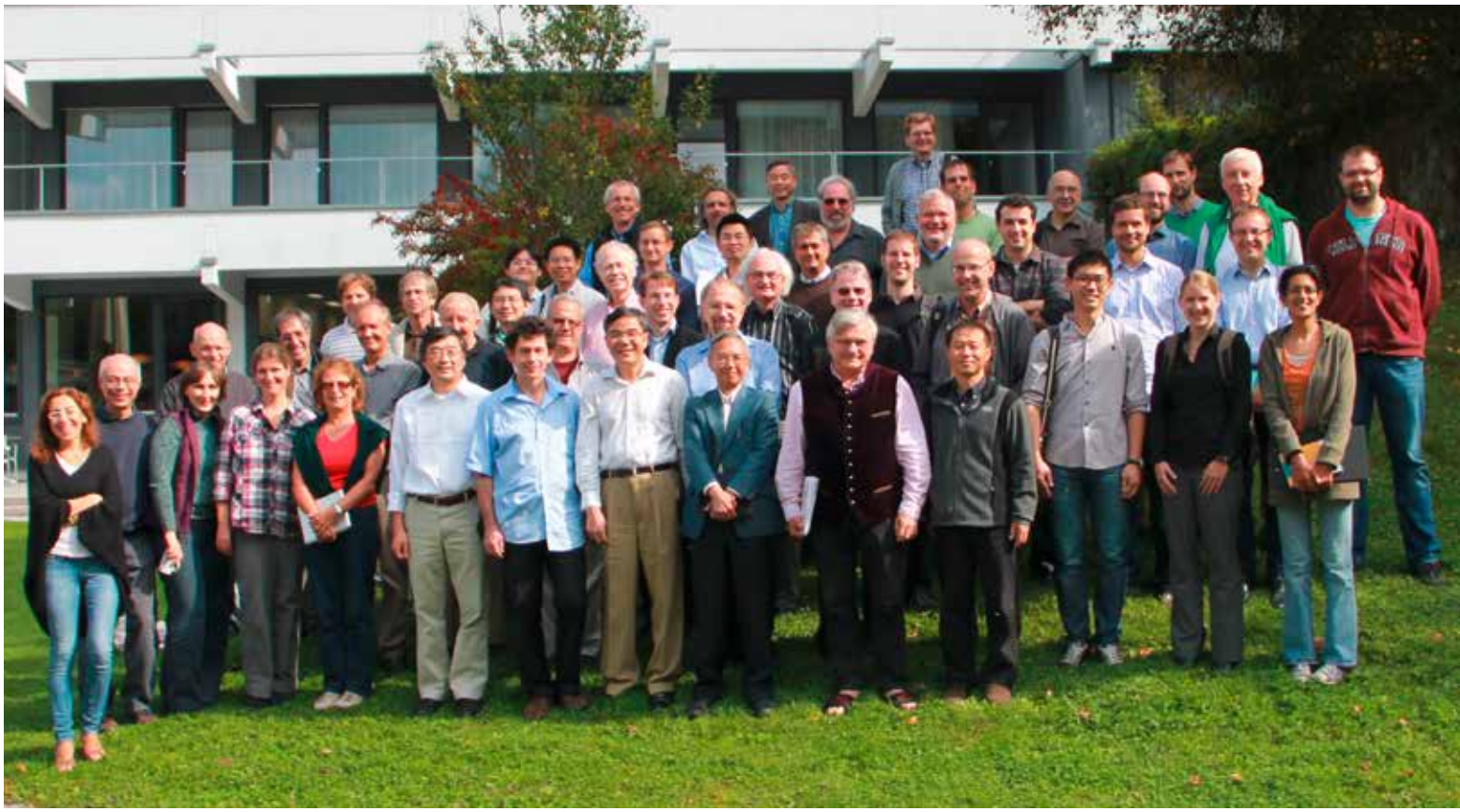
Abstract

Partial differential equations constrained by involutions provide the highest fidelity mathematical models for a large number of complex physical systems of fundamental interest in critical scientific and technological disciplines. The applications described by these models include electromagnetics, continuum dynamics of solid media, and general relativity. This workshop brought together pure and applied mathematicians to discuss current research that cuts across these various disciplines' boundaries. The presented material illuminated fundamental issues as well as evolving theoretical and algorithmic approaches for PDEs with involutions. The scope of the material covered was broad, and the discussions conducted during the workshop were lively and far-reaching.

Participants

Balsara, Dinshaw S. (Notre Dame), Bochev, Pavel B. (Albuquerque), Bossavit, Alain (Gif-sur-Yvette), Bouchut, Francois (Marne-la-Vallee), Christiansen, Snorre Harald (Oslo), Despres, Bruno (Paris), Dumbser, Michael (Trento), Franck, Emmanuel (Garching), Gavrilyuk, Sergey L. (Marseille), Gerritsma, Marc (Delft), Helzel, Christiane (Bochum), Heumann, Holger (New Brunswick), Kaeppeli, Roger (Zürich), Kamm, James R. (Albuquerque), Kluth, Gilles (Bruyere-le-Chatel), Nkonga, Boniface (Nice), Peshkov, Ilya (Montreal, Quebec), Ratnani, Ahmed (St Paul Lez Durance), Robinson, Allen C. (Albuquerque), Roe, Philip (Ann Arbor), Romenskiy, Evgeniy (Novosibirsk), Rossmanith, James A. (Ames), Shashkov, Mikhail (Los Alamos), Sonnendrücker, Eric (Garching), Torrilhon, Manuel (Aachen)

Workshop 1339



22.09. – 28.09.2013 **Statistical Inference for Complex Time Series Data**

Organizers: Rainer Dahlhaus, Heidelberg
Oliver Linton, Cambridge
Wei-Biao Wu, Chicago
Qiwei Yao, London

Abstract

During recent years the focus of scientific interest has turned from low dimensional stationary time series to nonstationary time series and high dimensional time series. In addition new methodological challenges are coming from high frequency finance where data are recorded and analyzed on a millisecond basis. The three topics "nonstationarity", "high dimensionality" and "high frequency" are on the forefront of present research in time series analysis. The topics also have some overlap in that there already exists work on the intersection of these three topics, e.g. on locally stationary diffusion models, on high dimensional covariance matrices for high frequency data, or on multivariate dynamic factor models for nonstationary processes. The workshop brought together researchers from time series analysis, nonparametric statistics, econometrics and empirical finance to work on these topics.

Participants

Aue, Alexander (Davis), Brockwell, Peter J. (Fort Collins), Chen, Rong (Piscataway), Dahlhaus, Rainer (Heidelberg), Davis, Richard A. (New York), Dehling, Herold (Bochum), Deistler, Manfred (Wien), Dette, Holger (Bochum), Doukhan, Paul (Cergy-Pontoise), Eichler, Michael (Maastricht), Fan, Jianqing (Princeton), Franke, Jürgen (Kaiserslautern), Fryzlewicz, Piotr (London), Gel, Yulia R. (Waterloo), Härdle, Wolfgang Karl (Berlin), Jacod, Jean (Paris), Jentsch, Carsten (Mannheim), Kirch, Claudia (Karlsruhe), Klüppelberg, Claudia (Garching), Kreiß, Jens-Peter (Braunschweig), Lam, Clifford (London), Leucht, Anne (Mannheim), Lindner, Alexander (Braunschweig), Linton, Oliver (Cambridge), Mammen, Enno (Mannheim), Mancino, Maria E. (Firenze), Mikosch, Thomas (Copenhagen), Moulines, Eric (Paris), Mykland, Per (Chicago), Neumann, Michael (Jena), Paparoditis, Efstathios (Nicosia), Podolskij, Mark (Heidelberg), Polonik, Wolfgang (Davis), Pourahmadi, Mohsen (College Station), Preuß, Philip (Bochum), Rao, Suhasini Subba (College Station), Reiß, Markus (Berlin), Roueff, Francois (Paris), Schmidt, Christian (Heidelberg), Spokoiny, Vladimir G. (Berlin), Stoffer, David S. (Pittsburgh), Tong, Howell (London), Tunyavetchakit, Sophon (Heidelberg), Vetter, Mathias (Bochum), Vogt, Michael (Cambridge), von Sachs, Rainer (Louvain-la-Neuve), Wang, Yazhen (Madison), Wu, Wei-Biao (Chicago), Xiao, Han (Piscataway), Yao, Qiwei (London), Zhou, Zhou (Toronto)

Workshop 1340

29.09. – 05.10.2013 **Uniform Distribution Theory and Applications**

Organizers: Michael Gnewuch, Kaiserslautern
Frances Y. Kuo, Sydney
Harald Niederreiter, Linz/Dhahran
Henryk Wozniakowski, New York/Warszawa

Abstract

The topics of the workshop were recent progress in the theory of uniform distribution theory (also known as discrepancy theory) and new developments in its applications in analysis, approximation theory, computer science, numerics, pseudo-randomness and stochastic simulation.

Participants

Aistleitner, Christoph (Kobe), Bilyk, Dmytro (Minneapolis), Brauchart, Johann S. (Sydney), Cools, Ronald (Heverlee), Dereich, Steffen (Münster), Dick, Josef (Sydney), Doerr, Benjamin (Palaiseau), Doerr, Carola (Palaiseau), Faure, Henri (Marseille), Gnewuch, Michael (Kaiserslautern), Goda, Takashi (Tokyo), Grabner, Peter J. (Graz), Hefter, Mario (Kaiserslautern), Heinrich, Stefan (Kaiserslautern), Herzwurm, Andre (Kaiserslautern), Hinrichs, Aicke (Rostock), Hofer, Roswitha (Linz), Joe, Stephen (Hamilton), Kritzer, Peter (Linz), Kühn, Thomas (Leipzig), Kuo, Frances Y. (Sydney), Lacey, Michael T. (Atlanta), Larcher, Gerhard (Linz), L'Ecuyer, Pierre (Montreal), Leobacher, Gunther (Linz), Li, Sangmeng (Münster), Mayer, Sebastian (Bonn), Müller-Gronbach, Thomas (Passau), Niederreiter, Harald (Linz), Novak, Erich (Jena), Nuyens, Dirk (Heverlee), Pillichshammer, Friedrich (Linz), Plaskota, Leszek (Warszawa), Potts, Daniel (Chemnitz), Ritter, Klaus (Kaiserslautern), Rudolf, Daniel (Jena), Schmid, Wolfgang Christian (Salzburg), Sloan, Ian H. (Sydney), Steinerberger, Stefan (Bonn), Suzuki, Kousuke (Tokyo), Temlyakov, Vladimir N. (Columbia), Tezuka, Shu (Fukuoka), Tichy, Robert F. (Graz), Totik, Vilmos (Tampa), Travaglini, Giancarlo (Milano), Viazovska, Maryna (Bonn), Wasilkowski, Grzegorz W. (Lexington), Weimar, Markus (Marburg), Winterhof, Arne (Linz), Womersley, Robert S. (Sydney), Wozniakowski, Henryk (New York)

Workshop 1343

20.10. – 26.10.2013 **Analytic Number Theory**

Organizers: Jörg Brüdern, Göttingen
Hugh L. Montgomery, Ann Arbor
Robert C. Vaughan, University Park
Trevor D. Wooley, Bristol

Abstract

Analytic number theory is on the roll for quite some time now, with spectacular discoveries year after year. To mention just two examples, our understanding of differences between consecutive primes is now radically different from what we knew a decade ago, thanks to a cascade of important contributions initiated by Goldston-Yıldırım Pintz. The subject was taken to yet another level by Zhang, only very recently. The work of Wooley, still ongoing, on Vinogradov's mean value theorem also changed the landscape in the areas where it is applied. This workshop brought together world leaders and young talents to discuss developments in various branches of the subject.

Participants

Beck, Jozsef (Piscataway), Bilu, Yuri (Talence), Blomer, Valentin (Göttingen), Brandes, Julia (Bristol), Browning, Tim D. (Bristol), Brüdern, Jörg (Göttingen), Cojocaru, Alina Carmen (Chicago), Conrey, Brian (Palo Alto), de la Breteche, Regis (Paris), Dietmann, Rainer (Egham), Fiorilli, Daniel (Ann Arbor), Ford, Kevin (Urbana), Fouvry, Etienne (Orsay), Friedlander, John B. (Scarborough, Ontario), Goldston, Daniel A. (San Jose), Gonek, Steve (Rochester), Harper, Adam (Cambridge), Heath-Brown, Roger (Oxford), Helfgott, Harald (Paris), Kaczorowski, Jerzy (Poznan), Kawada, Koichi (Morioka), Konyagin, Sergei V. (Moscow), Koukoulopoulos, Dimitris (Montreal), Kumchev, Angel (Towson), Le Boudec, Pierre (Lausanne), Lester, Steve (Ramat Aviv, Tel Aviv), Magyar, Akos (Vancouver), Maier, Helmut (Ulm), Marmon, Oscar (Göttingen), Martin, Greg (Vancouver), Matomäki, Kaisa (Turku), Matthiesen, Lilian (Orsay), Maynard, James (Montreal (Quebec)), Montgomery, Hugh L. (Ann Arbor), Munshi, Ritabrata (Mumbai), Parsell, Scott T. (West Chester), Perelli, Alberto (Genova), Pierce, Lillian Beatrix (Bonn), Pintz, Janos (Budapest), Prendiville, Sean (Bristol), Radziwill, Maksym (Princeton), Rassias, Michail Th. (Zürich), Robert, Olivier (Saint-Etienne), Rudnick, Zeev (Tel Aviv), Salberger, Per (Göteborg), Shparlinski, Igor E. (Sydney), Soundararajan, Kannan (Stanford), Vaughan, Robert C. (University Park), Wooley, Trevor D. (Bristol), Xue, Boqing (Shanghai), Zhao, Lilu (Hefei)

Workshop 1344

27.10. – 02.11.2013 **Large Scale Stochastic Dynamics**

Organizers: Claudio Landim, Rio de Janeiro
Stefano Olla, Paris
Herbert Spohn, Garching

Abstract

In focus are interacting stochastic systems with many components, ranging from stochastic partial differential equations to discrete systems as interacting particles on a lattice moving through random jumps. More specifically one wants to understand the large scale behavior, large in spatial extent but also over long time spans, as entailed by the characterization of stationary measures, effective macroscopic evolution laws, transport of conserved fields, homogenization, self-similar structure and scaling, critical dynamics, dynamical phase transitions, metastability, large deviations, to mention only a few key items.

Participants

Avena, Luca (Berlin), Balázs, Márton (Bristol), Basile, Giada (Roma), Beltran Ramirez, Johel (San Miguel, Lima), Bernardin, Cédric (Nice), Bianchi, Alessandra (Padova), Bolthausen, Erwin (Zürich), Butz, Maximilian (Garching), Carvalho Goncalves, Ana Patricia (Rio de Janeiro), Chojecki, Tymoteusz (Lublin), den Hollander, Frank (Leiden), Deuschel, Jean Dominique (Berlin), Faggionato, Alessandra (Roma), Ferrari, Patrik (Bonn), Fribergh, Alexander (Toulouse), Fritz, József (Budapest), Frométa Fernández, Susana (Rio de Janeiro), Funaki, Tadahisa (Tokyo), Gaudilliere, Alexandre (Marseille), Giacomin, Giambattista (Paris), Grosskinsky, Stefan (Coventry), Iacobucci, Alessandra (Paris), Jara, Milton (Rio de Janeiro), Lacoin, Hubert (Paris), Landim, Claudio (Rio de Janeiro), Letizia, Viviana (Paris), Misturini, Ricardo (Rio de Janeiro), Nejjar, Peter (Bonn), Olla, Stefano (Paris), Saada, Ellen (Paris), Santos, Renato (Villeurbanne), Sasada, Makiko (Kohokuku), Schütz, Gunter M. (Jülich), Sethuraman, Sunder (Tucson), Simenhaus, Francois (Paris), Simon, Marielle (Lyon), Slowik, Martin (Berlin), Spohn, Herbert (Garching), Stoltz, Gabriel (Marne-la-Vallee), Teixeira, Augusto (Paris), Toninelli, Fabio (Lyon), Toth, Balint (Budapest), Tsunoda, Kenkichi (Tokyo), Valesin, Daniel (Vancouver), van Beijeren, Henk (Utrecht), Weiss, Thomas (München)

Workshop 1346

10.11. – 16.11.2013 **Design and Analysis of Infectious Disease Studies**

Organizers: Martin Eichner, Tübingen
Elizabeth Halloran, Seattle
Philip O'Neill, Nottingham

Abstract

Technological advances in recent years have led to the opportunity to routinely collect highly detailed data which can be used to improve our understanding and control of infectious disease spread. This in turn created a need for novel mathematical modelling and statistical analysis. This workshop was based around this broad area, and included two special focus topics, namely molecular typing data and networks.

Participants

Auranen, Kari (Helsinki), Ball, Frank G. (Nottingham), Becker, Niels (Canberra), Bootsma, Martin (Utrecht), Britton, Tom (Stockholm), Cassidy, Rosanna (Nottingham), Cooper, Ben (Bangkok), Dietz, Klaus (Tübingen), Eichner, Martin (Tübingen), Frost, Simon D.W. (Cambridge), Funk, Sebastian (London), Gibson, Gavin (Edinburgh), Goeyvaerts, Nele (Diepenbeek), Gomes, Gabriela M. (Oeiras), Halloran, M. Elizabeth (Seattle), Hens, Niel (Diepenbeek), Höhle, Michael (Stockholm), Ionides, Edward (Ann Arbor), Isham, Valerie S. (London), Keiding, Niels (Kobenhavn), Kenah, Eben E. (Gainesville), Kretzschmar, Mirjam (BA Bilthoven), Kypraios, Theodore (Nottingham), Leary, Chris (Geneseo), Longini, Ira M. (Gainesville), McBryde, Emma (Melbourne), McKinley, Trevelyan J. (Cambridge), Mollison, Denis (Musselburgh), Mostowy, Rafal (London), Nagelkerke, Nico J.D. (AL Ain), Neal, Peter (Lancaster), O'Neill, Philip D. (Nottingham), Pellis, Lorenzo (Coventry), Rasmussen, David (Durham), Roberts, Mick (Auckland), Santermans, Eva (Diepenbeek), Sattenspiel, Lisa (Columbia), Scalia-Tomba, Gianpaolo (Roma), Schwehm, Markus (Leinfelden), Spencer, Simon (Coventry), Stilianakis, Nikolaos (Ispra), Trapman, Pieter (Stockholm), van Boven, Michiel (Bilthoven), Volz, Erik M. (Ann Arbor), Wakefield, Jon (Seattle), Wallinga, Jacco (Bilthoven), Wilson, Daniel (Oxford), Worby, Colin (Boston), Ypma, Rolf (Cambridge)

Workshop 1347

17.11. – 23.11.2013 **Numerical Solution of PDE Eigenvalue Problems**

Organizers: Andrew Knyazev, Cambridge MA
Volker Mehrmann, Berlin
Jinchao Xu, University Park

Abstract

This workshop brought together researchers from many different areas of numerical analysis, scientific computing and application areas, ranging from quantum mechanics, acoustic field computation to material science, working on eigenvalue problems for partial differential equations. Major challenges and new research directions were identified and the interdisciplinary cooperation was strengthened through a very lively workshop with many discussions.

Participants

Bai, Zhaojun (Davis), Bank, Randolph E. (La Jolla), Beattie, Christopher (Blacksburg), Benner, Peter (Magdeburg), Benzi, Michele (Atlanta), Boffi, Daniele (Pavia), Brannick, James (University Park), Brenner, Susanne C. (Baton Rouge), Chen, Long (Irvine), Elman, Howard (College Park), Embree, Mark (Houston), Fattebert, Jean-Luc (Livermore), Gallistl, Dietmar (Berlin), Gedicke, Joscha (Baton Rouge), Graham, Ivan G. (Bath), Grasedyck, Lars (Aachen), Grubisic, Luka (Zagreb), Hackbusch, Wolfgang (Leipzig), Hiptmair, Ralf (Zürich), Hochstenbach, Michiel (Eindhoven), Hu, Jun (Beijing), Ipsen, Ilse C.F. (Raleigh), Kandler, Ute (Berlin), Knyazev, Andrew (Cambridge), Kressner, Daniel (Lausanne), Kürschner, Patrick (Magdeburg), Larson, Mats G. (Umea), Lin, Lin (Berkeley), Meerbergen, Karl (Heverlee), Mehrmann, Volker (Berlin), Miedlar, Agnieszka (Berlin), Mollet, Christian (Köln), Notay, Yvan (Bruxelles), Pasciak, Joseph E. (College Station), Plum, Michael (Karlsruhe), Roman, José E. (Valencia), Schedensack, Mira (Berlin), Schöberl, Joachim (Wien), Schröder, Christian (Berlin), Simoncini, Valeria (Bologna), Uschmajew, Andre (Lausanne), Voigt, Matthias (Magdeburg), Xu, Jinchao (University Park), Ye, Qiang (Lexington), Yserentant, Harry (Berlin), Zhang, Zhimin (Beijing), Zhou, Aihui (Beijing), Zikatanov, Ludmil (University Park), Zwaan, Ian (Eindhoven)

Workshop 1349

01.12. – 07.12.2013 **Classical and Quantum Mechanical Models of Many-Particle Systems**

Organizers: Anton Arnold, Wien
Eric Carlen, Piscataway
Laurent Desvillettes, Cachan

Abstract

This meeting was focused on recent results on the mathematical analysis of many-particle systems, both classical and quantum-mechanical in scaling regimes such that the methods of kinetic theory can be expected to apply. Thus, the Boltzmann equation is in many ways the central equation investigated in much of the research presented and discussed at this meeting, but the range of topics naturally extended from this center to include other non-linear partial differential and integro-differential equations, especially macroscopic/fluid-dynamical limits of kinetic equations modeling the dynamics of many-particle systems. A significant subset of the talks focused on propagation of chaos, and the validation and derivation of kinetic equations from underlying stochastic particle models in which there has been much progress and activity. Models were discussed with applications not only in physics, but also engineering, and mathematical biology.

Participants

Achleitner, Franz (Wien), Alonso, Ricardo J. (Houston), Arnold, Anton (Wien), Barbaro, Alethea (Cleveland), Bardos, Claude (Paris), Bobylev, Alexander W. (Karlstad), Brenier, Yann (Palaiseau), Canizo, José Alfredo (Birmingham), Carlen, Eric (Piscataway), Carles, Remi (Montpellier), Carrillo de la Plata, Jose Antonio (London), Carvalho, Maria C. (Lisboa), Degond, Pierre (London), Desvillettes, Laurent (Cachan), Dolbeault, Jean (Paris), Einav, Amit (Cambridge), Esposito, Raffaele (loc. Coppito, L'Aquila (AQ)), Fellner, Klemens (Graz), Filbet, Francis (Villeurbanne), Frouvelle, Amic (Paris), Gamba, Irene M. (Austin), Golse, Francois (Palaiseau), Guo, Yan (Providence), Hauray, Maxime (Marseille), Illner, Reinhard (Victoria), Jin, Shi (Madison), Jüngel, Ansgar (Wien), Kim, Chanwoo (Cambridge), Lasser, Caroline (Garching bei München), Liu, Tai-Ping (Stanford), Lods, Bertrand (Torino), Lorz, Alexander (Paris), Marahrens, Daniel (Leipzig), Marra, Rossana (Roma), Matthes, Daniel (Garching bei München), Mischler, Stéphane (Paris), Motsch, Sebastien (Tempe), Mouhot, Clement (Paris), Moussa, Ayman (Paris), Negulescu, Claudia (Toulouse), Niethammer, Barbara (Bonn), Otto, Felix (Leipzig), Pezzotti, Federica (Roma), Pulvirenti, Mario (Roma), Ricci, Valeria (Palermo), Salvarani, Francesco (Pavia), Schmeiser, Christian (Wien), Sonnendrücker, Eric (Garching), Strain, Robert (Philadelphia), Stürzer, Dominik (Wien), Toscani, Giuseppe (Pavia), Trescases, Ariane (Cachan), Wennberg, Bernt (Göteborg), Yu, Shih-Hsien (Singapore)

Workshop 1350

08.12. – 14.12.2013 **Cluster Algebras and Related Topics**

Organizers: Bernhard Keller, Paris
Bernard Leclerc, Caen
Jan Schröer, Bonn

Abstract

Cluster algebras are a class of commutative algebras introduced by Fomin and Zelevinsky in 2000. Their original purpose was to obtain a combinatorial approach to Lusztig's dual canonical bases of quantum groups and to total positivity. Since then numerous connections between other areas of mathematics have been discovered. The aim of this workshop was to further strengthen these connections and to develop interactions.

Participants

Baur, Karin (Graz), Berenstein, Arkady (Eugene), Brüstle, Thomas (Sherbrooke), Buan, Aslak Bakke (Trondheim), Cerulli, Giovanni (Bonn), Chapoton, Frederic (Villeurbanne), Davison, Ben (Lausanne), Di Francesco, Philippe (Urbana), Felikson, Anna (Durham), Fock, Vladimir V. (Strasbourg), Fomin, Sergey (Ann Arbor), Geiss, Christof (Mexico), Gekhtman, Michael (Notre Dame), Geuenich, Jan (Bonn), Holm, Thorsten (Hannover), Inoue, Rei (Chiba-Shi), Iyama, Osamu (Nagoya), Jorgensen, Peter (Newcastle upon Tyne), King, Alastair D. (Bath), Labardini-Fragoso, Daniel (Mexico), Ladkani, Sefi (Bonn), Lamberti, Lisa (Oxford), Lampe, Philipp (Bielefeld), Leclerc, Bernard (Caen), Lee, Kyungyong (Detroit), Marsh, Robert J. (Leeds), Morier-Genoud, Sophie (Paris), Muller, Gregory (Ann Arbor), Musiker, Gregg (Minneapolis), Nakanishi, Tomoki (Nagoya), Neitzke, Andrew (Austin), Plamondon, Pierre-Guy (Caen), Ponchon, Romain (Strasbourg), Qin, Fan (Strasbourg), Qiu, Yu (Trondheim), Reading, Nathan (Raleigh), Reiten, Idun (Trondheim), Retakh, Vladimir (Piscataway), Ricke, Charlotte (Bonn), Scherotzke, Sarah (Bonn), Schiffler, Ralf (Storrs), Schröer, Jan (Bonn), Shapiro, Michael (East Lansing), Soibelman, Yan (Manhattan), Thomas, Hugh (Fredericton), Thurston, Dylan (New York), Todorov, Gordana (Boston), Vainshtein, Alek (Haifa), van den Bergh, Michel (Diepenbeek), Williams, Harold (Berkeley), Williams, Lauren K. (Berkeley), Yakimov, Milen (Baton Rouge)

Workshop 1351

15.12. – 21.12.2013 **Material Theories**

Organizers: Antonio DeSimone, Trieste
Stephan Luckhaus, Leipzig
Lev Truskinovsky, Palaiseau

Abstract

The subject of this meeting was mathematical modeling of strongly interacting multi-particle systems that can be interpreted as advanced materials. The main emphasis was placed on contributions attempting to bridge the gap between discrete and continuum approaches, focusing on the multi-scale nature of physical phenomena and bringing new and nontrivial mathematics. The mathematical debates concentrated on nonlinear PDE, stochastic dynamical systems, optimal transportation, calculus of variations and large deviations theory.

Participants

Agostiniani, Virginia (Oxford), Alt, Hans Wilhelm (München), Arroyo, Marino (Barcelona), Audoly, Basile (Paris), Ball, John M. (Oxford), Bigoni, Davide (Trento), Bouchitté, Guy (La Garde), Boudaoud, Arezki (Paris), Brenier, Yann (Palaiseau), Cicconofri, Giancarlo (Trieste), Clement, Eric (Paris), DeSimone, Antonio (Trieste), Doering, Lukas (Leipzig), Dondl, Patrick W. (Durham), Duong, Manh Hong (Eindhoven), Francfort, Gilles (Brooklyn), Garroni, Adriana (Roma), Golovaty, Dmitry (Akron), Grabovsky, Yury (Philadelphia), Kitavtsev, Georgy (Leipzig), Kruzik, Martin (Prague), Le, Khanh Chau (Bochum), Lelievre, Tony (Marne-la-Vallee), Luckhaus, Stephan (Leipzig), Mielke, Alexander (Berlin), Müller, Ingo (Berlin), Ortiz, Michael (Pasadena), Otto, Felix (Leipzig), Peletier, Mark A. (Eindhoven), Perez-Reche, Francisco-Jose (Aberdeen), Preziosi, Luigi (Torino), Puglisi, Giuseppe (Bari), Recho, Pierre (Paris), Rosakis, Phoebus (Heraklion), Runa, Eris (Leipzig), Saccomandi, Giuseppe (Perugia), Salman, Oguz Umut (Milano), Schlichting, Andre (Bonn), Schmidt, Bernd (Augsburg), Smereka, Peter (Ann Arbor), Smyshlyaev, Valery P. (London), Theil, Florian (Coventry), Truskinovsky, Lev (Palaiseau), Vainchtein, Anna (Pittsburgh), van Meurs, Patrick J.P. (Eindhoven), Vitale, Guido (Saint-Martin d'Heres), Wohlgemuth, Jens (Leipzig), Yavari, Arash (Atlanta), Zanzotto, Giovanni (Padova), Zurlo, Giuseppe (Palaiseau)

2.4. Miniworkshops

Miniworkshop 1307a

10.02. – 16.02.2013 **Numerical Upscaling for Media with Deterministic and Stochastic Heterogeneity**

Organizers: Yalchin Efendiev, College Station
Oleg Iliev, Kaiserslautern
Panayot Vassilevski, Livermore

Abstract

The aim of this meeting was to provide a forum for an extensive discussion on the theoretical aspects and on the areas of application and validity of numerical upscaling approaches for heterogeneous problems with deterministic and stochastic coefficients. The discussions contributed to a better understanding of upscaling approaches for multiscale problems with stochastic coefficients, and for synergy between scientists coming to this topic from the area of deterministic multiscale problems and from the area of SPDE. Recent advanced results on upscaling approaches for deterministic multiscale problems were presented, well mixed with strong presentations on SDE and SPDE. The open problems in these areas were discussed, with emphasis on the case of stochastic coefficients brainstorming numerous numerical upscaling approaches. A number of young researchers were involved in the workshop, thus ensuring the continuity between the generations of researchers.

Participants

Albrecht, Felix (Münster), Brown, Donald (Jeddah), Chung, Eric T. (Shatin, Hong Kong), Efendiev, Yalchin (College Station), Hajibeygi, Hadi (Delft), Iliev, Oleg (Kaiserslautern), Litvinenko, Alexander (Braunschweig), Maday, Yvon (Paris), Malqvist, Axel (Uppsala), Nagapetyan, Tigran (Kaiserslautern), Presho, Michael P. (College Station), Ritter, Klaus (Kaiserslautern), Scheichl, Robert (Bath), Taralova, Vassilena (Kaiserslautern), Vassilevski, Panayot S. (Livermore), Willems, Jörg (Linz), Zikatanov, Ludmil (University Park)

Miniworkshop 1307b

10.02. – 16.02.2013 **The p-Laplacian Operator and Applications**

Organizers: Lars Diening, München
Peter Lindqvist, Trondheim
Bernd Kawohl, Köln

Abstract

There has been a surge of interest in the p-Laplacian in many different contexts from game theory to mechanics and image processing. The workshop brought together experts from many different schools of thinking. The main focus was to discuss their recent developments and to encourage an interdisciplinary exchange of knowledge.

Participants

Cianchi, Andrea (Firenze), De Pascale, Luigi (Pisa), Diening, Lars (München), Kawohl, Bernd (Köln), Kinnunen, Juha (Aalto), Krügel, Florian (Köln), Lindqvist, Peter (Trondheim), Mingione, Giuseppe R. (Parma), Nyström, Kaj (Uppsala), Rossi, Julio Daniel (Alicante), Sakaguchi, Shigeru (Sendai), Schuricht, Friedemann (Dresden), Schwarzacher, Sebastian (München), Takac, Peter (Rostock), Wang, Peiyong (Detroit), Yu, Yifeng (Irvine)

Miniworkshop 1307c

10.02. – 16.02.2013 **Stochastic Analysis for Poisson Point Processes: Malliavin Calculus, Wiener-Ito Chaos Expansions and Stochastic Geometry**

Organizers: Matthias Reitzner, Osnabrück
Giovanni Peccati, Luxembourg

Abstract

Malliavin calculus plays an important role in the stochastic analysis for Poisson point processes. This technique is tightly connected with chaotic expansions, that were introduced in the first half of the last century by Itô and Wiener. These techniques found an increasing number of applications, in particular in the field of stochastic geometry. This in turn inspired new research in stochastic analysis. Leading experts and young researchers of both fields met for a week for fruitful discussions and new cooperations.

Participants

Bourguin, Solesne (Luxembourg), Decreusefond, Laurent (Paris), Hug, Daniel (Karlsruhe), Lachieze-Rey, Raphael (Paris), Last, Günter (Karlsruhe), Marinucci, Domenico (Roma), Molchanov, Ilya S. (Bern), Peccati, Giovanni (Luxembourg), Penrose, Mathew (Bath), Podolskij, Mark (Heidelberg), Privault, Nicolas (Singapore), Reitzner, Matthias (Osnabrück), Schulte, Matthias (Osnabrück), Thäle, Christoph (Osnabrück), Utzet, Frederic (Bellaterra), Zuyev, Sergei (Göteborg)

Miniworkshop 1320a

12.05. – 18.05.2013 **Spherical Varieties and Automorphic Representations**

Organizers: Friedrich Knop, Erlangen
Yiannis Sakellaridis, Newark

Abstract

This workshop brought together, for the first time, experts on spherical varieties and experts on automorphic forms, in order to discuss subjects of common interest between the two fields. Spherical varieties have a very rich and deep structure, which leads one to attach certain root systems and, eventually, a "Langlands dual" group to them. This turns out to be important for automorphic forms, as it provides a (mostly conjectural) way to analyze periods of automorphic forms and related problems in local harmonic analysis.

Participants

Bravi, Paolo (Roma), Brion, Michel (Saint-Martin-d'Heres), Brumley, Farrell (Villetaneuse), Casselman, William (Vancouver), Cupit-Foutou, Stephanie (Bochum), Gan, Wee-Teck (Singapore), Gandini, Jacopo (Göttingen), Knop, Friedrich (Erlangen), Krötz, Bernhard J. (Paderborn), Lapid, Erez M. (Jerusalem), Mao, Zhengyu (Newark), Offen, Omer (Haifa), Pezzini, Guido (Erlangen), Prasad, Dipendra (Mumbai), Sakellaridis, Yiannis (Newark), Templier, Nicolas (Princeton), Van Steirteghem, Bart (Brooklyn)

Miniworkshop 1320b

12.05. – 18.05.2013 **Constructive Homological Algebra with Applications to Coherent Sheaves and Control Theory**

Organizers: Mohamed Barakat, Kaiserslautern
Thierry Coquand, Göteborg
Alban Quadrat, Gif-sur-Yvette

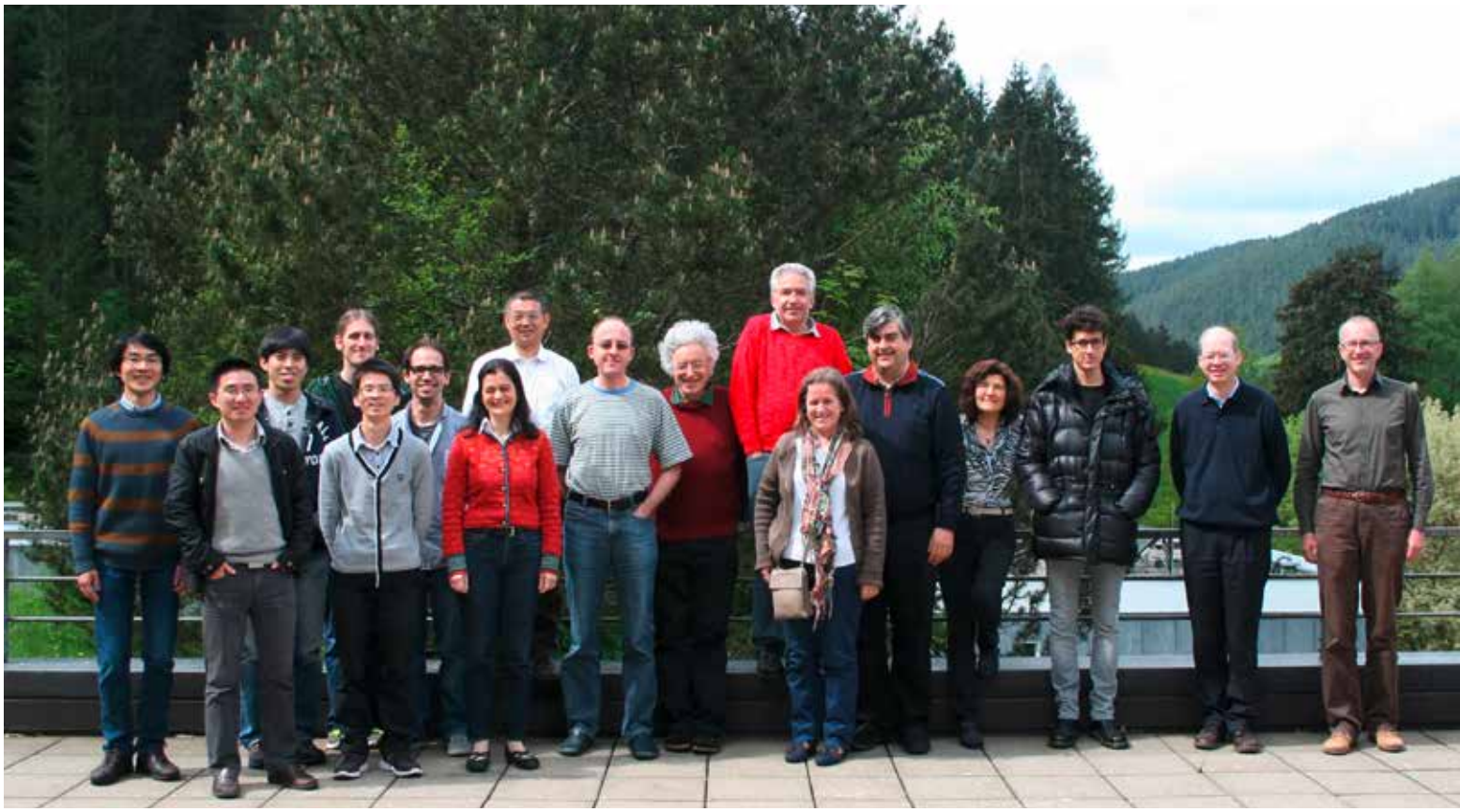
Abstract

The main objective of this mini-workshop is to bring together recent developments in constructive homological algebra. There, the current state already reached a level of generality which allows simultaneous application to diverse fields of applied and theoretical mathematics. In this workshop, we want to focus on simultaneous applications to system theory on the one side and to coherent sheaves and their cohomology on the other side. Surprisingly, these apparently remote fields share a considerable amount of common constructive methods. Bringing category theory and homological algebra to the computer leads to questions in logic and type theory. One goal of this workshop is to promote and enlarge this overlap.

Participants

Barakat, Mohamed (Kaiserslautern), Berkesch, Christine (Durham), Cluzeau, Thomas (Limoges), Coquand, Thierry (Göteborg), Decker, Wolfram (Kaiserslautern), Gutsche, Sebastian (Aachen), Lange-Hegermann, Markus (Aachen), Lombardi, Henri (Besancon), Mörtberg, Anders (Göteborg), Perling, Markus (Bielefeld), Posur, Sebastian (Aachen), Quadrat, Alban (Gif-sur-Yvette), Quitte, Claude (Chasseneuil), Robertz, Daniel (Aachen), Sergeraert, Francis (Saint-Martin-d'Heres), Smith, Gregory G. (Kingston, Ontario), Tête, Claire (Futuroscope Chasseneuil)

Miniworkshop 1320c



12.05. – 18.05.2013 **Localising and Tilting in Abelian and Triangulated Categories**

Organizers: Lidia Angeleri Hügel, Verona
Steffen Koenig, Stuttgart
Changchang Xi, Beijing

Abstract

The workshop brought together experts on localisation theory and tilting theory from different parts of mathematics with the aim of fully exploiting the power of some recent developments in so far rather independent contexts. The intensive exchange during the workshop was expected to lead to new and strengthened synergies and to new applications.

Participants

Alonso-Tarrio, Leovigildo (Santiago de Compostela), Angeleri Hügel, Lidia (Verona), Bazzoni, Silvana (Padova), Chen, Hongxing (Beijing), Chen, Xiao-Wu (Hefei), Jeremias-Lopez, Ana (Santiago de Compostela), Keller, Bernhard (Paris), König, Steffen (Stuttgart), Marks, Frederik (Stuttgart), Minamoto, Hiroyuki (Osaka), Nicolas, Pedro (Espinardo, MURCIA), Ranicki, Andrew A. (Edinburgh), Saorin, Manuel (Espinardo, MURCIA), Schwede, Stefan (Bonn), Takahashi, Ryo (Nagoya), Vitoria, Jorge (Bielefeld), Xi, Changchang (Beijing)

Miniworkshop 1330a

21.07. – 27.07.2013 **Direct and Inverse Spectral Theory of Almost Periodic Operators**

Organizers: David Damanik, Houston
Michael Goldstein, Toronto

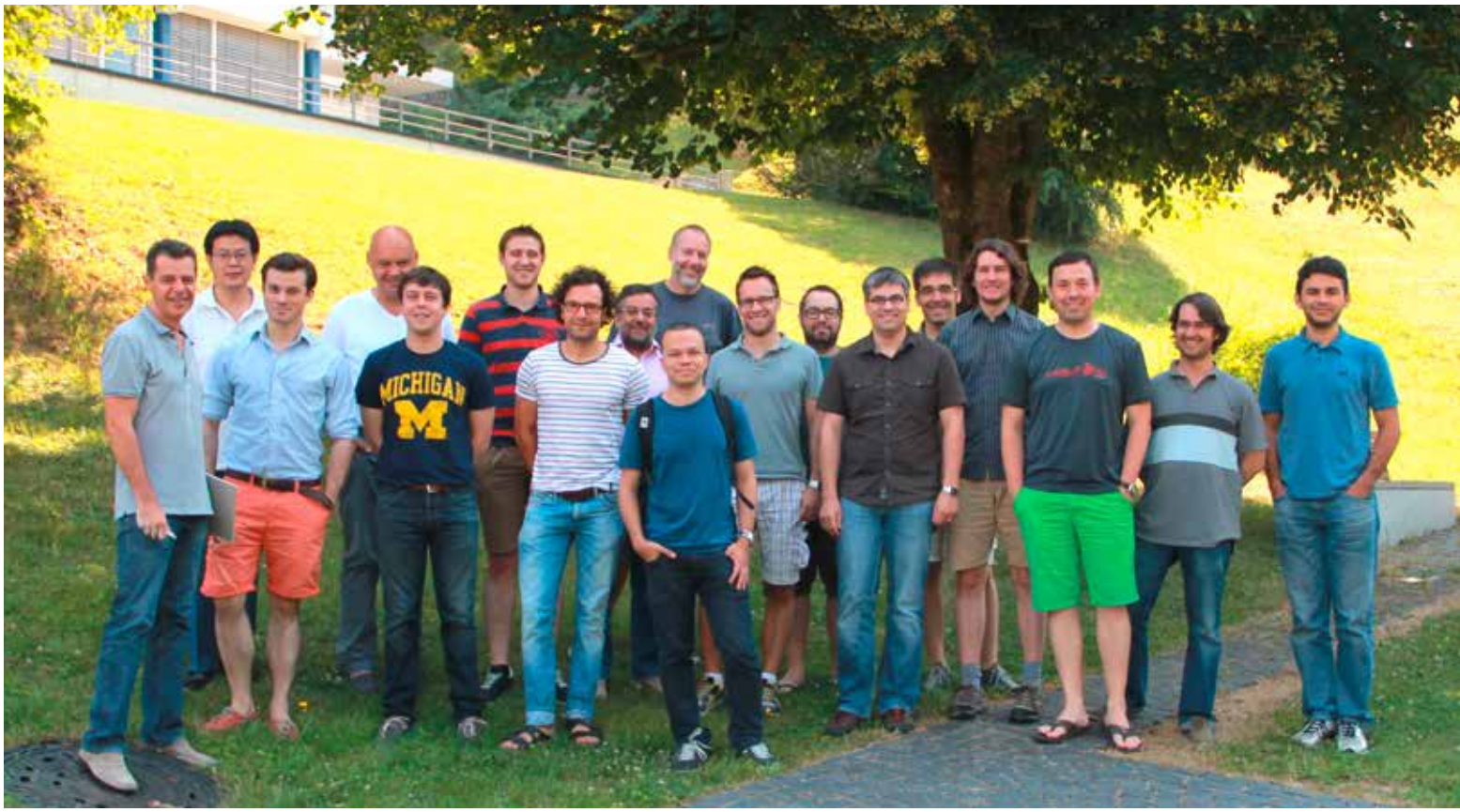
Abstract

This mini-workshop brought together researchers working on direct and inverse spectral theory for Schrödinger operators, Jacobi matrices, and related operators. The talks reported on recent work on these models and related ones, such as the Anderson model. The general area of almost periodic Schrödinger operators has seen spectacular progress in recent years. This is partly due to the infusion of new ideas from various areas and also the infusion of new talent in the form of promising junior researchers. Many of the recent advances in this area were presented during this meeting.

Participants

Binder, Ilia (Toronto), Damanik, David (Houston), Goldstein, Michael (Toronto), Karpeshina, Yulia (Birmingham), Klein, Silvius (Lisboa), Kotani, Shinichi (Hyougo), Krikorian, Raphael (Paris), Lukic, Milivoje (Houston), Metzger, Florian (Paris), Shamis, Mira (Princeton), Sodin, Alexander (Princeton), Stordal Christiansen, Jacob (Lund), Voda, Mircea (Toronto, Ontario), Wang, Yiqian (Nanjing), Yuditskii, Peter (Linz), Zinchenko, Maxim (Albuquerque)

Miniworkshop 1330b



21.07. – 27.07.2013 **The Willmore Functional and the Willmore Conjecture**

Organizers: Tobias Lamm, Karlsruhe
Jan Metzger, Potsdam
Andre Neves, London

Abstract

The Willmore functional evaluated on a surface immersed into Euclidean space is given by the L2-norm of its mean curvature. The interest for studying this functional comes from various directions. First, it arises in applications from biology and physics, where it is used to model surface tension in the Helfrich model for bilipid layers, or in General Relativity where it appears in Hawking's quasi-local mass. Second, the mathematical properties justify consideration of the Willmore functional in its own right. The Willmore functional is one of the most natural extrinsic curvature functionals for immersions. Its critical points solve a fourth order Euler-Lagrange equation, which has all minimal surfaces as solutions.

Participants

Bernard, Yann (Freiburg), Blatt, Simon (Karlsruhe), Kusner, Robert B. (Amherst), Kuwert, Ernst (Freiburg), Lamm, Tobias (Karlsruhe), Li, Yuxiang (Beijing), Marques, Fernando Coda (Rio de Janeiro), Metzger, Jan (Potsdam), Micallef, Mario J. (Coventry), Mondino, Andrea (Zürich), Müller, Reto (London), Neves, Andre (London), Nunes, Ivaldo (Rio de Janeiro), Riviere, Tristan (Zürich), Schulze, Felix (London), Sharp, Ben (London), Volkmann, Alexander (Golm)

Miniworkshop 1330c

21.07. – 27.07.2013 **New Crossroads between Mathematics and Field Theory**

Organizers: Romeo Brunetti, Povo
Christian Bär, Potsdam
Claudio Dappiaggi, Pavia
Klaus Fredenhagen, Hamburg

Abstract

In the last few years, it has been strongly emphasized the need to use new mathematical tools and structures which are not part of the traditional pool of expertise of the community working on the analysis of the mathematical and structural properties of classical and quantum field theory. Goal of the workshop has been to bring together some of the major experts in these topics to discuss the latest results and the new insights brought to field theory by techniques, such as microlocal analysis, infinite dimensional geometry and homological algebra.

Participants

Bär, Christian (Potsdam), Brouder, Christian (Paris), Brunetti, Romeo (Povo), Dafermos, Mihalis (Cambridge), Dappiaggi, Claudio (Pavia), Fewster, Christopher (Heslington, York), Fredenhagen, Klaus (Hamburg), Gerard, Christian (Orsay), Hack, Thomas-Paul (Genova), Hollands, Stefan (Cardiff), Lauridsen Ribeiro, Pedro (Santo André), Moretti, Valter (Povo), Pinamonti, Nicola (Genova), Rejzner, Katarzyna (Roma), Sanders, Jacobus Ambrosius (Chicago), Schenkel, Alexander (Wuppertal), Strohmaier, Alexander (Loughborough)

Miniworkshop 1345a

03.11. – 09.11.2013 **Quaternion Kähler Structures in Riemannian and Algebraic Geometry**

Organizers: Anna Fino, Torino
Uwe Semmelmann, Stuttgart
Jaroslaw Wisniewski, Warszawa
Frederik Witt, Münster

Abstract

Metrics of special holonomy are of central interest in both Riemannian and complex algebraic geometry. We focussed on an important classification problem of a particular type of special holonomy manifolds, namely compact quaternion-Kähler with positive scalar curvature (Salamon-LeBrun conjecture). In the language of algebraic geometry this corresponds to the classification of Fano contact manifolds. By bringing together leading experts in both fields this workshop pursued a two-fold goal: First, to revise old and to develop new strategies for proving the most central conjecture in the field of quaternionic Kähler geometry. Second, to introduce young researchers at PhD/PostDoc level to this interdisciplinary circle of ideas.

Participants

Amann, Manuel (Karlsruhe), Bielawski, Roger (Hannover), Buczynski, Jaroslaw (Warszawa), Campana, Frédéric (Vandoeuvre-les-Nancy), Cortés, Vicente (Hamburg), Dessai, Anand N. (Fribourg), Donten-Bury, Marysia (Warszawa), Fino, Anna Maria (Torino), Hwang, Jun-Muk (Seoul), Kebekus, Stefan (Freiburg), Moroianu, Andrei (Versailles), Semmelmann, Uwe (Stuttgart), Swann, Andrew (Aarhus), Weingart, Gregor (Cuernavaca), Wisniewski, Jaroslaw (Warszawa), Witt, Frederik (Münster)

Miniworkshop 1345b

03.09. – 09.11.2013

Inelastic and Non-equilibrium Material Behavior: from Atomistic Structure to Macroscopic Constitutive Relations

Organizers: Kaushik Dayal, Pittsburgh
Patrick Dondl, Garching
Celia Reina, Philadelphia

Abstract

The workshop brought together 15 scientists, which included leaders in the fields of mathematics (partial differential equations, statistical mechanics and calculus of variations) and mechanics (continuum mechanics, computational mechanics, microstructure and material science) as well as mid- and earlycareer participants. We addressed the themes of modeling crystal plasticity, crystallization and fracture, and non-equilibrium thermodynamics.

Participants

Au Yeung, Yuen (Garching), Banerjee, Amartya Sankar (Minneapolis), Chenchiah, Isaac Vikram (Bristol), Cicalese, Marco (München), Dayal, Kaushik (Pittsburgh), Dolzmann, Georg (Regensburg), Dondl, Patrick W. (Garching), James, Richard D. (Minneapolis), Marshall, Jason (Pittsburg,), Reina Romo, Celia (Philadelphia), Schmidt, Bernd (Augsburg), Theil, Florian (Coventry), Tsagkarogiannis, Dimitrios (Brighton), Zimmer, Johannes (Bath), Zwicknagl, Barbara (Bonn)

2.5. Arbeitsgemeinschaften

Arbeitsgemeinschaft 1314

31.03. – 05.04.2013 **Limits of Structures**
Organizers: Laszlo Lovasz, Budapest
Balazs Szegedy, Toronto

Abstract
The goal of the Arbeitsgemeinschaft was to review current progress in the study of very large structures. The main emphasis is on the analytic approach that considers large structures as approximations of infinite analytic objects. This approach enables one to study graphs, hypergraphs, permutations, subsets of groups and many other fundamental structures.

Participants
Abert, Miklos (Budapest), Alpeev, Andrey (St. Petersburg), Ambrus, Gergely (Budapest), Backhausz, Agnes (Budapest), Bowler, Nathan (Hamburg), Candela, Pablo (Paris), Carmesin, Johannes (Hamburg), Chervak, Ostap (Lviv), Chung, Nhan-Phu (Leipzig), Csikvari, Peter (Budapest), Csoka, Endre (Coventry), DeCorte, Evan (Delft), Deninger, Christopher (Münster), Elek, Gabor (Budapest), Freer, Cameron (Cambridge), Frenkel, Peter (Budapest), Gaboriau, Damien (Lyon), Glebov, Roman (Coventry), Gmeiner, Peter (Erlangen), Grzesik, Andrzej (Krakow), Gutman, Yonatan (Cambridge), Hladky, Jan (Coventry), Hosseini, Lucas (Paris), Huang, Hao (Princeton), Komjathy, Julia (Eindhoven), Kun, Gabor (Budapest), Lovász, László (Budapest), Lovász, László Miklós (Cambridge), Matschke, Benjamin (Bures-sur-Yvette), Mészáros, Viola (Szeged), Nesetril, Jaroslav (Praha), Ossona de Mendez, Patrice (Paris), Pete, Gabor (Budapest), Pikhurko, Oleg (Coventry), Reiher, Christian (Hamburg), Sengupta, Rik (Cambridge), Skerman, Fiona (Oxford), Szegedy, Balazs (Toronto), Thom, Andreas B. (Leipzig), Vena, Lluis (Toronto, Ontario), Virag, Balint (Toronto), Volec, Jan (Coventry), Zirnstein, Heinrich-Gregor (Leipzig)

Arbeitsgemeinschaft 1341

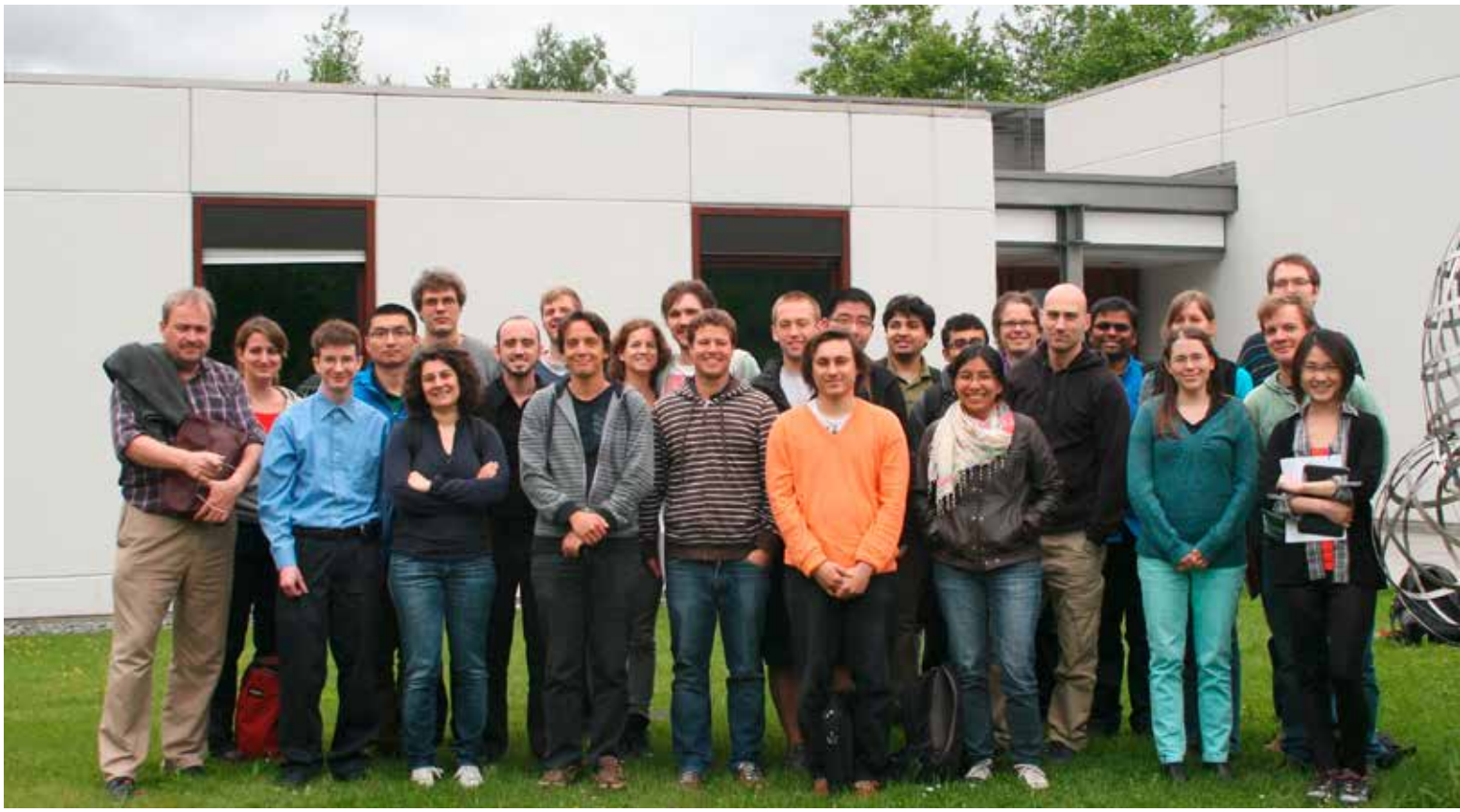
06.10. – 11.10.2013 **Sofic Entropy**
Organizers: Lewis Bowen, Austin
David Kerr, College Station

Abstract
The notion of soficity for a group is a weak type of finite approximation property that simultaneously generalizes both amenability and residual finiteness. In 2008 L. Bowen discovered how it can be used to significantly broaden the scope of the classical theory of dynamical entropy beyond the setting of amenable acting groups. This Arbeitsgemeinschaft aimed to provide a comprehensive picture of the subject of sofic entropy as it has developed over the last five years.

Participants
Abert, Miklos (Budapest), Alekseev, Vadim (Göttingen), Alpeev, Andrey (St. Petersburg), Ando, Hiroshi (Wien), Backhausz, Agnes (Budapest), Bowen, Lewis (Austin), Brehm, Albrecht (Tübingen), Carderi, Alessandro (Lyon), Chung, Nhan-Phu (Leipzig), Deitmar, Anton (Tübingen), Deninger, Christopher (Münster), Dowerk, Philip (Leipzig), Epperlein, Jeremias (Dresden), Finn-Sell, Martin (Göttingen), Fulea, Dan (Mannheim), Gamm, Christoph (Leipzig), Gunesch, Roland (Darmstadt), Hayes, Benjamin (Los Angeles), Huang, Huichi (Münster), Jiang, Yongle (Buffalo), Juschenko, Kate (Evanston), Kerr, David (College Station), Khukhro, Ana (Aubiere), Kunde, Philipp (Hamburg), Kwietniak, Dominik (Krakow), Lacka, Martha (Krakow), Le Maitre, Francois (Lyon), Liang, Bingbing (Buffalo), Lledo, Fernando (Leganes), Lupini, Martino (Toronto), Mishchenko, Pavlo (Donetsk), Monheim, Frank (Tübingen), Orovitz, Joav (Beer Sheva), Podoski, Karoly (Budapest), Pogorzelski, Felix (Jena), Ren, Qinggang (Chongqing), Schlage-Puchta, Jan-Christoph (Rostock), Seward, Brandon (Ann Arbor), Sunic, Zoran (College Station), Szabo, Gabor (Münster), Szegedy, Balazs (Budapest), Szoke, Nora Gabriella (Budapest), Thom, Andreas B. (Leipzig), Tóth, László Márton (Budapest), Tucker-Drob, Robin (Pasadena), Wu, Jianchao (Münster)

2.6. Oberwolfach Seminare

Oberwolfach Seminar 1321a



19.05. – 25.05.2013 **Random Networks**

Organizers: Shankar Bhamidi, Chapel Hill
Remco van der Hofstad, Eindhoven
Frank den Hollander, Leiden
Asaf Nachmias, Vancouver

Abstract

The seminar provided an introduction to recent developments in the area of random networks and comprised four major topics: Dynamic random graphs, percolation in high dimensions, routing of random networks, and random walks in dynamic random environments.

Participants

Baroni, Enrico (Eindhoven), Bauernschubert, Elisabeth (Tübingen), Bethuelsen, Stein Andreas (Amsterdam), Bhamidi, Shankar (Chapel Hill), Chatterjee, Shirshendu (New York), den Hollander, Frank (Leiden), Erhard, Dirk (Leiden), Eslava, Laura (Montreal), Fraiman, Nicolas (Montreal), Goodman, Jesse (Leiden), Heckel, Annika (Oxford), Hulshof, Tim (Eindhoven), Komjathy, Julia (Eindhoven), Lei, Tao (Montreal), Nachmias, Asaf (Cambridge), Noel, Jonathan (Montreal), Priori-ello, Maria Luisa (Modena), Ray, Gourab (Vancouver), Ruess, Johannes (Tübingen), Schulte, Matthias (Karlsruhe), Schweer, Sebastian (Heidelberg), Vallier, Thomas (Helsinki), van der Hofstad, Remco (Eindhoven), Wen, Yuting (Montreal), Ye, Zichun (Vancouver)

Oberwolfach Seminar 1321b

19.05. – 25.05.2013 **Positional Games**

Organizers: Dan Hefetz, Birmingham
Michael Krivelevich, Tel Aviv
Milos Stojakovic, Novi Sad
Tibor Szabo, Berlin

Abstract

Positional games is a branch of Combinatorics, studying deterministic two player zero sum games with perfect information, played usually on discrete or even finite boards. The variety of games studied ranges from such recreationally popular games as Tic-Tac-Toe and Hex to abstract games played on graphs and hypergraphs. The subject of positional games is strongly related to several other branches of Combinatorics such as Ramsey Theory, Extremal Graph and Set Theory, the Probabilistic Method. The aims of this seminar were to introduce the subject and its basic notions, to acquaint the audience with the problematics and the variety of tools applied, and to discuss some recent research results and open problems in the field.

Participants

Clemens, Dennis (Berlin), Erde, Joshua (Cambridge), Ferber, Asaf (Tel Aviv), Hefetz, Dan (Birmingham), Heise, Carl Georg (Garching), Hillebrand, Anne (Oxford), Jankó, Zsuzsanna (Budapest), Krivelevich, Michael (Tel Aviv), Kronenberg, Gal (Tel Aviv), Li, Anshui (Utrecht), London, András (Szeged), Long, Eoin (London), McDowell, Andrew (Surrey), Mikalacki, Mirjana (Novi Sad), Naor, Alon (Tel Aviv), Perarnau, Guillem (Barcelona), Puleo, Gregory (Urbana), Rollin, Jonathan (Karlsruhe), Savic, Marko (Novi Sad), Stojakovic, Milos (Novi Sad), Szabo, Tibor (Berlin), Tran, Manh Tuan (Berlin), Valla, Tomas (Praha), Weller, Kerstin (Oxford), Yepremyan, Liana (Montreal)

Oberwolfach Seminar 1342a

13.10. – 19.10.2013 **Cluster Algebras and Representation Theory**

Organizers: Christof Geiss, Mexico City
David Hernandez, Paris
Bernhard Keller, Paris
Bernard Leclerc, Caen

Abstract

In this Oberwolfach Seminar the participants were introduced into cluster algebras, quantum cluster algebras and their links to representations of quivers and finite-dimensional algebras and representations of quantum affine algebras. The overall aim is to show how these links allow one to approach some of Fomin-Zelevinsky's conjectures on cluster algebras, canonical bases and total positivity.

Participants

Booker-Price, Thomas (Lancaster), Bousseau, Pierrick (Eaubonne), Casteels, Karel L. (Canterbury), Gavran, Volodymyr (Kiev), Geiss, Christof (Mexico), Geuenich, Jan (Bonn), Gleitz, Anne-Sophie (Caen), Hernandez, David (Paris), Jasso, Gustavo (Nagoya), Kalck, Martin (Bielefeld), Kim, Myungho (Seoul), Külshammer, Julian (Stuttgart), Lampe, Philipp (Bielefeld), Leclerc, Bernard (Caen), Lee, Chul-Hee (Bonn), Magee, Timothy (Austin), Nadimpalli, Santosh VRN (Orsay), Ponchon, Romain (Strasbourg), Qiu, Yu (Trondheim), Ricke, Charlotte (Bonn), Vazquez, Ramiro (Mexico), Vendramin, Leandro (Buenos Aires), White, Noah A. (Edinburgh), Williams, Harold (Berkeley), Yu, Tony Yue (Paris), Zhang, Huafeng (Paris)

Oberwolfach Seminar 1342b

13.10. – 19.10.2013 **Motivic Integration**

Organizers: Antoine Chambert-Loir, Orsay
Raf Cluckers, Lille
François Loeser, Paris
Johannes Nicaise, Leuven

Abstract

Over the last fifteen years, Motivic Integration has been the object of quite intense developments. In particular, as several different theories are now available, it is becoming more diffcult for newcomers to enter the subject and in particular to figure out the differences and common features between the various approaches. The main purpose of this Seminar was to provide an introduction to the state of the art by presenting in detail the various theories and by illustrating them with some of their more spectacular applications, which range over a wide array of fields, from Singularity Theory to Automorphic Forms.

Participants

Bilu, Margaret (Paris), Campesato, Jean-Baptiste (Nice), Cauwbergs, Thomas (Heverlee), Cely Garcia, Jorge Enrique (Pittsburgh), Chambert-Loir, Antoine (Orsay), Cluckers, Raf (Villeneuve d'Ascq), Cohier-Chevaux, Cyrus (Paris), Dupuy, Taylor (Albuquerque), Fantini, Lorenzo (Leuven), Forey, Arthur (Paris), Fresán, Javier (Bonn), Gonzalez Villa, Manuel (Heidelberg), Hartmann, Annabelle (Leuven), Kuijpers, Tristan (Leuven), Loeser, Francois (Paris), Martin, Florent (Villeneuve d'Ascq), Mohajer, Abolfazl (Mainz), Nicaise, Johannes (Heverlee), Rideau, Silvain (Orsay), Rossmann, Tobias (Bielefeld), Sebag, Julien (Rennes), Thillaisundaram, Anitha (Magdeburg), Yin, Yimu (Paris)

Oberwolfach Seminar 1348a

24.11. – 30.11.2013 **Mathematics for Scientific Programming**

Organizers: Paul Flondor, Bucharest
Jeremy Gibbons, Oxford
Cezar Ionescu, Potsdam

Abstract

The seminar focused on category theory techniques for program construction applied to implementing validated numerical methods via interval analysis. The participants learned basic category theory concepts used in program calculation, data structures and algorithms useful for symbolic computation and scientific programming, and interval analysis and applications to optimization. Among the topics that were discussed were equational reasoning in program development, techniques for improving efficiency, such as: fusion or deforestation, generic algorithms for the optimal bracketing problem, the interval-based Newton method for computing zeroes of elementary functions, interval-based global optimization.

Participants

Abler, Daniel (Geneve), Andreetta, Christian (Copenhagen), Balan, Adriana (Bucharest), Bauer, Sabine (Neuried), Bulbul, Rizwan (Islamabad), Flondor, Paul (Bucharest), Gawlok, Simon (Heidelberg), Gibbons, Jeremy (Oxford), Hajdu, Akos (Budapest), Hirai, Yoichi (Tsukuba), Ionescu, Cezar (Potsdam), Koot, Ruud (Utrecht), List, Ivo (Ljubljana), Natarajan, Raja (Mumbai), Pacaci, Görkem (Uppsala), Pimentel, Marco (Oxford), Robillard, Simon (Orleans), Ruderer, Martin (Regensburg), Sáenz-Carrasco, Juan Carlos (Nottingham), Shetty D., Pushparaj (Mangalore), Smith, William Peter Joseph (Oxford), Vidican, Roxana (Bucuresti)

Oberwolfach Seminar 1348b

24.11. – 30.11.2013 **The Mathematics of Quantum Chemistry**

Organizers: Eric Cances, Paris
Gero Friesecke, München
Reinhold Schneider, Berlin
Harry Yserentant, Berlin

Abstract

Quantum mechanics is the key to any deeper understanding of the behavior of atomic and molecular systems. Quantum mechanical calculations are central to modeling molecular processes with applications in chemistry, biochemistry, solid state physics, and nano-sciences. In mathematical terms, the basic problem is to find the solutions of the Schrödinger equation for a system of electrons and atomic nuclei that interact by electrostatic attraction and repulsion forces. Due to the high-dimensionality of the problem, approximating the solutions is inordinately challenging and not possible with the standard methods of numerical mathematics. Despite tremendous progress within the last decades and a deep impact in sciences and technology, the field of quantum mechanical calculations has been rather ignored in numerical analysis and applied mathematics. This unsatisfying situation is presently changing. The purpose of this seminar was to give an introduction to this field and its mathematical background and the challenges that it constitutes for analysis and numerical mathematics.

Participants

Bachmayr, Markus (Aachen), Cances, Eric (Marne-la-Vallee), Ciaramella, Gabriele (Würzburg), Fath, Lukas (Karlsruhe), Fischer, Julian (Zürich), Friesecke, Gero (Garching bei München), Gontier, David (Marne-la-Vallee), Henneke, Felix (Garching bei München), Huber, Benjamin (Berlin), Klaiber, Andreas (Garching bei München), Litcarev, Mikhail (Moscow), Mendl, Christian (Garching), Pfeffer, Max (Berlin), Piovano, Paolo (Wien), Rakhuba, Maxim (Moscow), Schneider, Reinhold (Berlin), Scholz, Stephan (Berlin), Sprengel, Martin (Würzburg), Steinlechner, Michael Maximilian (Lausanne), Wolf, Sebastian (Berlin), Yserentant, Harry (Berlin)

2.7. Fortbildungsveranstaltungen/Training weeks

Trainings- und Abschlussseminar für die Internationale Mathematik-Olympiade 1323

02.06. - 08.06.2013 **Trainings- und Abschlussseminar für die Internationale Mathematik-Olympiade**

Organizer: Hans-Dietrich Gronau, Rostock

Abstract

The Institute hosted again the annual final training week for especially gifted German pupils to prepare for the International Mathematical Olympiad.

Participants

Abdel-Rahman, Mona (Planegg), Bernert, Christian (Bückeburg), Fritsch, Robin (Lehrte), Grande, Vincent (Leipzig), Hertrich, Christoph (Geisenheim), Lee, Yunseok (Bonn), Mann, Lucas (Berlin), Meister, Marvin (Bremen), Munser, Lars (Magdeburg), Paulsen, Matthias (Miesbach), Pfeiffer, Paul (Mönchengladbach), Riekert, Adrian (Pinneberg), Rothgang, Michael (Bremen), Schmidt, David (Xanten), Schwarz, Elisabeth (Bayreuth), Stöhler, Jörn (Landsberg am Lech)

Fortbildungsveranstaltung für Bibliotheksleiter 1345c

03.11. – 09.11.2013 **Fortbildungsveranstaltung für Bibliotheksleiter**
Organizer: Petra Hätscher, Konstanz

Abstract
Das Thema der Fortbildungsveranstaltung 2013 für Leitungspersonal von wissenschaftlichen Bibliotheken in Baden-Württemberg lautete „Lernort, Lehrraum, Forschungsstätte Bibliothek – real und virtuell". Als Einführung wurden Fragen behandelt wie z.B. „Benötigen wir noch Bibliotheksräume?". Danach wurden folgende Themenblöcke behandelt: 1. Lernort: real / virtuell, 2. Lehrraum: real / virtuell, 3. Forschungsstätte: real / virtuell, 4. Technische Anforderungen, 5. Bauliche Anforderungen.

Participants
Arnold, Karin (Tübingen), Becker, Ute (Stuttgart), Berggold, Christine (Stuttgart), Bickmann, Regina (Freiburg), Ebrecht, Katharina (Reutlingen), Engel, Wolfram (Ulm), Glaser, Nadja (Stuttgart), Hafner, Ralph (Konstanz), Hätscher, Petra (Konstanz), Horn, Norbert (Mannheim), Johannsen, Jochen (Karlsruhe), Kellersohn, Antje (Freiburg), Krähling, Maren (Karlsruhe), Mönnich, Michael (Karlsruhe), Mühlenberg, Heinke (Heidelberg), Rautenberg, Katharina (Mannheim), Rieger, Stefan (Tübingen), Rumpel, Jutta (Sigmaringen), Sabelus, Bettina (Stuttgart), Schelling, Bernd (Konstanz), Sczech, Sebastian (Stuttgart), Straub, Martina (Freiburg), Tangen, Diana (Karlsruhe), Uhler, Manfred (Heidelberg)

2.8. Research in Pairs

Die folgenden Forscher nahmen 2013 am Research in Pairs Programm teil:

Vasyunin, Vasily (St. Petersburg) Volberg, Alex (East Lansing)	06.01.-02.02.2013
Mayer, Volker (Villeneuve d'Ascq) Urbanski, Mariusz (Denton)	06.01.-19.01.2013
Conti, Roberto (Rom) Hong, Jeong Hee (Busan) Szymanski, Wojciech (Odense)	13.01.-26.01.2013
Gomez Perez, Domingo (Santander) Ostafe, Alina (Sydney)	27.01.-09.02.2013
Brenti, Francesco (Roma) Caselli, Fabrizio (Bologna)	03.02.-23.02.2013
Bracciali, Cleonice F. (Sao Jose do Rio Preto) Moreno-Balcazar, Juan J. (Almeria)	10.02.-02.03.2013
Suhr, Stephan (Hamburg) Zehmisch, Kai (Köln)	17.02.-02.03.2013
Levay, Peter (Budapest) Planat, Michel (Besancon) Saniga, Metod (Tatranska Lomnica)	24.02.-16.03.2013
Curbera, Guillermo P. (Sevilla) Ricker, Werner J. (Eichstätt)	24.02.-23.03.2013
Ivanov, Anatoli F. (Lehman) Michiels, Wim (Heverlee) Verriest, Erik (Atlanta)	10.03.-23.03.2013
Boyer, Steven (Montreal) Gordon, Cameron M. (Austin)	17.03.-30.03.2013
Charina, Maria (Dortmund) Conti, Costanza (Florenz) Protasov, Vladimir (Moskau)	24.03.-06.04.2013
Denisov, Denis (Manchester) Kolb, Martin (Reading) Wachtel, Vitali (München)	07.04.-20.04.2013
Fejes Toth, Gabor (Budapest) Kuperberg, Wlodzimierz (Auburn)	07.04.-04.05.2013
Eichelsbacher, Peter (Bochum) Löwe, Matthias (Münster)	07.04.-20.04.2013
Giani, Stefano (Durham) Grubisic, Luka (Zagreb) Hakula, Harri (Aalto) Ovall, Jeffrey S. (Lexington)	21.04.-04.05.2013
Barlet, Daniel (Vandoeuvre-Les-Nancy) Magnusson, Jon Ingolfur (Reykjavik)	05.05.-18.05.2013
Kosakowska, Justyna (Torun) Schmidmeier, Markus (Boca Raton)	05.05.-18.05.2013
Aue, Alexander (Davis) Hörmann, Siegfried (Bruxelles)	12.05.-08.06.2013
Kawohl, Bernd (Köln) Lucia, Marcello (Staten Island)	26.05.-15.06.2013

The following researchers attended the Research in Pairs Program in 2013:

Cuypers, Hans (Eindhoven) Fleischmann, Silvie Yael (Eindhoven) Roberts, Kieran (Eindhoven) Shpectorov, Sergey V. (Birmingham)	26.05.-08.06.2013
Parameswaran, Aryampilly J. (Mumbai) Tibar, Mihai (Villeneuve d'Ascq)	09.06.-22.06.2013
Petersen, Kathleen (Tallahassee) Sinclair, Christopher Dean (Eugene)	09.06.-22.06.2013
Ehsani, Dariush (Wuppertal) Razani, Abdolrahman (Qazvin) Sahutoglu, Sonmez (Toledo)	23.06.-12.08.2013
Conell, Christopher (Bloomington) Suarez-Serrato, Pablo (Mexico) Tapie, Samuel (Nantes)	30.06.-13.07.2013
Ferreira, Luiz Agostinho (Sao Carlos) Zakrzewski, Wojtek (Durham)	14.07.-03.08.2013
Burban, Igor (Köln) Drozd, Yuri A. (Kiev)	21.07.-03.08.2013
Nagy, Paul-Andi (Murcia) Nurowski, Pawel (Warszawa)	04.08.-31.08.2013
Korneev, Vadim Glebovitsch (St. Petersburg) Langer, Ulrich (Linz)	04.08.-24.08.2013
Dumnicki, Marcin (Krakow) Harboourne, Brian (Lincoln) Roe, Joaquim (Bellaterra) Szemberg, Tomasz (Krakow)	25.08.-07.09.2013
Goffeng, Magnus (Hannover) Mesland, Bram (Coventry)	25.08.-15.09.2013
Macias-Virgos, Enrique (Santiago de Compostela) Oprea, John F. (Cleveland) Strom, Jeff (Kalamazoo) Tanre, Daniel (Lille)	08.09.-21.09.2013
Chung, Nhan-Phu (Leipzig) Zhang, Guo Hua (Shanghai)	29.09.-12.10.2013
Hytönen, Tuomas (Helsinki) Van Neerven, Jan (Delft) Veraar, Mark (Delft) Weis, Lutz (Karlsruhe)	27.10.-09.11.2013
Chiantini, Luca (Siena) Ikenmeyer, Christian (Paderborn) Landsberg, Joseph M. (College Station) Ottaviani, Giorgio (Firenze)	03.11.-16.11.2013
Josuat-Verges, Matthieu (Marne-la-Vallee) Kim, Jang-Soo (Minneapolis)	03.11.-16.11.2013
Chechkin, Gregory A. (Moscow) Mel'nyk, Taras A. (Kiev)	10.11.-30.11.2013

Fejes Toth, Gabor (Budapest) Kuperberg, Wlodzmimierz (Auburn)	17.11.-30.11.2013
Hartenstine, David (Bellingham) Rudd, Matthew B. (Sewanee)	17.11.-30.11.2013
Borodachov, Sergiy (Towson) Hardin, Douglas (Nashville) Saff, Edward B. (Nashville)	08.12.-21.12.2013

V. Vasyunin, A. Volberg

V. Mayer, M. Urbanski

R. Conti, J.H. Hong, W. Szymanski

D. Gomez Perez, A. Ostafe

F. Brenti, F. Caselli

J. J. Moreno-Balcazar, C.F. Bracciali

S. Suhr, K. Zehmisch

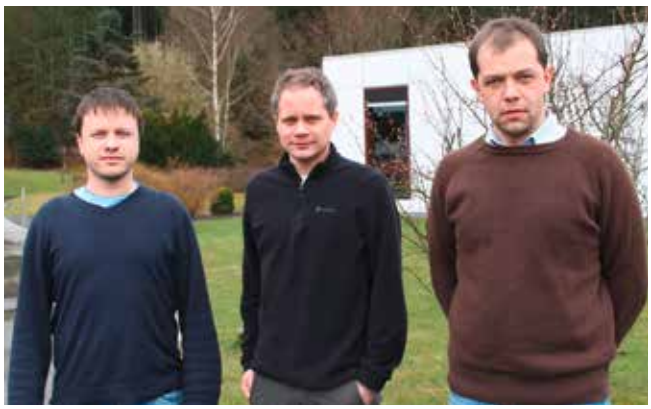
M. Planat, P. Levay, M. Saniga

G. Curbera, W. Ricker

A. F. Ivanov, E. Verriest

W. Michiels, E. Verriest

C. Gordon, S. Boyer



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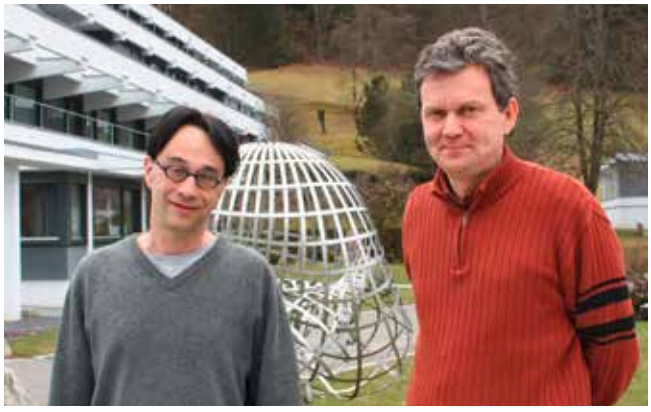
W. Kuperberg, G. Fejes Toth



M. Löwe, P. Eichelsbacher

J. Ovall, L. Grubisic, H. Hakula, S. Giani

J. I. Magnusson, D. Barlet

M. Schmidmeier, J. Kosakowska

A. Hörmann, S. Aue

B. Kawohl, M. Lucia

S. Shpectorov, S. Fleischmann, K. Roberts, H. Cuypers

M. Tibai, A. J. Parameswaran

K. Petersen, C. Sinclair

S. Sahutoglu, A. Razani, D. Ehsani

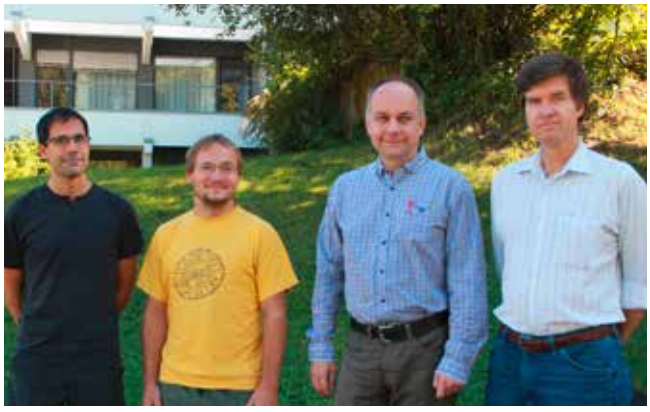
P. Suárez-Serrato, C. Conell, S. Tapie

L. Feirrera, W. Zakrzewski

I. Burban, Y. Drozd

P. Narowski, P. Nagy

V. Korneev, U. Langer



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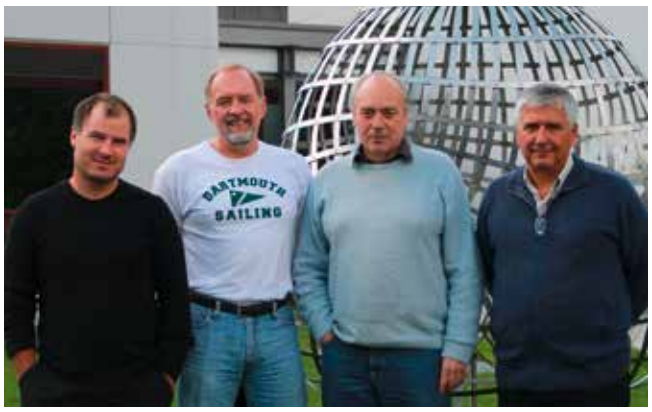

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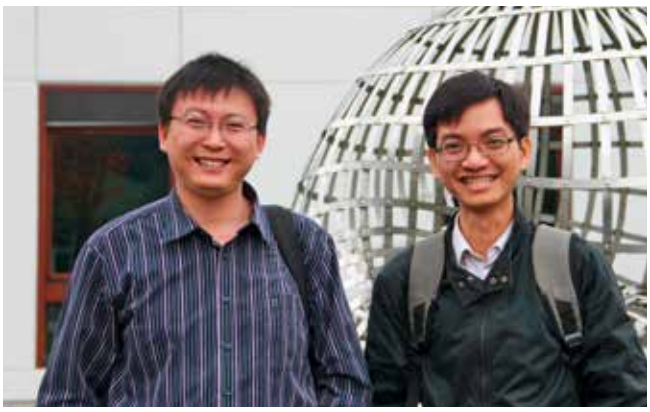
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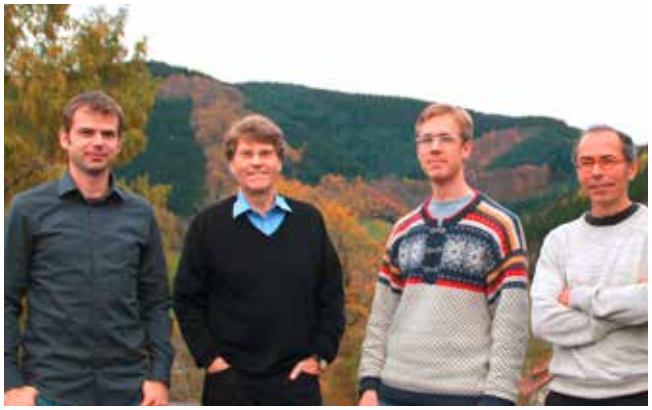
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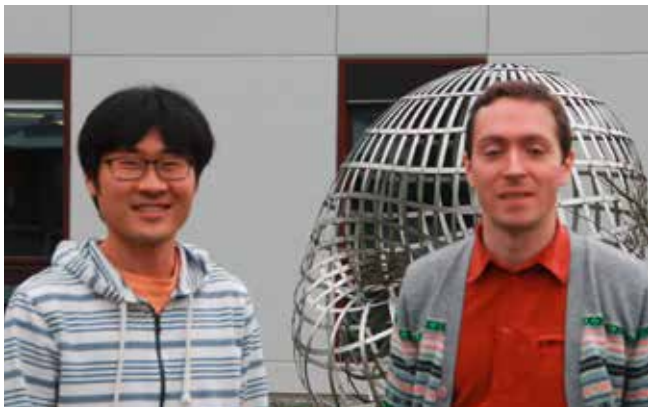
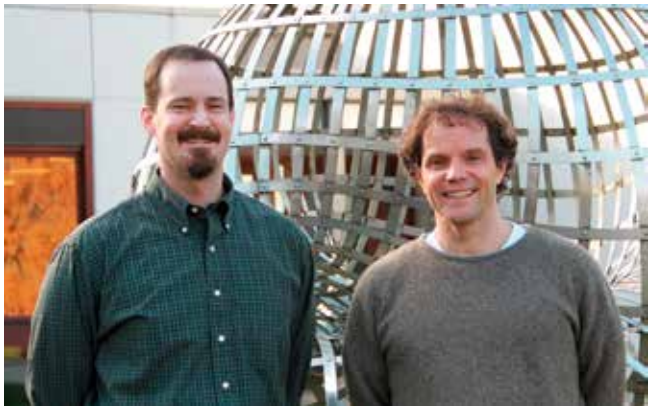
G. Ottaviani, J. Landsberg, C. Ikenmeyer, L. Chiantini


J. Kim, M. Josuat-Vergès


T. Mel'nyk, G. Chechkin


M. Rudd, D. Hartenstine


D. Hardin, S. Borodachow, E. Saff

2.9. Special research stays

Constant, Jean (South Court)	20.01.-22.01.2013
Guglielmi, Nicola (Aquila)	02.04.-05.04.2013
Bolthausen, Erwin (Zürich)	24.04.-25.04.2013


E. Bolthausen


N. Guglielmi

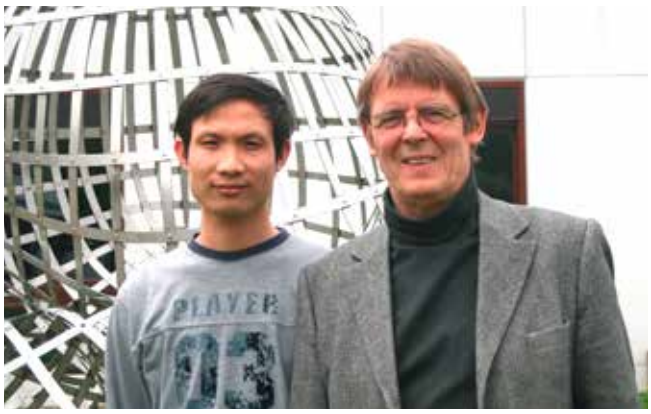
2.10. Oberwolfach Leibniz Fellows

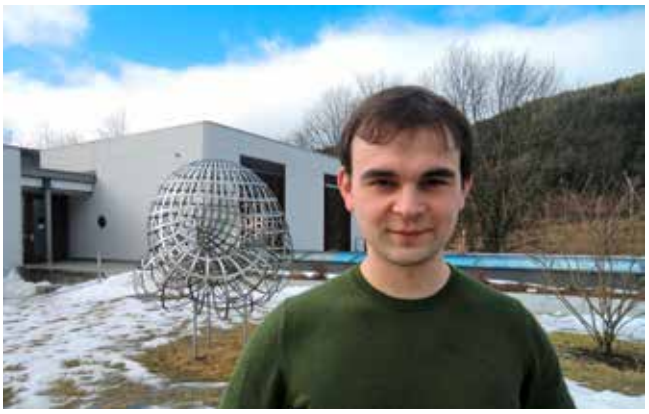
Im Jahr 2007 wurde am Mathematischen Forschungsinstitut Oberwolfach (MFO) ein neues Postdoktorandenprogramm eingeführt, mit dem Ziel, herausragende junge Mathematiker bei der Realisierung eines eigenen Forschungsprojekts während einer wichtigen Phase ihrer wissenschaftlichen Laufbahn zu unterstützen. Das MFO bietet hierfür ungestörte Arbeitsbedingungen mit einer exzellenten Infrastruktur in einem internationalen Umfeld.

Beginning in 2007 the Mathematisches Forschungsinstitut Oberwolfach (MFO) has set up a new programme for postdoctoral researchers. The focus of this programme is to support outstanding young mathematical researchers in the realization of their own research projects during an important period of their scientific career. The MFO offers undisturbed working conditions with an excellent infrastructure embedded in an international environment.

Bondarenko, Andriy V. (Kyiv)	01.01.-16.03.2013
external guest researchers:	
Radchenko, Danylo (Bonn)	27.01.-02.02.2013
Viazovska, Maryna (Bonn)	01.03.-05.03.2013
Kiraly, Franz (Berlin)	18.02.-20.04.2013
external guest researchers:	
Bruns, Winfried (Osnabrück)	17.02.-01.03.2013
Kreuzer, Martin (Passau)	24.02.-02.03.2013
Theran, Louis (Berlin)	03.03.-23.03.2013
	01.04.-06.04.2013
Tomioka, Ryota (Tokyo)	05.03.-15.03.2013
Rosen, Zvi (Berkeley)	11.03.-21.03.2013
Ehler, Martin (Neuherberg)	24.03.-30.03.2013
Ziehe, Andreas (Berlin)	07.04.-13.04.2013
Blythe, Duncan (Berlin)	14.04.-19.04.2013
Watanabe, Sumio (Yokohama)	14.04.-20.04.2013
Nguyen, Hong Duc (Kaiserslautern)	31.03.-29.06.2013
external guest researcher:	
Greuel, Gert-Martin (Kaiserslautern)	29.04.-03.05.2013
Brandenbursky, Michael (Nashville)	21.04.-18.05.2013
Lauret, Emilio (Cordoba)	05.05.-03.08.2013
external guest researcher:	
Boldt, Sebastian (Berlin)	07.07.-12.07.2013
Pelayo, Alvaro (St. Louis)	26.05.-30.06.2013
external guest researcher:	
Vu Ngoc, San (Rennes)	27.05.-01.06.2013
Schillewaert, Jeroen Jan (London)	28.05.-29.06.2013
external guest researcher:	
Van Maldeghem, Hendrik (Gent)	28.05.-02.06.2013
	18.06.-23.06.2013
Michalek, Mateusz	
(Saint-Martin-d'Heres)	01.07.-30.08.2013
external guest researchers:	
Palka, Karol (Montreal)	23.07.-30.07.2013
Kahle, Thomas (Garching)	22.08.-30.08.2013
Kühn, Christian (Wien)	28.07.-31.08.2013
	29.09.-30.10.2013

Avdeev, Roman (Moscow)	13.10.-14.12.2013
external guest researcher:	
Cupit-Foutou, Stephanie (Bochum)	20.10.-25.10.2013
	08.12.-13.12.2013
Izhakian, Zur (Ramat-Gan)	02.11.-17.12.2013
external guest researchers:	
Bey, Christian (Bremen)	02.11.-09.11.2013
Knebusch, Manfred (Regensburg)	10.11.-16.11.2013
Merlet, Glenn (Marseille)	01.12.-08.12.2013
Kiraly, Franz (London)	09.12.-31.12.2013
external guest researchers:	
Chaulet, Nicolas (London)	15.12.-20.12.2013
Oksanen, Lauri (London)	15.12.-21.12.2013


H. Nguyen, G. Greuel


A. Bondarenko

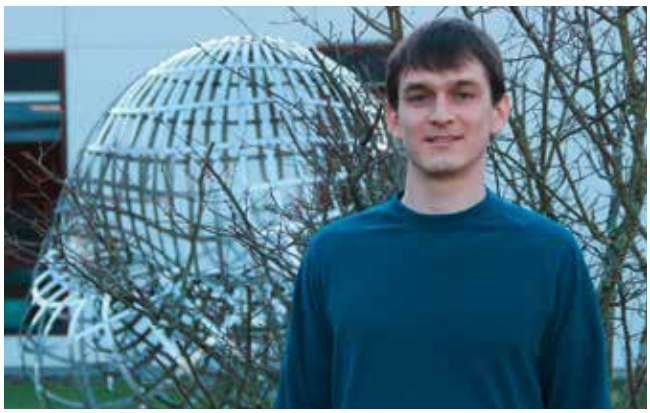

E. Lauret


M. Brandenbursky


J. Schillewaert


A. Pelayo


M. Michalek



R. Avdeev

C. Kühn

L. Oksanen, F. Király, N. Chaulet

Z. Izhakian, M. Knebusch

2.11. Publikationen 2013

Das MFO unterstützt die Idee von Open Access. Daher sind alle Publikationen auf der Webseite www.mfo.de des MFO elektronisch frei verfügbar (mit Ausnahme der Buchreihe Oberwolfach Seminars beim Birkhäuser Verlag).

Oberwolfach Reports (OWR)

OWR wird in Zusammenarbeit mit dem Publishing House der EMS veröffentlicht und enthält die Ergebnisse der Workshops, Miniworkshops und Arbeitsgemeinschaften in Form von extended abstracts der Vorträge. Für 2013 sind die Bände OWR 10.1 bis 10.4 mit mehr als 3400 Seiten erschienen.

Oberwolfach Seminars (OWS)

OWS ist eine Buchreihe in Zusammenarbeit mit dem Birkhäuser Verlag (Basel), die den Stoff der Oberwolfach Seminare für Doktoranden, Postdocs und interessierte Forscher zugänglich macht. 2013 befanden sich zwei Bände in Vorbereitung.

2.11. Publications 2013

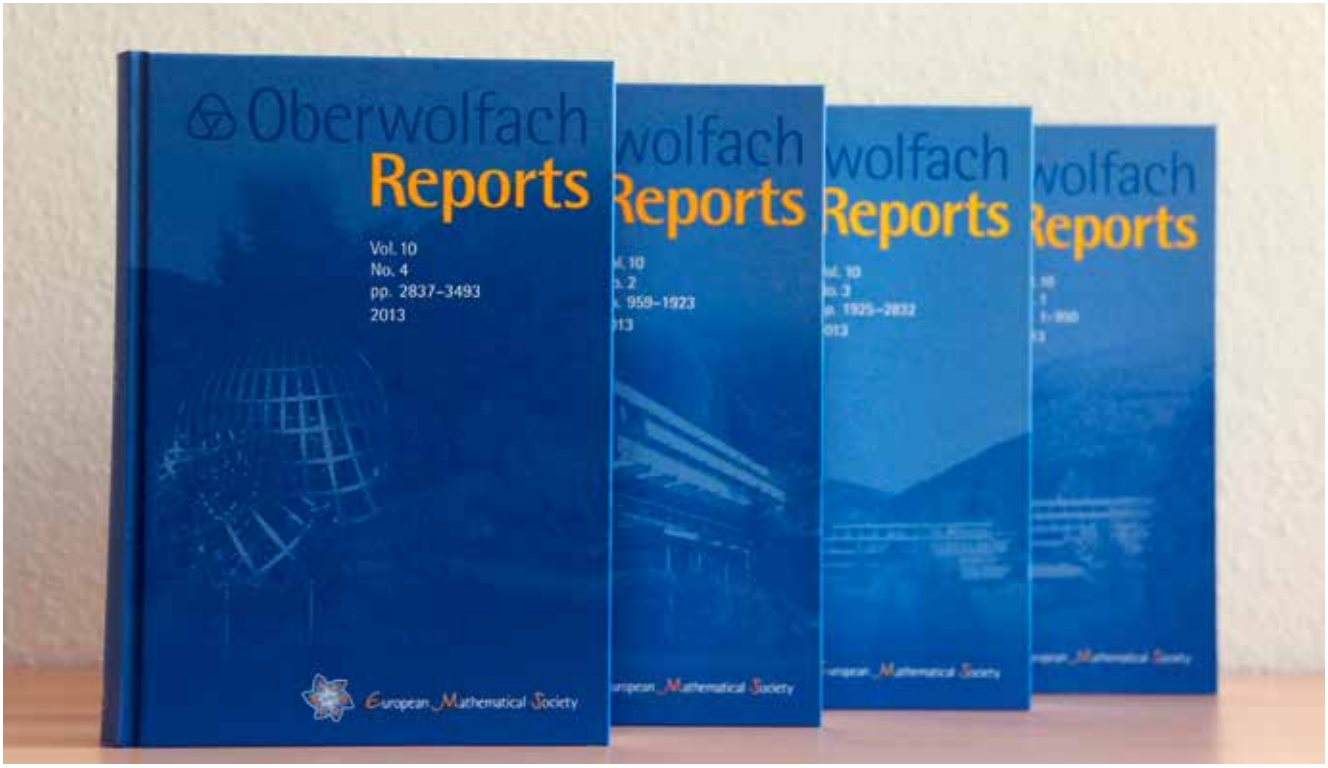
The MFO supports the idea of Open Access. Hence, all publications are freely available on the website www.mfo.de of the MFO (with the exception of the book series Oberwolfach Seminars from Birkhäuser).

Oberwolfach Reports (OWR)

OWR is published in cooperation with the EMS publishing house and contains extended abstracts of the talks in the workshops mini-workshops and Arbeitsgemeinschaften. In 2013, the issues OWR 10.1 to 10.4 were published with more than 3,400 pages in total.

Oberwolfach Seminars (OWS)

In order to make the Oberwolfach Seminars available to an even larger audience, the MFO supports the publication within the book series OWS, published in cooperation with Birkhäuser (Basel). 2013 two volumes were being prepared.



Oberwolfach Preprints (OWP)

In OWP werden Resultate von längerfristigen Forschungsaufenthalten (RiP und OWLF) publiziert, aber auch von mathematischen Vorträgen am MFO im Rahmen von besonderen Veranstaltungen, z.B. der Oberwolfach Vorlesung. In 2013 sind die folgenden Preprints erschienen:

Oberwolfach Preprints (OWP)

OWP mainly contains research results related to a longer stay in Oberwolfach (RiP and OWLF), but this can also include an Oberwolfach Lecture, for example. The following preprints were published in 2013:

- OWP 2013 - 28
  Title: Right Simple Singularities in Positive Characteristic
  Authors: Gert-Martin Greuel and Nguyen Hong Duc (OWLF 2013)
- OWP 2013 - 27
  Title: Supertropical Quadratic Forms I
  Authors: Zur Izhakian, Manfred Knebusch, and Louis Rowen (OWLF 2013)
- OWP 2013 - 26
  Title: Enhanced Spatial Skin-Effect for Free Vibrations of a Thick Cascade Junction with "Super Heavy" Concentrated Masses
  Authors: Gregory A. Chechkin, Taras A. Mel'nyk (RiP 2013)
- OWP 2013 - 25
  Title: A Relation Between N-Qubit and 2N-1-Qubit Pauli Groups via Binary LGr(N,2N)
  Authors: Frédéric Holweck, Metod Saniga and Péter Lévay (RiP 2013)
- OWP 2013 - 24
  Title: On the Derived Category of Grassmannians in Arbitrary Characteristic
  Authors: Ragnar-Olaf Buchweitz, Graham J. Leuschke and Michel Van den Bergh (RiP 2012)
- OWP 2013 - 23
  Title: Mehler-Heine Asymptotics of a Class of Generalized Hypergeometric Polynomials
  Authors: Cleonice F. Bracciali and Juan José Moreno-Balcázar (RiP 2013)

- OWP 2013 - 22
  Title: Very General Monomial Valuations of P2 and a Nagata Type Conjecture
  Authors: Marcin Dumnicki, Brian Harbourne, Alex Küronya, Joaquim Roé, and Tomasz Szemberg (RiP 2013)
- OWP 2013 - 21
  Title: On Conjugary of MASAs and the Outer Automorphism Group of the Cuntz Algebra
  Authors: Roberto Conti, Jeong Hee Hong, and Wojciech Szymanski (RiP 2013)
- OWP 2013 - 20
  Title: Non-Stationary Multivariate Subdivision: Joint Spectral Radius and Asymptotic Similarity
  Authors: Maria Charina, Costanza Conti, Nicola Guglielmi, and Vladimir Protasov (RiP 2013)
- OWP 2013 - 19
  Title: Local Asymptotics for the Area of Random Walk Excursions
  Authors: Denis Denisov, Martin Kolb, and Vitali Wachtel (RiP 2013)
- OWP 2013 - 18
  Title: On the Autonomous Metric on Groups of Hamiltonian Diffeomorphisms of Closed Hyperbolic Surfaces
  Authors: Michael Brandenbursky (OWLF 2013)
- OWP 2013 - 17
  Title: Grassmannian Connection Between Three- and Four-Qubit Observables, Mermin's Contextuality and Black Holes
  Authors: Péter Lévay, Michel Planat and Metod Saniga (RiP 2013)
- OWP 2013 - 16
  Title: Near Critical Density Irregular Sampling in Bernstein Spaces
  Authors: Alexander Olevskii and Alexander Ulanovskii (RiP 2012)
- OWP 2013 - 15
  Title: Linking and Closed Orbits
  Authors: Stefan Suhr and Kai Zehmisch (RiP 2013)
- OWP 2013 - 14
  Title: On Concentrators and Related Approximation Constants
  Authors: A. V. Bondarenko, A. Prymak, and D. Radchenko (OWLF 2013)
- OWP 2013 - 13
  Title: Mesh Ratios for Best-Packing and Limits of Minimal Energy Configurations
  Authors: A. V. Bondarenko, D. P. Hardin, and E. B. Saff (OWLF 2013)
- OWP 2013 - 12
  Title: Obtaining Error-Minimizing Estimates and Universal Entry-Wise Error Bounds for Low-Rank Matrix Completion
  Authors: Franz J. Király and Louis Theran (OWLF 2013)
- OWP 2013 - 11
  Title: Solid Extensions of the Cesàro Operator on the Hardy Space H2(D)
  Authors: Guillermo P. Curbera and Werner J. Ricker (RiP 2013)
- OWP 2013 - 10
  Title: Calculating Conjugacy Classes in Sylow p-Subgroups of Finite Chevalley Groups of Rank Six and Seven
  Authors: Simon M. Goodwin, Peter Mosch, and Gerhard Röhrle (RiP 2012)
- OWP 2013 - 09
  Title: G-Complete Reducibility in Non-Connected Groups
  Authors: Michael Bate, Sebastian Herpel, Benjamin Martin, and Gerhard Röhrle (RiP 2012)
- OWP 2013 - 08
  Title: Noncompact Harmonic Manifolds
  Authors: Gerhard Knieper and Norbert Peyerimhoff (RiP 2012)

- OWP 2013 - 07
  Title: Sharp Constants in the Classical Weak Form of the John-Nirenberg Inequality
  Authors: Vasily Vasyunin and Alexander Volberg (RiP 2013)
- OWP 2013 - 06
  Title: Legendrian Rational Unknots in Lens Spaces
  Authors: Hansjörg Geiges and Sinem Onaran (RiP 2012)
- OWP 2013 - 05
  Title: The Algebraic Combinatorial Approach for Low-Rank Matrix Completion
  Authors: Franz J. Király, Louis Theran, Ryota Tomoika, and Takeaki Uni (OWLF 2012/2013)
- OWP 2013 - 04
  Title: Multiple Bernoulli Series and Volumes of Moduli Spaces of Flat Bundles over Surfaces
  Authors: Velleda Baldoni, Arzu Boysal and Michèle Vergne (RiP 2012)
- OWP 2013 - 03
  Title: On the Geometry of Regular Maps From a Quasi-Projective Surface to a Curve
  Authors: A. J. Parameswaran and M. Tibar (RiP 2012)
- OWP 2013 - 02
  Title: Even-Homogeneous Supermanifolds on the Complex Projective Line
  Authors: E. G. Vishnyakova (OWLF 2012)
- OWP 2013 - 01
  Title: Low Rank Differential Equations for Hamiltonian Matrix Nearness Problems
  Authors: Nicola Guglielmi, Daniel Kressner, and Christian Lubich (RiP 2012)

3. Sachlicher und Finanzieller Teil

3.1. Übersicht der Bereiche

Die wissenschaftliche Arbeit der Gastforscher am Institut wird durch eine effiziente Infrastruktur ermöglicht.

Von besonderer Bedeutung ist dabei die Bibliothek, die in der mathematischen Forschung eine ähnliche Rolle spielt wie das Labor in den Naturwissenschaften. Die Bibliothek des MFO zählt zu den weltweit besten Spezialbibliotheken in der Mathematik und steht den Wissenschaftlern Tag und Nacht zur Verfügung.

Daneben spielt der Bereich der Informationstechnologie eine wichtige Rolle, einerseits direkt für die wissenschaftliche Arbeit (elektronische Publikationen, Datenbanken und mathematische Software), andererseits auch für die weltweite Kommunikation der Forscher untereinander (Email, Internet und Informationsdienste).

Zur Planung, Durchführung und Begleitung der wissenschaftlichen Programme waren am Institut etwa 20 Stellen in den Bereichen der wissenschaftlichen Verwaltung, Bibliothek, IT-Abteilung, Verwaltungsleitung, Gästebetreuung und Hauswirtschaft besetzt. Für die effiziente konzentrierte Arbeit der Forscher am MFO sind dabei die abgeschiedene Lage, die hervorragende wissenschaftliche Infrastruktur, und nicht zuletzt auch die ideale Betreuung einschließlich Unterbringung und Verpflegung im Gästehaus, direkt neben dem Tagungs- und Bibliotheksgebäude, wichtige Faktoren.

Die folgenden Abschnitte geben einen eingehenden Bericht über die genannten Bereiche.

3.2 Bibliothek

Die Bibliothek ist und bleibt für die Wissenschaftler in Oberwolfach das wichtigste Arbeitsmittel. Vor allem die Forscher in den Programmen „Research in Pairs" und „Oberwolfach Leibniz Fellows" nutzen die Bibliothek äußerst intensiv, aber auch für die Teilnehmer der einzelnen Workshops ist sie unverzichtbar. Immer wieder kommen Mathematiker nach Oberwolfach, um Literatur zu bearbeiten, die für sie sonst nicht zugänglich ist. Als Präsenzbibliothek ist sie für die Teilnehmer der Forschungsprogramme rund um die Uhr geöffnet. Neben dem hohen internationalen Standard des wissenschaftlichen Programms und den exzellenten Rahmenbedingungen für den persönlichen Gedankenaustausch ist

3. General and financial statements

3.1. Overview on the divisions

The MFO has set up an excellent infrastructure for scientific research activities.

The library represents a vital part of this infrastructure and plays an important role, similar to laboratories in experimental sciences. The MFO's library is one of the world's most excellent libraries in mathematics and can be used by the guest researchers 24 hours a day.

But also information technology is of great importance for assisting research activities (electronic publications, database and mathematical software), and also to ensure worldwide communication among the scientific community (e-mail, internet, and information services).

For the planning and realization of the scientific program approximately 20 positions in various divisions, such as scientific and administration management, library, IT-service, guest service, and housekeeping are provided. Besides the excellent scientific infrastructure it is also the institute's remote location, and the excellent service with board and lodging in our guest house close to the conference and library building, that guarantees efficient and concentrated working conditions for our guests.

In the following detailed information will be given on the various divisions.

3.2 Library

The library has been and will continue to be the most important working tool for scientific research at Oberwolfach. It is used most intensively especially by the researchers visiting the MFO as part of the Research in Pairs Program and the Oberwolfach Leibniz Fellow Program, but also by the participants of the workshop program. Repeatedly, mathematicians are visiting Oberwolfach in order to use literature to which they wouldn't have access otherwise. As a reference library, it can be used by the Institute's guests 24 hours a day. Besides the high international standard of the scientific program and the excellent working conditions, the library is an important factor for the high reputation

die Bibliothek ein wichtiger Grund für das hohe Ansehen des MFO weltweit. Angesichts dramatisch steigender Preise bei den wissenschaftlichen Zeitschriften ist es schwierig, das erreichte Niveau zu halten oder gar zu steigern. Dies war nur möglich durch Spenden der Carl Friedrich von Siemens Stiftung sowie durch Sachspenden von Verlagen.

of the MFO worldwide. In times of dramatically increasing prices for scientific journals it is difficult to keep this level; this has only been possible because of support from the Carl-Friedrich von Siemens Stiftung and book donations from publishing houses.

Das MFO nimmt seit 1995 am Südwestdeutschen Bibliotheksverbund (SWB) teil. Die Arbeit im Verbund sowie die durch das Bibliotheksservice-Zentrum Baden-Württemberg (BSZ) als betreuende Institution bereitgestellte Software bedeuten für das Institut eine erhebliche Erleichterung bei der Verwaltung der Bibliotheksbestände.

Since 1995 the MFO has been a member of the Südwestdeutscher Bibliotheksverbund (SWB), which, together with the software provided by the Bibliotheksservice-Zentrum Baden-Württemberg (BSZ) as supporting institution, facilitates the cataloging of our library collection enormously.

3.2.1. Bestandsüberblick

Zum Jahresende 2013 belief sich der im elektronischen Katalog nachgewiesene Gesamtbestand an Büchern auf etwa 55.100 Bände. Hinzu kamen 28.300 Zeitschriftenbände. Darüber hinaus standen den Institutsgästen ca. 5.000 Dissertationen, 520 laufende Zeitschriften-Abonnements in gedruckter Form sowie ca. 5.300 lizenzierte elektronische Zeitschriften zur Verfügung.

3.2.1. Overview of the inventory

By the end of 2013 the stock of books included in our electronic catalog totaled approx. 55,100 volumes and approx. 28,300 volumes of bound journals. In addition to that, approx. 5,000 dissertations, 520 current subscriptions to journals as well as about 5,300 licensed electronic journals were available to the Institute's guests.

3.2.2. Bestandsentwicklung

Der Bestand an Büchern wurde im Jahr 2013 um insgesamt 1.655 Bände vermehrt. Davon hat die Bibliothek 887 Bände im Rahmen der ständigen Buchausstellung erhalten. Mit Mitteln der Siemens Stiftung wurden 132 Bücher erworben.

3.2.2. Development of the inventory

The book inventory increased in 2013 by 1,655 volumes in total; 887 of these were donations for the permanent book exhibition. 132 volumes were bought with means from the Siemens Stiftung.

Zum Jahresende 2013 hat das MFO 518 Zeitschriften laufend bezogen. Davon wurden 390 durch ein reguläres Abonnement gegen Rechnung bezogen. 75 Titel erhielten wir im Rahmen eines Tauschabkommens und weitere 53 Titel erhielten wir als Geschenk.

By the end of 2013, the Institute subscribed to 518 journals, 390 of those by regular subscription on account, 75 within an exchange agreement, and 53 were received as donations.

Um die Versorgung mit elektronischer Fachinformation an deutschen Hochschulen, Forschungseinrichtungen und wissenschaftlichen Bibliotheken nachhaltig zu verbessern, finanziert die Deutsche Forschungsgemeinschaft seit 2004 den Erwerb von National- sowie sogenannten Allianzlizenzen. Das MFO hat im Rahmen dieser Nationallizenzen zusätzlich zu den etwa 600 regulären elektronischen Zeitschriftenabonnements weitere ca. 5.300 Zeitschriften elektronisch zur Verfügung stellen können.

In order to substantially improve the acquisition of digital scientific literature by German universities, research centers and scientific libraries, the DFG started in 2004 to finance national licenses or so called "Alliance Licenses". Within this program of German national licenses the Institute has been able to provide further 5,300 electronic journals in addition to the 600 regular electronic subscriptions.

3.2.3. Buchausstellung

Die ständige Buchausstellung gibt interessierten wissenschaftlichen Verlagen die Möglichkeit, ihre Neuerscheinungen im Bereich Mathematik

3.2.3. Book exhibition

The permanent book exhibition is an offer for interested scientific publishing houses to present their latest mathematical releases at the

am MFO über einen längeren Zeitraum zu präsentieren. Einige der wichtigsten Verlagshäuser weltweit beteiligen sich teilweise mit ihrem gesamten mathematischen Programm daran. Insgesamt gingen 887 Bücher von 19 verschiedenen Verlagen im Rahmen der Buchausstellung in den Bibliotheksbestand ein.

Institute over a longer period. Some of the most important publishing houses worldwide use this platform to present their program in mathematical sciences. Consequently 887 books from 19 different publishing houses have become part of the library's collection within the year 2013.

3.2.4 E-Books des Springer Verlags

Im Dezember 2013 hat die Bibliothek das Springer Book Archive – Mathematics and Statistics gekauft. Diese Sammlung von E-Books enthält ungefähr 7.000 Titel, die zwischen 1929 und 2004 erschienen sind. Die E-Books sind zugänglich über den Bibliothekskatalog sowie das Bibliotheksportal. Die Nutzung dieser E-Books ist für alle Gäste des Instituts kostenlos während ihres Aufenthalts. Es ist möglich, ganze Bücher auf einmal herunterzuladen und für den persönlichen Gebrauch zu speichern.

3.2.4 E-books from Springer

In 2013 the MFO library bought the Springer Book Archive – Mathematics and Statistics. This collection of E-books includes about 7,000 titles published between 1929 and 2004. The E-Books are accessible through the library catalog or via the library search portal. The use of these E-Books is free of charge for all guests during their stay at Oberwolfach. It is possible to download entire books at once and the downloaded filed may be kept for personal use.

3.2.5. Fotosammlung

Das MFO verfügt über eine sehr große Sammlung an Mathematiker-Porträts, zusammengetragen durch Herrn Prof. Dr. Konrad Jacobs, Erlangen. Diese Sammlung ist im Jahr 2004 mit Hilfe des Springer Verlags Heidelberg digitalisiert worden; sie steht im Internet mit verschiedenen Recherche-Funktionen frei zur Verfügung. Die Sammlung ist auch im Jahr 2013 stark angewachsen. Neben den 784 institutseigenen Fotos kamen weitere aus verschiedenen Quellen hinzu. Besonders erwähnen möchten wir an dieser Stelle Prof. George M. Bergman, der regelmäßig seine neuesten Aufnahmen für die Oberwolfacher Sammlung zur Verfügung stellt.

Ende 2013 waren ca. 16.400 Fotos in der Datenbank enthalten.

3.2.5. Photo collection

The MFO owns a large photo-collection of mathematicians which is based on the collection of Prof. Dr. Konrad Jacobs, Erlangen. In 2004, the collection was digitalized with the help of Springer Verlag, Heidelberg, and since then has been freely available on the internet with several research functions. The collection has grown again in 2013. Apart from the 784 institute-own photos, further pictures have come from various sources. We want to give special recognition here to Prof. Greorge M. Bergman, who regularly provides his newest pictures for the Oberwolfach collection.

By the end of 2013 the database listed approx. 16,400 photographs.

3.2.6. DFG-Projekt: Einrichtung eines Bibliotheksportals am MFO

Das 2011 begonnene Projekt hatte zum Ziel, einen einzigen, schnellen und einfachen Zugang zu allen in der Bibliothek des MFO verfügbaren gedruckten und elektronischen Ressourcen zu schaffen. Zudem sollte ein Linkresolver eingeführt werden, um Direktlinks aus MathSciNet oder zbMATH auf am MFO verfügbare Zeitschriftenartikel generieren zu können. Eine Nutzerbefragung begleitete das Projekt, um auch die Forschungsgäste in den Evaluierungs- und Entscheidungsprozess einzubeziehen.

Das Projekt konnte im Herbst 2013 erfolgreich abgeschlossen werden. Es wurde mit insgesamt 240.000,00 € durch die DFG gefördert und finanziert. Für die Forschungsgäste des MFO steht nun ein umfangreiches Suchportal zur

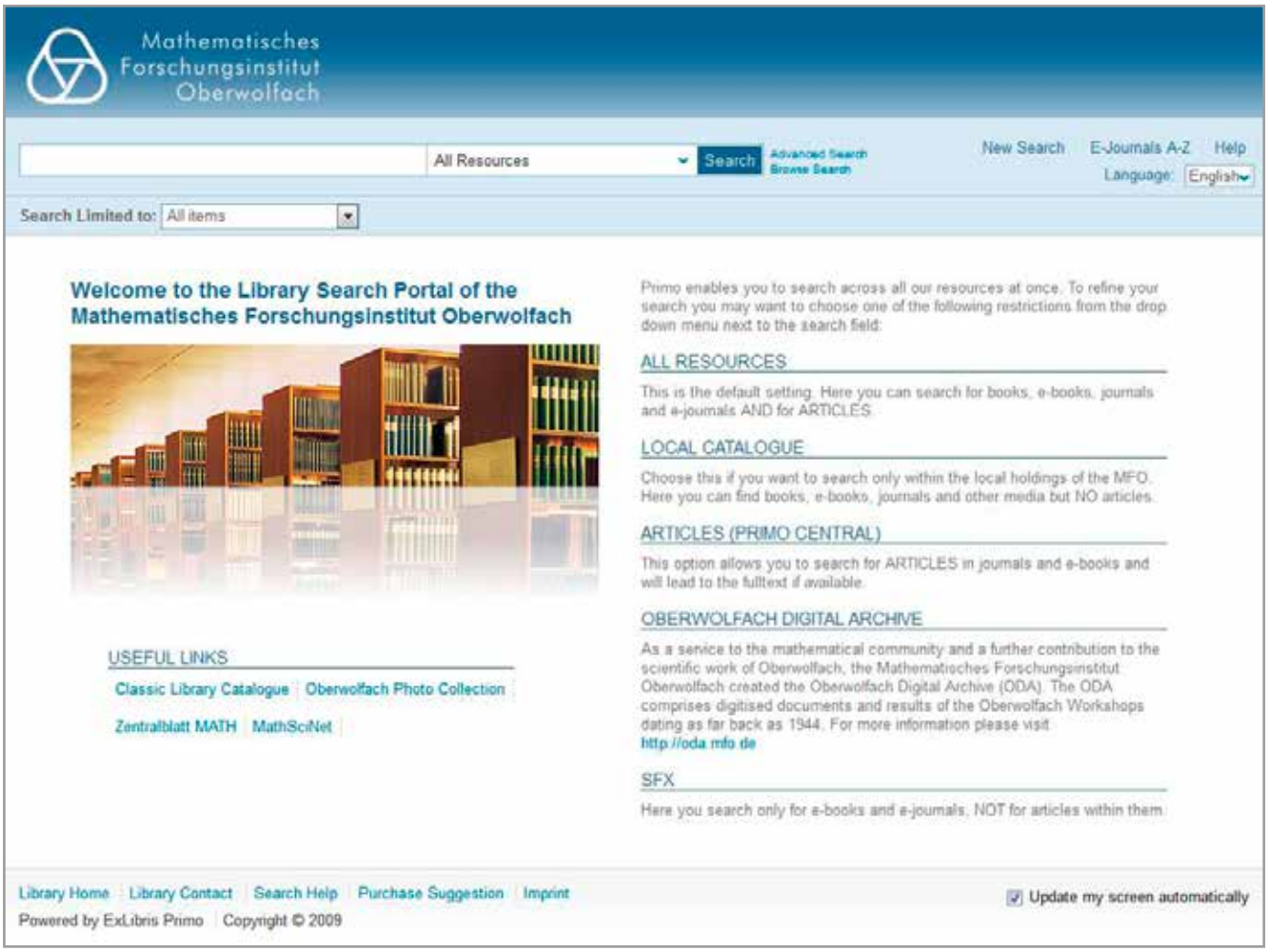
3.2.6. DFG-project "Library Search Portal"

This project has been started in 2011 with the goal to have a single, fast and easy access to all resources available at the MFO library. Furthermore, a link resolver was to be implemented to generate direct links from MathSciNet or zbMATH to journal articles available at the MFO. Accompanying the project was a user survey, giving our guest researchers the ability to be part of the evaluation and decision process.

The project was successfully completed in autumn 2013. It was supported and financed by the DFG with a total of 240,000.00 €. Guest researchers at the MFO now have an extensive search portal at their disposal, which contains all

Verfügung, das alle am MFO zugänglichen Quellen und Materialien verzeichnet und durchsuchbar macht. Grundlage des Portals ist der von der Firma ExLibris aufgebaute Suchindex Primo Central, den wir gemeinsam mit dem Produkt Primo Total Care lizenziert haben und der ständig aktualisiert und erweitert wird. Der Linkresolver SFX, ebenfalls ein Produkt der Firma ExLibris und mit dem Suchportal gekoppelt, rundet das neue Angebot ab. Das Portal ist zu erreichen über die Homepage des MFO: www.mfo.de/library .

sources and material available at the MFO, making them searchable in one convenient location. The base of the portal is the search index Primo Central, developed by the company ExLibris, which we have licensed together with the product Primo Total Care and that is constantly updated and expanded. The link resolver SFX, also a product of the company ExLibris and coupled with the search portal, completes the new offer. The portal can be reached via the homepage of the MFO: www.mfo.de/library



3.2.7 Nutzerbefragung 2013

Die im Jahr 2013 durchgeführte Nutzerbefragung fand im Rahmen des DFG-geförderten Projekts „Einrichtung eines Bibliotheksportals am Mathematischen Forschungsinstitut Oberwolfach" statt. Das ursprüngliche Ziel war es, die Wünsche der Institutsgäste beim Aufbau des oben beschriebenen Portals kennenzulernen und berücksichtigen zu können. Die Befragung enthielt jedoch auch Fragen zur künftigen Ausrichtung des Bibliotheksbestands und zur allgemeinen Einschätzung der Bibliotheksangebote und kann deshalb auch für die Zukunftsplanung herangezogen werden.

3.2.7. User survey 2013

The user survey conducted in 2013 was part of the DFG-project "Einrichtung eines Bibliotheksportals am Mathematischen Forschungsinstitut Oberwolfach" (Implementation of a library search portal at the MFO). Its original purpose was to find out and incorporate the wishes of the Institute's guests in the installation of the above mentioned portal. Yet the survey also contained questions about the future orientation of the library collections as well as about the general assessment of the library services and can in result also be consulted for planning the future.

Der Fragebogen wurde sowohl online als auch in schriftlicher Form angeboten. Die schriftlich ausgefüllten Bögen wurden zur Auswertung in das Online-System übertragen. Insgesamt wurden 124 Fragebögen zwischen dem 01.02.2013 und dem 01.09.2013 ausgefüllt.

Die Befragten sind generell sehr zufrieden mit der Bibliothek des MFO. Es wurde nur sehr wenig Kritik geübt. Die Ressourcen, die durch die Bibliothek verfügbar sind, decken sich größtenteils mit den von den Befragten gewünschten Ressourcen.

Es ist klar zu erkennen, dass bei den e-Publikationen zwischen Büchern und Zeitschriften unterschieden werden muss. Während bei den Büchern noch immer die gedruckte Version bevorzugt wird, ist bei den Zeitschriften das Gegenteil der Fall.

3.3. IT

Zweck der IT am MFO ist es, den Gastforschern und den Verwaltungsmitarbeitern effiziente Arbeitsmöglichkeiten zu bieten. Neben dem WLAN-Zugang und einem Computer Pool beinhaltet dies Literaturrecherche und Zugriff auf online verfügbare Fachzeitschriften, die Nutzung mathematischer Software auf einem Computeserver, sowie die technische Ausstattung von Vortragssälen und Bibliothek.

Die Mitarbeiter nutzen datenbankgestützte Anwendungen für die Verwaltung der Tagungen, der Bibliothek und der Finanzen. Darüber hinaus stehen die Webdienste des Instituts der Gesamtheit der Wissenschaftler zur Verfügung.

Diese umfassen
- die regulären Webseiten
- die Oberwolfach References on Mathematical Software
- die Oberwolfach Photo Collection
- den Bibliothekskatalog
- die Oberwolfach Reports
- das Oberwolfach Digital Archive
- die elektronischen Abonnements für anwesende Nutzer

Desweiteren betreut die IT des MFO das Oberwolfacher Museum für Mineralien und Mathematik MiMa. Dieses wird von der Gemeinde Oberwolfach, dem Verein der Freunde von Mineralien und Bergbau Oberwolfach und dem MFO gemeinsam betrieben; im mathematischen Teil sind interaktive Exponate der preisgekrönten Wanderausstellung IMAGINARY dauerhaft zu sehen.

The survey was offered both in print and electronic format. The filled in print questionnaires were transferred to the online system for analysis. Altogether 124 questionnaires were filled in between February 02, 2013 and September 01, 2013.

The respondents are generally very satisfied with the library of the MFO. Only little criticism was given. The resources available at the MFO coincide mostly with the resources desired by the interviewees.

It is clearly visible that in case of electronic publications a distinction has to be made between books and journals. While books are still preferred in print, the opposite is true for journals.

3.3. IT

The purpose of the IT at the MFO is to provide guest researchers and administrative staff with efficient working conditions. Besides wireless network access and computer rooms this comprises retrieval of literature and access to online scientific journals, the use of mathematical software on an application server, and finally the technical equipment of lecture rooms and the library.

Staff members use databased applications for the administration of conferences, the library and for the financial accounting. In addition, the web services of the Institute are at the disposal of the whole scientific community.

They comprise
- the regular web pages
- the Oberwolfach References on Mathematical Software
- the Oberwolfach Photo Collection
- the library catalogue
- the Oberwolfach Reports
- the Oberwolfach Digital Archive
- the subscribed electronic journals for local users

Moreover the MFO IT group services the Museum for Minerals and Mathematics MiMa. It is run jointly by the local authority, the association of friends of minerals and mining and the MFO – all seated at Oberwolfach. The maths section of the MiMa hosts interactive exhibits of the award-winning exhibition IMAGINARY.

3.3.1. Bestand Ende 2013

Hardware

- Redundante Internetanbindung über das Deutsche Forschungsnetz (DFN-Verein) mit zwei 100 Mbit/s Standleitungen
- LAN mit Gigabit Ethernet Backbone und Fast Ethernet Peripherie, verteilt auf 9 Knoten in 3 Gebäuden mit ca. 170 Twisted Pair Anschlüssen und 16 WLAN Access Points
- 2 Virtualisierungshosts mit 16 virtuellen Servern sowie 2 konventionelle Server, teils für zentrale Dienste, teils als Terminal Server für die Arbeitsplätze
- Im Wissenschaftsbereich 11 fest installierte Arbeitsplätze, ca. 18 Laptoparbeitsplätze, 11 Zimmer mit Netzwerkanschluß, WLAN
- 16 Arbeitsplätze im Verwaltungsbereich

Software

Auf dem allen Gastforschern zugänglichen Computeserver sind etwa 10 der am meisten nachgefragten wissenschaftlichen Softwaresysteme installiert, sowohl kommerzielle wie Maple, Mathematica und Magma als auch freie wie Singular, GAP, Cocoa und Surfer. Für den Tagungsbetrieb am MFO nutzen die Mitarbeiter die datenbankgestützte Software owconf (s. 3.3.2.). Ferner wird die Finanzbuchhaltungs- und Finanzplanungssoftware Office Line Evolution der Firma Sage sowie mit Unterstützung des Bibliotheksservicezentrums des Südwestdeutschen Bibliotheksverbundes (BSZ) die Bibliothekssoftware Horizon am MFO eingesetzt.

3.3.2. owconf

Die Oberwolfach Conference Management Software „owconf" vereinigt Anforderungen aus den Bereichen Veranstaltungsmanagement, Hotelmanagement und wissenschaftliches Management (Begutachtung, Publikationen) und bildet damit das softwaremäßige Rückgrat des Institutsbetriebs. Wegen der speziellen Anforderungen und wegen der Notwendigkeit künftiger Anpassungen und Erweiterungen erfolgte die Entwicklung durch die IT des MFO selbst.

Technisch gesehen besteht owconf aus einer Datenbank (postgresql), einer objektorientierten Abstraktionsschicht (sqlalchemy) und einem Webframework (rum). Als Programmiersprache wurde durchgängig Python verwendet. Alle eingesetzte Software ist frei und quelloffen. Die

3.3.1. Stock by the end of 2013

Hardware

- Redundant Internet connection via the Deutsches Forschungsnetz (DFN-Verein) with two 100 Mbit/s leased lines.
- Local Area Network with Gigabit Ethernet backbone and Fast Ethernet periphery, distributed over 3 buildings with 9 nodes with about 170 Twisted Pair connectors and 16 wireless access points
- 2 virtualisation hosts with 16 virtual servers plus 2 conventional servers, partly for central services, partly as terminal servers for the workplaces
- The scientific subnet offers 11 fixed terminals, ca. 18 workplaces for laptops, 11 rooms with network connection, and wireless network
- 16 workplaces in the administrative subnet

Software

About 10 of the most popular mathematical software systems are installed on a dedicated application server accessible to all guest researchers. Among the systems installed are both commercial ones like Maple, Mathematica, and Magma and freely distributed ones like Singular, GAP, Cocoa and Surfer. The staff uses throughout the databased conference management software owconf (see 3.3.2.). Furthermore, the administration uses the financial accounting and planning software Sage OfficeLine Evolution, and, supported by the Bibliotheksservicezentrum of the Südwestdeutscher Bibliotheksverbund (BSZ), the librarian software Horizon.

3.3.2. owconf

The Oberwolfach Conference Management Software "owconf" combines requirements from the fields of event management, hotel management and scientific management (reviewing, publications) and thus forms the software backbone of the management of the MFO. Because of the special requirements and due to the need of further adjustements and extensions the software was developped by the MFO IT staff itself.

Technically owconf consists of a database (postgresql), an object-oriented abstraction layer (sqlalchemy) and a web framework (rum). owconf was implemented consistently in Python. All utilized software is free and open source. Guests may access owconf via the Institute's

Nutzung durch die Gäste ist in die Webseiten des MFO integriert, die Verwaltungsmitarbeiter greifen über eine plattformunabhängige Weboberfläche zu.

website. Managing employees access owconf via a platform independent web interface.

Die Software owconf ist seit Dezember 2012 im produktiven Einsatz. 2013 wurden viele kleinere Fehler behoben und die Nutzerfreundlichkeit verbessert. Gleichzeitig kam als Erweiterung die Antragsverwaltung hinzu.

The software owconf is in use since december 2012. During the year 2013 numerous small bugs have been corrected. At the same time the functionality has been expanded to handle the proposals of the different kinds of activities.

3.3.3. Weitere Aktivitäten in 2013

Wegen des Supportendes für Windows XP durch Microsoft wurden sämtliche PCs nach Windows 7 migriert. Die Verwaltungsarbeitsplätze wurden durch die Einführung eines Active Directory Servers und eines Citrix-Servers zentralisiert. Der Wartungsaufwand konnte dadurch reduziert und die Aktualität der eingesetzten Software verbessert werden. Im Gästebereich wurde die Verfügbarkeit des WLAN deutlich erweitert. Schließlich wurde die Bandsicherung durch ein neues System mit der achtfachen Kapazität ersetzt.

3.3.3. Further activities in 2013

As Microsoft ceased to supply security patches for Windows XP, the Institute's PCs were migrated to Windows 7. The working environment of the employees has been centralized by introducing an Active Directory server and a Citrix server. This led to reduced effort for maintenance and to the use of more current software. The availability of WiFi for guests has been significantly expanded. Finally the tape backup has been replaced by a new system with an eightfold capacity.

3.4. Verwaltung und Hauswirtschaft

Aufgrund der Beschlüsse der Gemeinsamen Wissenschaftskonferenz (GWK) erstellt das MFO als Mitglied der Leibniz-Gemeinschaft seit dem Haushaltsjahr 2006 ein Programmbudget als Grundlage für die gemeinsame Finanzierung durch Bund und Länder.

3.4. Administration and Housekeeping

According to the resolution of the Joint Science Conference (Gemeinsame Wissenschaftskonferenz GWK), the MFO as a member of the Leibniz-Gemeinschaft, has established a budget-plan since 2006 as a basis for the common financing by the federation of Germany and the federal states.

Das Tagungsgebäude liegt dem Gästehaus direkt gegenüber und wurde mit Mitteln der VolkswagenStiftung erbaut. Es bietet den Forschungsgästen exzellente Arbeitsmöglichkeiten und umfasst die Bibliothek, mehrere Vortragsräume sowie Computerarbeitsplätze. Ferner ist die wissenschaftliche Verwaltung dort untergebracht. Im Mai 2007 konnte der Erweiterungsbau der Bibliothek, finanziert von der Klaus Tschira Stiftung und der VolkswagenStiftung, feierlich eingeweiht werden. Die Nähe von Tagungsgebäude und Gästehaus erweist sich als sehr effizient, bietet sie den Wissenschaftlern doch rund um die Uhr die Möglichkeit zu kreativer Arbeit, was intensiv genutzt wird. Im Frühjahr 2010 wurde die Sanierung des Gästehauses abgeschlossen.

The library building is located immediately opposite the guest house and was built with funds from the VolkswagenStiftung. Hosting the library, several lecture halls and numerous computer stations it offers excellent working conditions for scientific research. The offices of the scientific administration are also part of this building. The extension of the library, funded by the Klaus Tschira Stiftung and the VolkswagenStiftung was ceremonially inaugurated in may 2007. The short distance between the guest house and the library building has proofed very convenient as it offers scientists the possibility to work at any time, which is used extensively. Since spring 2010 the renovation measures in the guest house have been terminated.

Der Verwaltungsbereich umfasst derzeit 11,72 besetzte Stellen für die wissenschaftliche Verwaltung (Organisation der Workshops, Öffentlichkeitsarbeit, Drittmittelprojekte), die Bibliothek, die IT sowie für die allgemeine Verwaltung (Finanzverwaltung, Beschaffungswesen,

The administration encompasses at the moment 11.72 positions, covering scientific administration (planning and organisation of the scientific programme, public relation, third-party projects), library, IT-services and general administration (financial management, purchasing,

Personalsachbearbeitung, Vertragswesen, usw.) und die Gästebetreuung.

Der Hauswirtschaftsbereich des Instituts unterstützt die Durchführung der wissenschaftlichen Programme, indem die Gastforscher im Gästehaus des Instituts Unterkunft und Verpflegung erhalten. Das Gästehaus wurde mit Mitteln der VolkswagenStiftung erbaut und 1967 eingeweiht. Die Wissenschaftler sind überwiegend in Einzelzimmern untergebracht, jedoch gibt es auch 8 größere Appartements sowie 5 Bungalows. Dadurch sind auch längere Aufenthalte im Rahmen des RiP-Programmes und des Oberwolfach-Leibniz-Fellows-Programmes möglich. Der Hauswirtschaftsbereich umfasst insgesamt 13 Stellen für Küche und Zimmerservice sowie für die Pflege von Gebäuden und Grundstück.

personnel administration, contracts, renovation measures etc.) as well as guest liaison and support.

Since board and lodging is provided by the Institute, housekeeping is also an important part of the realisation of the scientific programme at the MFO. The guest house was built with funds from the VolkswagenStiftung and inaugurated in 1967. Accommodation of the scientists is mainly provided in single rooms. In addition to that, 8 apartments and 5 bungalows enable a longer stay at the MFO within the Research in Pairs programme and the Oberwolfach-Leibniz-Fellows programme. The housekeeping department comprises 13 positions for kitchen and room service as well as for the maintenance of the buildings and premises.

3.5. Finanzielle Übersicht

Gesamtübersicht

Erlöse 2013 (gerundet auf 1.000 €)	
Zuwendung Bund/Länder (inklusive Mittel für Bausanierung)	
Drittmittel	
Spenden	
sonstige Einnahmen	
zweckgebunde Reste aus 2012	
Summe Erlöse	

Aufwendungen 2013 (gerundet auf volle 1.000 €)	
Personalausgaben	
Materialaufwand	
Aufwand für bezogene Leistungen	
Abschreibungen	
sonstige Aufwendungen (inklusive Sachausgaben Bibliothek)	
Rückstellungen für zweckgebundene Reste	
Investitionen	
Summe Aufwendungen	

3.5. Financial Overview

General Overview

Revenues 2013 (rounded)		
Benefits from the federation and federal states		2.835.000
Third party funds		949.000
Donations		86.000
Other income		141.000
Earmarked surpluses		25.000
Total revenues:		**4.036.000**

Expenses 2013 (rounded)	
Personnel department	1.451.000
Purchases	319.000
Expenses for drawn benefits	171.000
Consumption of fixed capital	108.000
Other Expenses (with material expenses for the library)	1.519.000
Provisions for earmarked surpluses	417.000
Investments	51.000
Total expenses:	**4.036.000**

Erläuterungen

Die Drittmittel wurden dem Haushaltsjahr zugerechnet, für das sie zugewiesen wurden.

Der Anteil von Drittmitteln, Spenden und sonstigen Einnahmen bezogen auf die Gesamtsumme der Erlöse liegt im Haushaltsjahr 2013 bei 29%. Die zweckgebundenen Reste aus 2012 sind dabei nicht berücksichtigt.

Öffentliche Mittel

Das MFO erhielt im Haushaltsjahr 2013 insgesamt 2,835 Mio. Euro Zuwendung von Bund und Ländern.

Drittmittel

Die projektbezogenen Drittmittel rekrutierten sich im Haushaltsjahr 2013 insbesondere aus Mitteln der Deutschen Forschungsgemeinschaft (DFG), der National Science Foundation (NSF), der Carl Friedrich von Siemens Stiftung, der Klaus Tschira Stiftung und aus Mitteln aus dem Wettbewerbsfonds der Leibniz Gemeinschaft für das Projekt swMATH.

Förderverein und Oberwolfach Stiftung

Zweckgebundene Spenden erhielt das MFO auch im Haushaltsjahr 2013 vom Förderverein und der Oberwolfach-Stiftung. Die Gelder wurden für Reisekostenzuschüsse in besonderen Fällen, als Zuschuss zu Baumaßnahmen und als Zuschuss für die Beschaffung von Büchern verwendet.

3.6. Dank

Ein besonders herzliches Dankeschön gilt den Zuwendungsgebern (Bund und Länder). Weiter gilt unser Dank allen Drittmittelgebern wie der Klaus Tschira Stiftung, der Deutschen Forschungsgemeinschaft (DFG), der Carl Friedrich von Siemens Stiftung, der National Science Foundation (NSF) und der Japan Association for Mathematical Sciences (JAMS). Und ein Dankeschön natürlich auch an den Förderverein und die Oberwolfach Stiftung für die großzügige Unterstützung des MFO.

Explanations

The third party funds were attributed to the fiscal year they were assigned to.

The proportion of private resources (own income, third-party-funds and donations) of the total sum of revenues is 29%. Funds carried forward from 2012 are disregarded here.

Public Funding

In the fiscal year 2013 the MFO received 2.835 million Euro funding from the federation and the federal states.

Third-party funds

Earmarked third party funds in the fiscal year 2013 are mainly composed of the grants from the Deutschen Forschungsgemeinschaft (DFG), the National Science Foundation (NSF), the Carl Friedrich von Siemens Foundation, the Klaus Tschira Foundation and the Competition Fund of the Leibniz Association.

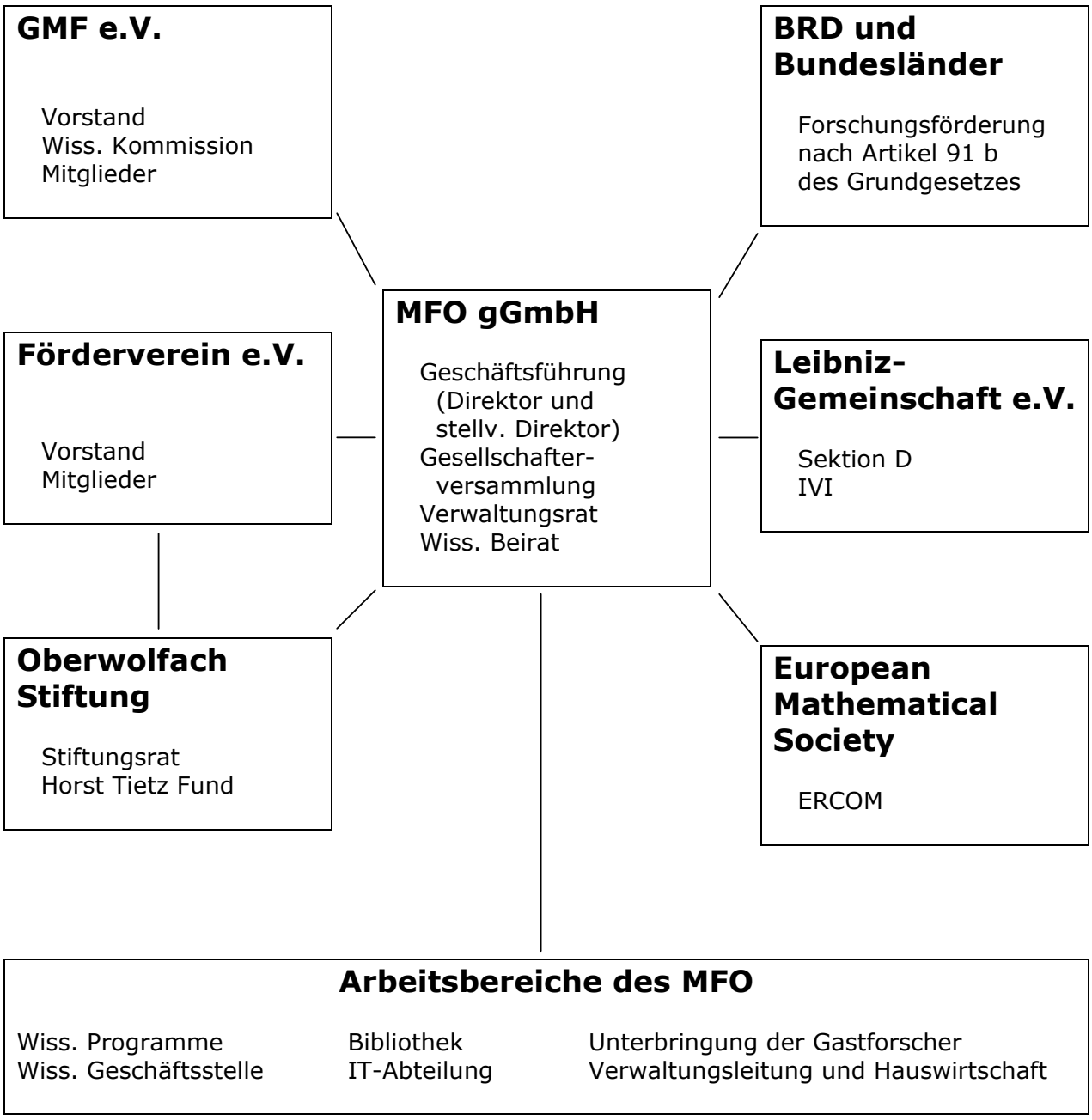
Förderverein and Oberwolfach Stiftung

Earmarked donations have been received by the Förderverein and the Oberwolfach Stiftung. These funds have been used to support travel costs for scientists in special cases, as additional support for building measures and for the support of buying books.

3.6. Acknowledgement

A particular thank-you goes to the Federation and the federal state of Baden-Württemberg for their financial support. We would also like to thank for the third-party funds received from the Klaus Tschira Foundation, the Deutsche Forschungsgemeinschaft (DFG), the Carl Friedrich von Siemens Stiftung, the National Science Foundation (NSF) and the Japan Association for Mathematical Sciences (JAMS). Our special thank-you also goes to the Förderverein and the Oberwolfach Foundation for their important support of the MFO.

3.7. Organigramm des Mathematischen Forschungsinstituts Oberwolfach



Erläuterungen

Das Mathematische Forschungsinstitut Oberwolfach (MFO) ist seit April 2005 eine gemeinnützige GmbH. Die Geschäftsführung des MFO besteht aus Direktor und stellvertretendem Direktor. Alleiniger Gesellschafter des MFO ist die Gesellschaft für Mathematische Forschung e.V. (GMF), die durch ihren Vorstand vertreten wird. Das MFO wird von der Bundesrepublik Deutschland und den Bundesländern im Rahmen der Forschungsförderung nach Artikel 91b des Grundgesetzes gemeinschaftlich finanziert, wobei das Sitzland Baden-Württemberg eine besondere Rolle einnimmt. Dabei ist die Mitgliedschaft des MFO in der Leibniz-Gemeinschaft Bestandteil der gemeinschaftlichen Finanzierung. Die Zuwendungsgeber sind im Verwaltungsrat des MFO vertreten, der als wichtigstes Aufsichtsgremium über die mittel- und langfristige Finanz- und Budgetplanung entscheidet. Institut und Verwaltungsrat werden dabei vom wissenschaftlichen Beirat des MFO beraten, dem 6 bis 8 international angesehene Mathematiker angehören. Ferner ist das MFO Mitglied in ERCOM (European Research Centres on Mathematics), einem Komitee der European Mathematical Society.

Die Gesellschaft für Mathematische Forschung e.V. (GMF) hat ca. 80 Mitglieder, darunter die drei institutionellen Mitglieder DMV (Deutsche Mathematiker-Vereinigung), GAMM (Gesellschaft für angewandte Mathematik und Mechanik) und Förderverein. Die GMF ist Eigentümer des Grundstücks und der Institutsgebäude des MFO. Der Vorstand der GMF besteht aus dem Vorstandsvorsitzenden, dem Schatzmeister und dem Vorsitzenden der wissenschaftlichen Kommission. Die wissenschaftliche Kommission der GMF besteht aus ca. 20 - 25 international angesehenen Mathematikern und ist in Abstimmung mit der Geschäftsführung des MFO zuständig für die Forschungs- und Entwicklungsplanung sowie die aktuelle wissenschaftliche Arbeitsplanung des MFO.

Der Verein zur Förderung des Mathematischen Forschungsinstituts Oberwolfach e.V. (Förderverein) hat mehr als 700 Mitglieder, die das MFO durch Mitgliedsbeiträge zusätzlich finanziell unterstützen. Die Oberwolfach Stiftung, die im Förderverein als nicht rechtsfähige Stiftung gegründet wurde, sammelt Stiftungskapital aus dem wirtschaftlichen und dem privaten Bereich. Dabei spielt der Horst Tietz Fund als Sondervermögen innerhalb der Oberwolfach Stiftung eine besondere Rolle. Die Erträge des Stiftungskapitals kommen dem MFO zu Gute.

Explanations

Since April 2005 the Mathematisches Forschungsinstitut Oberwolfach has been registered as a non-profit corporation (gemeinnützige GmbH). The MFO is headed by a Director supported by a Vice Director. The sole associate of the MFO is the Gesellschaft für Mathematische Forschung e.v. (GMF), represented by its board. Financing of the MFO is shared by the Federal Republic of Germany and the Federal States according to article 91b (research financing) of the Basic Law of the Federal Republic of Germany with emphasis on the local state of Baden-Württemberg. Being a member of the Leibniz Association is a prerequisite for the common financing. The financial partners are represented in the Administrative Council (Verwaltungsrat) of the MFO, which in its function as most important supervisory panel decides on the medium- and long-term finance- and budget planning. The Institute and the Administrative Council are supported by the Scientific Advisory Board (wissenschaftlicher Beirat) which is composed of 6 to 8 internationally renowned mathematicians. Moreover, the MFO is a member of ERCOM (European Research Centres on Mathematics), a committee of the European Mathematical Society.

The Gesellschaft für Mathematische Forschung e.V. (GMF) consists of about 80 members, including three institutional members, namely DMV (Deutsche Mathematiker-Vereinigung), GAMM (Gesellschaft für angewandte Mathematik und Mechanik) and the Förderverein. The GMF is the legal owner of the site and of the buildings of the MFO, and the head of the society is formed by the chairman, the treasurer, and the chairman of the Scientific Committee. The Scientific Committee of the GMF is composed of about 20 to 25 internationally renowned mathematicians and is responsible for the research and development planning, as well as for running decisions on scientific proposals, in agreement with the head of the MFO.

The "Verein zur Förderung des Mathematischen Forschungsinstituts Oberwolfach e.V." (Förderverein) has more than 700 members and provides additional financial support for the MFO by its membership fees. The Oberwolfach Foundation (Oberwolfach Stiftung), a foundation of public utility within the Förderverein, provides further financial support by economic and private means. Within the Oberwolfach Foundation the Horst Tietz Fund plays an important role by providing special funds.

Beschäftigte des MFO — Staff of the MFO — 2013

Wissenschaftliche Verwaltung	**Scientific Administration**	
Direktor	Director	Prof. Dr. Dr. h.c. Gert-Martin Greuel (bis März 2013) Prof. Dr. Gerhard Huisken (ab April 2013)
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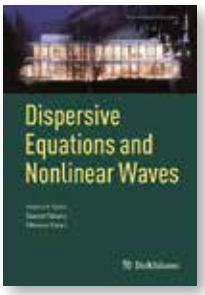

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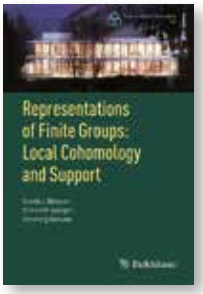

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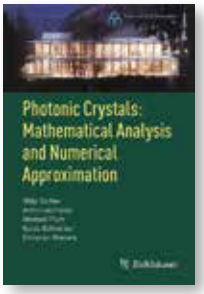

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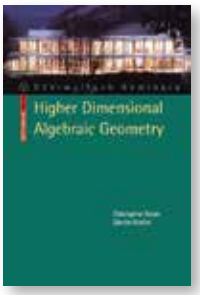

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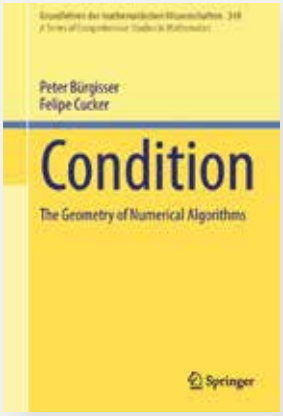

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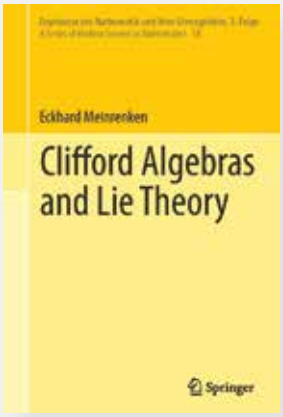

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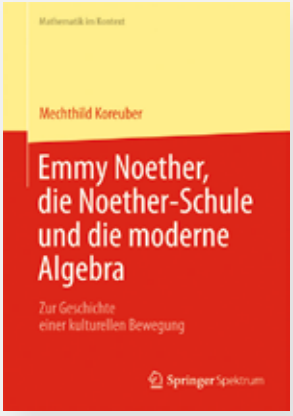

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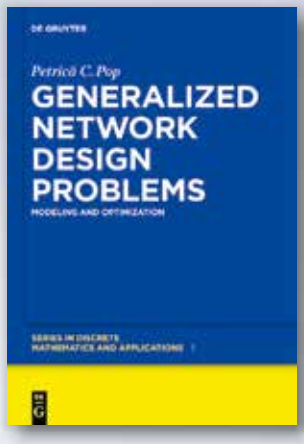

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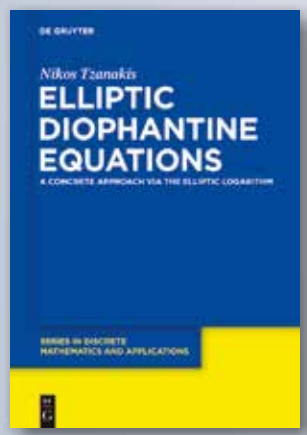

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The Defocusing NLS Equation and Its Normal Form (EMS Series of Lectures in Mathematics)

ISBN 978-3-03719-131-6. March 2014. 176 pages. Softcover. 17 x 24 cm. 32.00 Euro

The theme of this monograph is the nonlinear Schrödinger equation. This equation models slowly varying wave envelopes in dispersive media and arises in various physical systems such as water waves, plasma physics, solid state physics and nonlinear optics. More specifically, this book treats the defocusing nonlinear Schrödinger (dNLS) equation on the circle with a dynamical systems viewpoint. By developing the normal form theory it is shown that this equation is an integrable partial differential equation in the strongest possible sense. In particular, all solutions of the dNLS equation on the circle are periodic, quasi-periodic or almost-periodic in time and Hamiltonian perturbations of this equation can be studied near solutions far away from the equilibrium.
The book is not only intended for specialists working at the intersection of integrable PDEs and dynamical systems, but also for researchers farther away from these fields as well as for graduate students. It is written in a modular fashion, each of its chapters and appendices can be read independently of each other.

Emmanuel Hebey (Université de Cergy-Pontoise, France)
Compactness and Stability for Nonlinear Elliptic Equations (Zurich Lectures in Advanced Mathematics)

ISBN 978-3-03719-134-7. 2014. 304 pages. Softcover. 17 x 24 cm. 42.00 Euro

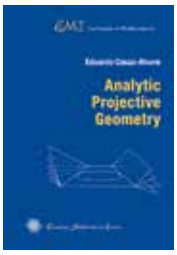
The book offers an expanded version of lectures given at ETH Zürich in the framework of a Nachdiplomvorlesung. Compactness and stability for nonlinear elliptic equations in the inhomogeneous context of closed Riemannian manifolds are investigated, a field presently undergoing great development. The author describes blow-up phenomena and presents the progress made over the past years on the subject, giving an up-to-date description of the new ideas, concepts, methods, and theories in the field. Special attention is devoted to the nonlinear stationary Schrödinger equation and to its critical formulation.
Intended to be as self-contained as possible, the book is accessible to a broad audience of readers, including graduate students and researchers.

Robert J. Marsh (University of Leeds, UK)
Lecture Notes on Cluster Algebras (Zurich Lectures in Advanced Mathematics)
978-3-03719-130-9. 2013. 132 pages. Softcover. 17 x 24 cm. 28.00 Euro

The aim of these notes is to give an introduction to cluster algebras which is accessible to graduate students or researchers interested in learning more about the field, while giving a taste of the wide connections between cluster algebras and other areas of mathematics.
The approach taken emphasizes combinatorial and geometric aspects of cluster algebras. Cluster algebras of finite type are classified by the Dynkin diagrams, so a short introduction to reflection groups is given in order to describe this and the corresponding generalized associahedra. A discussion of cluster algebra periodicity, which has a close relationship with discrete integrable systems, is included. The book ends with a description of the cluster algebras of finite mutation type and the cluster structure of the homogeneous coordinate ring of the Grassmannian, both of which have a beautiful description in terms of combinatorial geometry.

Isabelle Gallagher (Université Paris-Diderot, France), Laure Saint-Raymond (Université Pierre et Marie Curie, Paris) and Benjamin Texier (Université Paris-Diderot, France)
From Newton to Boltzmann: Hard Spheres and Short-range Potentials (Zurich Lectures in Advanced Mathematics)
978-3-03719-129-3. 2013. 150 pages. Softcover. 17 x 24 cm. 32.00 Euro

The question addressed in this monograph is the relationship between the time-reversible Newton dynamics for a system of particles interacting via elastic collisions, and the irreversible Boltzmann dynamics which gives a statistical description of the collision mechanism. Two types of elastic collisions are considered: hard spheres, and compactly supported potentials.
Following the steps suggested by Lanford in 1974, we describe the transition from Newton to Boltzmann by proving a rigorous convergence result in short time, as the number of particles tends to infinity and their size simultaneously goes to zero, in the Boltzmann-Grad scaling.
This book is intended for mathematicians working in the fields of partial differential equations and mathematical physics, and is accessible to graduate students with a background in analysis.



Eduardo Casas-Alvero (Universitat de Barcelona, Spain)
Analytic Projective Geometry (EMS Textbooks in Mathematics)

ISBN 978-3-03719-138-5. 2014. 636 pages. Hardcover. 16.5 x 23.5 cm. 58.00 Euro

This book contains a comprehensive presentation of projective geometry, over the real and complex number fields, and its applications to affine and Euclidean geometries. It covers central topics such as linear varieties, cross ratio, duality, projective transformations, quadrics and their classifications – projective, affine and metric –, as well as the more advanced and less usual spaces of quadrics, rational normal curves, line complexes and the classifications of collineations, pencils of quadrics and correlations. Two appendices are devoted to the projective foundations of perspective and to the projective models of plane non-Euclidean geometries.
The presentation uses modern language, is based on linear algebra and provides complete proofs. Exercises are proposed at the end of each chapter; many of them are beautiful classical results.
The material in this book is suitable for courses on projective geometry for undergraduate students, with a working knowledge of a standard first course on linear algebra. The text is a valuable guide to graduate students and researchers working in areas using or related to projective geometry.

MATHEON – Mathematics for Key Technologies (EMS Series in Industrial and Applied Mathematics, Vol. 1)
Peter Deuflhard, Martin Grötschel, Frank Schmidt (all Konrad-Zuse-Zentrum, Berlin, Germany), Dietmar Hömberg, Volker Mehrmann, Martin Skutella (all Technische Universität Berlin, Germany), Ulrich Horst, Jürg Kramer (both Humboldt-Universität zu Berlin, Germany), Konrad Polthier, Christof Schütte (both Freie Universität Berlin, Germany) and Jürgen Sprekels (Weierstraß Institut für Angewandte Analysis und Stochastik, Berlin, Germany), Editors

978-3-03719-137-8. 2014. 466 pages. Hardcover. 17 x 24 cm. 48.00 Euro

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