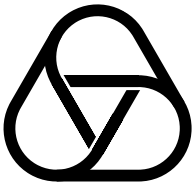
Mathematisches
Forschungsinstitut
Oberwolfach

Mitglied der Leibniz Gemeinschaft

Jahresbericht 2022
Annual Report



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Jahresbericht 2022 – Annual Report 2022

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Gerhard Huisken (Photo: Gerd Fischer)

Vorwort des Direktors

Das Jahr 2022 war zweifellos eine Zeit der Umbrüche und Veränderungen, in der wir sowohl mit ermutigenden Entwicklungen als auch mit neuen Herausforderungen konfrontiert waren.

Ermutigend war zunächst das Nachlassen der Corona-Pandemie. Im Verlauf des Jahres konnten immer mehr Forscherinnen und Forscher wieder persönlich nach Oberwolfach reisen und das Institut konnte Schritt für Schritt zu den bewährten Veranstaltungsformaten in Präsenz zurückkehren. Für Einzelfälle, in denen Personen aufgrund staatlicher Beschränkungen oder aus schwerwiegenden persönlichen Gründen nicht reisen können, werden wir die Möglichkeit beibehalten, eine begrenzte Anzahl ausgewählter Online-Teilnehmer einladen zu können. Ebenso werden wir das Konzept der Tandem-Workshops weiter verfolgen. Mit diesem in der Corona-Pandemie neu eingeführten Format konnten wir inzwischen einige Erfahrungen sammeln und betrachten sie als eine Ergänzung unseres Miniworkshop-Programms, mit der interkontinentale Flugreisen reduziert werden können.

Erschütternd war hingegen der Angriff Russlands auf die Ukraine im Februar 2022. Die Auswirkungen dieses Krieges machten sich schnell

Director’s foreword

The year 2022 was undoubtedly a time of disruption and change, in which we faced both encouraging developments and new challenges.

Very encouraging was the ease of the corona pandemic. Over the course of the year, more and more researchers have been able to travel to Oberwolfach in person and the Institute has been able to gradually return to the long-established formats of in-person-events. For individual cases, in which people are unable to travel due to government restrictions or for severe personal reasons, we will maintain the possibility for organizers to invite a limited number of selected online-participants. We will continue to explore the new concept of Tandem-Workshops. We could gather some experience now with this format and consider it as a supplement to our Mini-Workshop program that can help to reduce intercontinental air travel for selected events.

Deeply shaking was, on the other hand, Russia’s attack on Ukraine in February 2022. The effects of this war quickly affected the academic world.

auch in der akademischen Welt bemerkbar. Das MFO konnte einzelne aus der Ukraine geflüchtete Mathematikerinnen und Mathematiker im Rahmen des Programms Oberwolfach Research Fellows durch flexible Interimslösungen unterstützen. Die Teilnahme russischer Mathematiker an den Programmen des MFO konnte meist auf individueller Basis ermöglicht werden.

The MFO could support individual mathematicians who had fled Ukraine with flexible interim solutions as part of the Oberwolfach Research Fellows program. The participation of Russian mathematicians in Oberwolfach programs was made possible on an individual basis.

Die mit dem Krieg einhergehende Energiekrise stellte viele Forschungseinrichtungen vor große Herausforderungen. Dank einer eigenen Holzhackschnitzel-Heizungsanlage, die bereits seit 2014 in Betrieb ist, und dank der neuen Photovoltaikanlage, die im Dezember 2021 auf dem Dach der Bibliothek installiert wurde, war das MFO von den steigenden Energiepreisen nur mäßig betroffen. Das Institut wird seine Bestrebungen in diesem Bereich fortsetzen und weiter in Nachhaltigkeit und Versorgungssicherheit investieren.

The energy crisis that accompanied the war posed major challenges for many research institutions. Thanks to its own woodchip heating system, which has been in operation since 2014, and thanks to the new photovoltaic system installed on the roof of the library in December 2021, the MFO was only moderately affected by rising energy prices. The Institute will continue its efforts in this area and further invest in sustainability and security of supply.

Die finanziellen Spielräume für solche Infrastruktur verdanken wir unter anderem dem Förderverein des MFO und der Oberwolfach Stiftung. Ein herzliches Dankeschön an alle, die sich dort engagieren!

We owe the financial leeway for such infrastructure measures, among others, to the Friends of Oberwolfach and the Oberwolfach Foundation. A big thank you to everyone who is involved there!

Ich bedanke mich außerdem bei unseren Zuwendungsgebern aus Bund und Ländern, die den Löwenanteil unserer jährlichen Haushaltsmittel bereitstellen. Unseren Drittmittelgebern, der Carl Friedrich von Siemens Stiftung, der National Science Foundation der USA und der Simons Foundation danke ich für die Unterstützung unserer Forschungsgäste, insbesondere der Nachwuchskräfte, bei den Reisekosten.

I would also like to thank our funding agencies at the federal and state levels for providing the lion's share of our annual budget. Many thanks also to our third party donors, the Carl Friedrich von Siemens Foundation, the US National Science Foundation, and the Simons Foundation for supporting our guests, in particular early career researchers, with travel expenses.

Eine große Herausforderung stellt der zunehmende Fachkräftemangel dar, der das MFO vor allem in den Bereichen IT und Hauswirtschaft betrifft. In der IT ist es uns gelungen, einen bestehenden Personalengpass durch die Zusammenarbeit mit einem externen Unternehmen vorerst abzufedern. In der Hauswirtschaft sind die Möglichkeiten der Zusammenarbeit mit externen Dienstleistern derzeit weitgehend ausgeschöpft. Um den Arbeitsumfang entsprechend der verfügbaren personellen Kapazität zu reduzieren, muss das MFO deshalb seine Beherbergungskapazität anpassen – eine Maßnahme, die mit Beginn des Jahres 2023 eingeführt wird.

The increasing shortage of skilled workers, which affects the MFO especially in the areas of IT and housekeeping, poses a major challenge. In the IT section, we have gladly managed to cushion an existing staff shortage through cooperation with an external company. In housekeeping, the possibilities of working with external service providers are currently largely exhausted. In order to reduce the scope of work in line with the available human resources, the MFO must therefore adjust its accommodation capacity – a measure that is introduced at the beginning of 2023.

Ich möchte mich bei allen Mitarbeiterinnen und Mitarbeitern bedanken, die Tag für Tag für einen reibungslosen Betrieb an unserem Institut sorgen. Wieviel im Hintergrund geschieht, damit alle Gäste sich wohlfühlen und sich auf ihre Forschung konzentrieren können, ist nach außen oft kaum ersichtlich.

I would like to thank all employees who ensure that our Institute runs smoothly every day. The many processes in the background which ensure that all guests feel comfortable and can concentrate on their research are hardly visible from the outside.

Zu guter Letzt danke ich allen ehrenamtlichen Mitgliedern in den Gremien des Instituts für ihre wertvolle Expertise und ihre Zeit, die sie dem MFO zur Verfügung stellen. Ihr Einsatz trägt ganz maßgeblich zum Erfolg des Instituts bei. Auch für 2022 gibt es wieder hervorragende Arbeitsergebnisse zu berichten, wie der Überblick über das Forschungsprogramm und die weiteren Aktivitäten des Instituts auf den nachfolgenden Seiten zeigen.

Last but not least, I would like to thank the many honorary members of the Institute's committees for their invaluable expertise and their time that they donate to the MFO. Their commitment contributes significantly to the success of the Institute. Again, there are excellent work results to report for 2022, as the overview of the research program and the Institute's other activities on the following pages shows.

Gerhard Huisken

1. Institutsnachrichten

1.1. Unterstützung für ukrainische Wissenschaftler

Der Beginn des Krieges in der Ukraine im Februar 2022 zwang Millionen von Menschen zur Flucht, darunter auch ukrainische Wissenschaftlerinnen und Wissenschaftler sowie zahlreiche Studierende und Forschende aus Drittstaaten. Die Allianz der Wissenschaftsorganisationen in Deutschland erklärte umgehend ihre Solidarität mit den Menschen in der Ukraine und bekräftigte ihre Entschlossenheit, geflüchtete Studierende und Akademiker im Rahmen von Förderprogrammen zu unterstützen. Dem schloss sich das MFO ausdrücklich an.

Im Rahmen der Langzeit-Programme Oberwolfach Research Fellows und Oberwolfach Leibniz Fellows ermöglicht das Institut seit März 2022 besonders flexible Lösungen für aus der Ukraine geflüchtete Mathematikerinnen und Mathematiker, insbesondere bezüglich der Aufenthaltsdauer. Über das Unterstützungsangebot informierte das Institut auf seiner eigenen Webseite, auf der neu eingerichteten Hilfeseite der ERCOM, sowie direkt per Email an mit dem Institut in Kontakt stehende ukrainische Wissenschaftlerinnen und Wissenschaftler.

Die Oberwolfach Leibniz Fellowship half einer Promotionsstudentin aus Charkiw dabei, ihre Doktorarbeit in Deutschland fortzusetzen und sie später an der Universität Leipzig erfolgreich abzuschließen.

1.2. Kooperation mit CIMPA und ICTP

Das MFO engagiert sich als deutsches Partnerzentrum für das CIMPA-ICTP Fellowship Programm „Research in Pairs", das vom Centre International de Mathématiques Pures et Appliquées (CIMPA) und dem International Center for Theoretical Physics (ICTP) ins Leben gerufen wurde. Das Programm ermöglicht es Forschenden aus einem Entwicklungsland nach Europa zu kommen, um mit einem Kollegen oder einer Kollegin zusammen zu arbeiten. Die Arbeit an einem fundierten Forschungsprojekt erfolgt hauptsächlich im Heimatinstitut des europäischen Kollegen. Eine Woche kann an einem der Partnerinstitute des Gastlands verbracht werden.

Dank langjähriger Erfahrungen mit eigenen Fellowship-Programmen verfügt Oberwolfach über ideale Strukturen und Einrichtungen für solche Gastaufenthalte und bietet hervorragende Arbeitsbedingungen. Erfreulicherweise konnte das

1. News from the Institute

1.1. Support for Ukrainian scientists

The beginning of the war in Ukraine in February 2022 forced millions of people to leave the country, including Ukrainian scientists and numerous students and researchers from third countries. The Alliance of Science Organizations in Germany immediately declared its solidarity with the people of Ukraine and reaffirmed its determination to support refugee students and academics by extensive funding programs. The MFO strongly agreed with the statement of the Alliance.

As part of the longer-term programs Oberwolfach Research Fellows and Oberwolfach Leibniz Fellows, since March 2022, the Institute has been providing particularly flexible solutions for mathematicians who have fled Ukraine, especially with regard to the duration of the stay in Oberwolfach. The Institute provided information about the support on its own website, on the newly established ERCOM help page, and directly by email to Ukrainian scientists who were in contact with the Institute.

The Oberwolfach Leibniz Fellowship helped a doctoral student from Kharkiv to continue her doctorate in Germany and later successfully complete it at Leipzig University.

1.2. Cooperation with CIMPA and ICTP

The MFO engages as the German partner center for the CIMPA-ICTP Fellowships program "Research in Pairs" launched by the Centre International de Mathématiques Pures et Appliquées (CIMPA) and the International Center for Theoretical Physics (ICTP). The pogram enables researchers in mathematics based in a developing country to come to Europe to collaborate with a colleague. These two persons will work together on a well-substantiated research project, mainly in the institute of the European colleague. The laureate and his/her colleague may propose to carry out part of their collaboration during a week at one of the partner centers located in the host's country.

Thanks to longstanding experiences with its own fellowship programs Oberwolfach comes with ideal structures and facilities for such guest research stays and provides excellent working conditions. Fortunately, the Institute was able

Institut neben seinen eigenen wissenschaftlichen Programmen die Kapazität für die Unterbringung von zwei Forscherpaaren im Jahr 2023 anbieten.

to offer the capacity for hosting two pairs of researchers in 2023, next to its own scientific programs.

1.3 Oberwolfach Vorlesung

Jedes Jahr im Oktober findet anlässlich der Zusammenkunft der Gremien des Instituts eine besondere Vorlesung statt. Diese traditionelle Oberwolfach Vorlesung wurde in diesem Jahr von Prof. Dr. Andreas Thom (TU Dresden) gehalten. Ein herzliches Dankeschön für den spannenden Vortrag!

1.3 Oberwolfach Lecture

Every year in October, a special lecture takes place on the occasion of the meeting of all committees of the Institute. This year, the traditional Oberwolfach Lecture was given by Prof. Dr. Andreas Thom (TU Dresden). Many thanks for the exciting lecture!

Approximation and Stability of Groups

Infinite discrete symmetry groups appear in many places in mathematics. A natural circle of questions arises when trying to approximate such groups by finite approximate symmetries. Is this kind of approximation always possible? When does such an approximation come from finite perfect symmetries? We will discuss Gromov's notion approximability, i.e. that of a sofic group, and various applications. Finally, we will briefly mention the recent break-through result MIP=RE, that implies a negative answer to Connes' Embedding Conjecture and has the potential to lead to the construction of a non-approximable group.*

1.4. Nachruf

Bas Edixhoven (1962-2022)

Photo: Gerd Fischer

Bas Edixhoven wurde am 12. März 1962 in Leiden geboren. Nach dem Studium der Mathematik in Utrecht, das er 1985 abschloss, promovierte er 1989 in Utrecht bei Frans Oort mit einer Arbeit über „Stable models of modular curves and applications". Von 1989 bis 1991 war er Morrey Assistant Professor an der UC Berkeley und danach Postdoktorand in Utrecht. Ab 1992 war er Professor in Rennes und ab 2002 Professor für Geometrie in Leiden. Er arbeitete auf den Gebieten der arithmetischen algebraischen Geometrie und der Modulformen. Hier hat er wichtige Beiträge zu den Techniken im Umfeld von Fermats letztem Satz und einer damit verbundenen Vermutung von Jean-Pierre Serre sowie für Spezialfälle der Vermutung von Yves André und Frans Oort über Untervarietäten von Shimura-Varietäten publiziert.

Er war seit 2003 Mitherausgeber von Zeitschriften wie Compositio Mathematica, Expositiones Mathematicae und des Journal of Number Theory sowie des Journal de Théorie des Nombres des Bordeaux. Er ist seit 2009 Mitglied der Niederländischen Akademie der Wissenschaften.

Seit 1989 war er häufiger Gast bei Oberwolfach-Tagungen in seinem Gebiet gewesen und von 2013-2016 war er Mitglied in der Wissenschaftlichen Kommission von Oberwolfach und der Gesellschaft für Mathematische Forschung. Bas Edixhoven war ein leidenschaftlicher akademischer Lehrer, der seine Einsichten gerne mit Kollegen und den etwa 30 Doktoranden, die er betreut hat, teilte.

Bas Edixhoven starb am 16. Januar 2022 nach kurzer schwerer Krankheit. Die Gesellschaft für Mathematische Forschung und das Mathematische Forschungsinstitut Oberwolfach werden ihn in dankbarer Erinnerung behalten.

Friedrich Götze
Vorstandsvorsitzender der GMF

2. Wissenschaftliches Programm

Das wissenschaftliche Programm wird vom Direktor in Zusammenarbeit mit der Wissenschaftlichen Kommission der Gesellschaft für Mathematische Forschung entschieden. Dieses Gremium basiert auf der ehrenamtlichen Arbeit von circa 20-25 hochkarätigen Mathematikern und Mathematikerinnen, welche die gesamte Breite der Mathematik vertreten. Die Wissenschaftliche Kommission begutachtet alle wissenschaftlichen Veranstaltungen des Instituts vor ihrer Genehmigung. 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 Aktivitäten

Die Aktivitäten des MFO gliedern sich in drei Teilbereiche: Kurzzeitige Forschungsveranstaltungen, längerfristige Forschungsaufenthalte und Fortbildungsveranstaltungen. Diese drei Bereiche sind in sechs zentralen wissenschaftlichen Programmen konkretisiert: Workshops und Miniworkshops, Oberwolfach Research Fellows und Oberwolfach Leibniz Fellows sowie Oberwolfach Arbeitsgemeinschaft und Oberwolfach Seminare. Im Rahmen dieser Programme gibt es spezielle Fördermöglichkeiten für den wissenschaftlichen Nachwuchs und etablierte Forscherinnen und Forscher.

Kurzzeitige Forschungsveranstaltungen

Workshops. Der Hauptteil des Jahresprogramms besteht aus etwa 40 einwöchigen Workshops pro Jahr, an denen jeweils ca. 50 Personen teilnehmen. Alternativ können zwei Workshops halber Größe parallel stattfinden. Die Workshops werden von international führenden Expertinnen und Experten der jeweiligen Fachgebiete organisiert. Teilnehmen kann nur, wer auf ihre Empfehlung hin vom Direktor persönlich eingeladen wurde. Das Ziel der Workshops ist es gleichermaßen die jüngsten Entwicklungen in einem bestimmten Fachgebiet zu diskutieren und daran anknüpfend neue Forschungsaktivitäten anzustoßen.

Miniworkshops. Ergänzend zu den großen Workshops können an festgelegten Wochen im Jahr jeweils bis zu drei einwöchige Miniworkshops mit jeweils 16-17 Teilnehmenden parallel veranstaltet werden. Das Programm richtet sich besonders an den wissenschaftlichen Nachwuchs. Da über die Themen erst ein halbes Jahr im Voraus entschieden wird, ist es möglich, auf aktuelle Entwicklungen schnell zu reagieren.

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. The committee 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 activities

The activities of the MFO are organized in three subdivisions: short-term research meetings, longer-term research stays and training. These subdivisions are specified in six central scientific programs: Workshops and Mini-Workshops, Oberwolfach Research Fellows and Oberwolfach Leibniz Fellows, as well as Oberwolfach Arbeitsgemeinschaft and Oberwolfach Seminars. Within these programs, there are special funding opportunities for early career researchers and established researchers.

Short-term research meetings

Workshops. 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. Participation is subject to a personal invitation by the Director after recommendation of the organizers. The aim of the Workshops is at the same time to discuss the latest developments in a specific subject area and, based on this, to initiate new research activities.

Mini-Workshops. In addition to the large Workshops, up to three one-week Mini-Workshops can be held in parallel on specific weeks of the year, each with 16-17 participants. The Mini-Workshops are aimed especially at early career researchers. Since the subjects are fixed only half a year before the Mini-Workshops take place, they allow to react to very recent developments.

Networking activities. Das Ziel dieser speziellen Kategorie von Workshops und Miniworkshops ist es, Chancengleichheit und Vielfalt noch stärker zu fördern und den Einfluss von Minderheiten in der Mathematik zu stärken. Zu diesem Zweck müssen Anträge für networking activities ein Konzept für ausgeprägte Vernetzungs- und Mentoringaktivitäten enthalten.

Tandem-Workshops. Die Idee der Tandem-Workshops ist es, dass zwei Gruppen zu je 16-24 Personen an zwei, üblicherweise weit entfernten Orten über Videokonferenz miteinander interagieren. Vor Ort können sich die Teilnehmenden auf die übliche intensive, direkte Weise austauschen. Zusätzlich können Vorträge mit der Tandem-Gruppe geteilt und gemeinsame Diskussionsrunden veranstaltet werden.

Längerfristige Forschungsaufenthalte

Oberwolfach Research Fellows (OWRF). Dieses Programm ermöglicht es Gruppen von 2-4 Forschenden für einen Zeitraum von 1-4 Wochen an einem vorher festzulegenden Projekt gemeinsam zu arbeiten. Projekte aus allen Gebieten der Mathematik können gefördert werden.

Oberwolfach Leibniz Fellows (OWLF). Nachwuchsforschende können sich zusätzlich für eine Oberwolfach Leibniz Fellowship bewerben. Dies ermöglicht ihnen eine Aufenthaltsdauer von bis zu 3 Monaten, als Einzelperson oder als Teil einer OWRF-Gruppe, sowie eine finanzielle Förderung bis zur Höhe eines Postdoc-Gehalts.

Fortbildungsveranstaltungen

Oberwolfach Arbeitsgemeinschaft. Die Idee der Arbeitsgemeinschaft ist es, sich unter Anleitung international anerkannter Spezialisten durch eigene Vorträge in ein neues, aktuelles Gebiet einzuarbeiten. Die Arbeitsgemeinschaft findet dreimal jährlich für jeweils eine Woche statt. Sie richtet sich sowohl an den wissenschaftlichen Nachwuchs als auch an etablierte Forscherinnen und Forscher. Das Thema einer Arbeitsgemeinschaft wird im Gespräch mit den Teilnehmenden der Arbeitsgemeinschaft des Vorjahres festgelegt. Die Themenplanung wird von Prof. Dr. Martin Hairer, Prof. Dr. Peter Scholze und Prof. Dr. Andreas Thom organisiert.

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 Promovierende

Networking activities. The aim of this special category of Workshops and Mini-Workshops is to further enhance equal opportunities and diversity and to strengthen the influence of minorities in mathematics. To this end, applications for networking activities must contain a detailed concept for networking and mentoring activities.

Tandem-Workshops. The idea of Tandem-Workshops is that two groups of 16-24 people in two, usually distant locations interact with each other via video conference. On site, participants can exchange ideas in the usual intensive, direct way. In addition, a number of lectures or discussion sessions can be shared with the tandem group.

Longer-term research stays

Oberwolfach Research Fellows (OWRF). The program enables groups of 2-4 researchers to work together on a previously defined project for a period of 1-4 weeks. Projects from all areas of mathematics can be supported.

Oberwolfach Leibniz Fellows (OLWF). Early career researchers may additionally apply for an Oberwolfach Leibniz Fellowship. This enables them to stay for up to 3 months, as an individual or as part of an OWRF group, as well as financial support up to the amount of a postdoctoral salary.

Training

Oberwolfach Arbeitsgemeinschaft. The idea of the Oberwolfach Arbeitsgemeinschaft (study group) is to learn about a new active topic by giving a lecture on it, guided by leading international specialists. The Arbeitsgemeinschaft meets three times per year for one week each time. It is aimed both at established and early career researchers. The topic of an Arbeitsgemeinschaft is chosen in discussion with participants of the previous meeting one year in advance. The schedule is led by Prof. Dr. Martin Hairer, Prof. Dr. Peter Scholze and Prof. Dr. Andreas Thom.

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

und Postdoktoranden aus aller Welt. Das Ziel ist es, 25 Teilnehmerinnen und Teilnehmer in ein besonders aktuelles Arbeitsgebiet einzuführen.

Wir freuen uns, dass die Carl Friedrich von Siemens Stiftung die Oberwolfach Seminare von Sommer 2008 bis 2022 substanziell unterstützt.

Banach Center – Oberwolfach Graduate Seminare. In Ergänzung zu den sechs jährlichen Oberwolfach Seminaren starteten im Jahr 2019 die „Banach Center – Oberwolfach Graduate Seminars". Sie werden in Zusammenarbeit mit dem Forschungsinstitut für Mathematik (Banach Center) der Polnischen Akademie der Wissenschaften (IMPAN) organisiert und finden im Konferenzzentrum Będlewo statt. Die Seminare richten sich an Promovierende und Postdoktoranden aus der ganzen Welt.

IMO Vorbereitungswoche. Das Institut beherbergt traditionell die abschließende Trainingswoche für besonders begabte Schülerinnen und Schüler zur Vorbereitung auf die Internationale Mathematik-Olympiade (IMO).

Finanzielle Fördermöglichkeiten

Simons Visiting Professors. Das Simons Visiting Professors (SVP) Programm wird durch die Simons Foundation finanziert. Das Programm unterstützt jährlich bis zu 40 führende Forscherinnen und Forscher von außerhalb Europas, die eine Teilnahme an einem Oberwolfacher Workshop mit einem Aufenthalt an einer europäischen Universität kombinieren möchten. Die Höhe der Förderung beträgt 135 € pro Tag des Gastaufenthalts an der Universität und wird für bis zu zwei Wochen gezahlt. Die beteiligten Universitäten stellen Unterkünfte für die Dauer des Besuchs an der Universität zur Verfügung und tragen die Reisekosten innerhalb Europas zwischen Oberwolfach und der Universität. Über die Förderung entscheidet der Direktor auf Vorschlag der Organisatorinnen und Organisatoren eines Workshops.

Oberwolfach Leibniz Graduate Students. Das MFO unterstützt die Teilnahme von im Durchschnitt fünf Oberwolfach Leibniz Graduate Students (OWLG) an den Oberwolfach Workshops. Gefördert werden exzellente Promovierende oder frisch Promovierte bis zu zwei Jahre nach der Promotion, insbesondere durch Reisekostenunterstützung. Es handelt sich um fünf zusätzliche Plätze pro Workshop, die für die OWLG reserviert sind und nicht durch etablierte Forscher besetzt werden dürfen.

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 2022.

Banach Center – Oberwolfach Graduate Seminars. In addition to the six annual Oberwolfach seminars, the "Banach Center – Oberwolfach Graduate Seminars" started in 2019. The seminars are organized in cooperation with the Institute of Mathematics (Banach Center) of the Polish Academy of Sciences (IMPAN) and take place at the conference center in Będlewo. They are aimed at doctoral candidates and postdocs from all around the world.

IMO training week. The Institute traditionally hosts the final training week for especially gifted pupils to prepare for the International Mathematical Olympiad (IMO).

Grants

Simons Visiting Professors. The Simons Visiting Professors (SVP) program is funded by the Simons Foundation. The program annually supports 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 of up to two weeks. The program provides support to each Simons Visiting Professor by Oberwolfach amounting to 135 € per day of the university visit. Additionally, the participating universities are 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. The SVP awards are decided by the Director on suggestion of the organizers of a Workshop.

Oberwolfach Leibniz Graduate Students. The MFO supports the participation of an average of five doctoral students per Oberwolfach Workshop. This program fosters excellent graduate students and recent postdocs (the Ph.D./Dr. degree must be received not more than two years ago), in particular by the reimbursement of travel costs. For this program, each Oberwolfach Workshop is given an extra capacity of five places which may not be taken by established researchers.

US Junior Oberwolfach Fellows. Das MFO fördert die Teilnahme von herausragenden Nachwuchsforscherinnen und -forschern US-amerikanischer Universitäten in allen einwöchigen Programmen des Instituts. Diese Förderung ist möglich dank der Unterstützung der amerikanischen National Science Foundation (NSF).

US Junior Oberwolfach Fellows. The MFO supports the participation of outstanding early career researchers from US universities in all weekly programs of the Institute. This is possible thanks to the support of the National Science Foundation (NSF).

Oberwolfach Foundation Fellows. Dieses Förderprogramm der Oberwolfach Stiftung erlaubt es dem MFO, eingeladene exzellente Nachwuchsforscherinnen- und forscher bei ihren Reisekosten zu unterstützen. Das MFO kann durchschnittlich einer Person pro Woche bis zu 1000 € der Reisekosten erstatten. Bewerben können sich alle eingeladenen Teilnehmerinnen und Teilnehmer, deren Promotion nicht länger als 10 Jahre zurückliegt, und die nachweislich von Orten mit unzureichender Unterstützung für den wissenschaftlichen Nachwuchs kommen.

Oberwolfach Foundation Fellows. This grant financed by the Oberwolfach Foundation enables the MFO to support invited excellent early career researchers with regard to their travel. It allows to reimburse travel expenses up to an amount of 1000 € for one early career researcher on average in every week. Invited participants coming from places with insufficient support for early career researchers to the MFO, with Dr./Ph.D. not longer than 10 years ago, can apply.

Publikationen

Das MFO veröffentlicht vier Publikationsreihen und unterstützt dabei die Idee von Open Access. Mit Ausnahme der Buchreihe „Oberwolfach Seminars" sind alle Veröffentlichungen elektronisch frei verfügbar.

Oberwolfach Reports. Um die Ergebnisse der Workshops einem international weiteren Kreis zugänglich zu machen wurde 2004 die Buchserie „Oberwolfach Reports" (OWR) gegründet. In Zusammenarbeit mit EMS Press erscheint sie jährlich mit vier Ausgaben von insgesamt mehr als 3.000 Seiten als Print- und Onlineversion. Die OWR beinhalten erweiterte Kurzfassungen aller Vorträge der Workshops, Miniworkshops und Arbeitsgemeinschaften im Umfang von jeweils ein bis drei Seiten.

Oberwolfach Seminars. Diese Buchreihe entsteht in Zusammenarbeit mit dem Birkhäuser Programm des Springer Verlags (Basel) und macht den Inhalt der Oberwolfach Seminare für ein größeres Publikum zugänglich.

Oberwolfach Preprints. In den Oberwolfach Preprints (OWP) werden hauptsächlich Resultate von längerfristigen Forschungsaufenthalten (OWRF und OWLF) publiziert.

Schnappschüsse moderner Mathematik. Die „Schnappschüsse moderner Mathematik aus Oberwolfach" richten sich an die mathematisch interessierte Öffentlichkeit und erklären mathematische Ideen und Probleme in verständlicher Art und Weise. Sie werden von Teilnehmenden des wissenschaftlichen Programms am MFO geschrieben. Ein Team aus Editorinnen und

Publications

The MFO has four distinct publication series and supports the idea of open access. Hence, all publications are freely available, with the exception of the book series "Oberwolfach Seminars".

Oberwolfach Reports. The Oberwolfach Reports (OWR) were initiated in 2004 to make the results of the workshops accessible to an even broader international audience. In collaboration with EMS Press they appear quarterly as print and online edition. The four issues comprise more than 3,000 pages per year. The OWR contain extended abstracts of all given talks of every Workshop, Mini-Workshop and Arbeitsgemeinschaft, with one to three pages per talk.

Oberwolfach Seminars. This is a book series in collaboration with the Birkhäuser program of Springer (Basel). In this series, the material of the Oberwolfach Seminars is made available to an even larger audience.

Oberwolfach Preprints. The Oberwolfach Preprints mainly contain research results related to a longer stay in Oberwolfach (OWRF and OWLF).

Snapshots of modern mathematics. The "snapshots of modern mathematics from Oberwolfach" address to everyone who is interested in mathematics and explain mathematical problems and ideas in an accessible and understandable way. They are written by participants of the scientific program at the MFO, who volunteer to explain an important aspect of their research. A

Editoren unterstützt sie bei der Aufbereitung der komplizierten Sachverhalte für ein breites Publikum.

team of editors assists them in communicating complicated matters to a broad audience.

Preise

Oberwolfach Preis. Der Oberwolfach Preis wird etwa alle drei Jahre von der Oberwolfach Stiftung in Kooperation mit dem MFO an exzellente Nachwuchsforscherinnen und -forscher verliehen. Der Preis ist für ausgezeichnete Errungenschaften in jeweils wechselnden Gebieten der Mathematik ausgelobt und mit 10.000 Euro dotiert. Die Auswahl aus den Nominierten trifft die Wissenschaftliche Kommission der Gesellschaft für Mathematische Forschung.

John Todd Award. Das MFO verleiht ebenfalls etwa alle drei Jahre zusammen mit der Oberwolfach Stiftung den John Todd Award für Nachwuchsforscherinnen und -forscher auf dem Gebiet der numerischen Analysis. Der John Todd Award ist mit 1.000 Euro dotiert.

Prizes

Oberwolfach Prize. The Oberwolfach Prize is awarded by the Oberwolfach Foundation in cooperation with the MFO to excellent early career researchers. The prize is awarded for excellent achievements in changing fields of mathematics. It amounts to 10,000 Euro. The selection from the nominees is made by the Scientific Committee of the Gesellschaft für Mathematische Forschung.

John Todd Award. The Oberwolfach Foundation awards in cooperation with the MFO approximately every three years the John Todd Award to early career scientists in numerical analysis. The John Todd Award amounts to 1,000 Euro.

Teilnahme am Leibniz MMS Netzwerk

Als Mitglied der Leibniz-Gemeinschaft nimmt das MFO am Netzwerk „Mathematical Modelling and Simulation" (MMS) teil. Das Thema spielt in vielen Aktivitäten des Instituts eine Rolle. Im Jahr 2022 fanden insgesamt 21 einwöchige Veranstaltungen statt, die verschiedene Aspekte dieses Forschungsfeldes aufgriffen.

Participation in the Leibniz MMS Network

As a member of the Leibniz Association, the MFO participates in the Leibniz network "Mathematical Modelling and Simulation" (MMS). The topic is present in many activities at Oberwolfach. In 2022 a total of 21 week-long events which covered various aspects of the MMS area of research took place.

2.2. Jahresprogramm 2022

Im Jahr 2022 wurden während 40 Wochen 43 Workshops durchgeführt, 11 Miniworkshops während 4 Wochen, 6 Seminare während 3 Wochen und 3 Arbeitsgemeinschaften während 3 Wochen.

Insgesamt nahmen ca. 2800 Forscherinnen und Forscher aus aller Welt an allen Programmen teil, davon ca. 22% aus Deutschland, 43% aus anderen europäischen Ländern und 36% aus dem nichteuropäischen Ausland. Der Großteil konnte wieder in Präsenz teilnehmen; der Anteil der Online-Teilnahmen ging auf ca. ein Viertel zurück.

Das Institut legt großen Wert darauf, dass alle Gebiete der Mathematik und ihre Grenzgebiete, auch im Hinblick auf Anwendungen, vertreten sind. Das nachfolgende Tagungsprogramm belegt diese Politik.

2.2. Annual schedule 2022

In the year 2022 43 Workshops have taken place during 40 weeks, as well as 11 Mini-Workshops during 4 weeks, 6 seminars during 3 weeks and 3 Arbeitsgemeinschaften during 3 weeks.

In total, more than 2800 researchers from all over the world attended the Oberwolfach research program, about 22% from Germany, 43% from other European countries, and 36% from non-European countries. The majority was able to participate in person again; the proportion of online participation fell to around a quarter.

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

ID	Date	Title
2201	02.01. - 08.01.2022	Graph Theory
2202	09.01. - 15.01.2022	Set Theory
2203	16.01. - 22.01.2022	Groups and Dynamics: Topology, Measure, and Borel Structure
2204	23.01. - 29.01.2022	Multiscale Coupled Models for Complex Media: From Analysis to Simulation in Geophysics and Medicine
2205	30.01. - 05.02.2022	Non-Archimedean Geometry and Applications
2206	06.02. - 12.02.2022	Space-Time Methods for Time-Dependent Partial Differential Equations
2208	20.02. - 26.02.2022	Data Assimilation – Mathematical Foundation and Applications
2209	27.02. - 05.03.2022	Geometric Structures in Group Theory
2210	06.03. - 12.03.2022	Population Dynamics and Statistical Physics in Synergy
2211a	13.03. - 19.03.2022	The Laguerre-Pólya Class and Combinatorics
2211b	13.03. - 19.03.2022	New Mathematical Techniques in Information Theory
2213	27.03. - 02.04.2022	Toric Geometry
2215a	10.04. - 16.04.2022	Structure-Preserving Discretizations for Nonlinear Systems of Hyperbolic, Involution-Constrained Partial Differential Equations on Manifolds
2215b	10.04. - 16.04.2022	Conic Linear Optimization for Computer-Assisted Proofs
2216	17.04. - 23.04.2022	Diophantische Approximationen
2217	24.04. - 30.04.2022	Combinatorics, Probability and Computing
2218	01.05. - 07.05.2022	Interactions between Algebraic Geometry and Noncommutative Algebra
2219	08.05. - 14 05.2022	Algebraic K-Theory
2220	15.05. - 21.05.2022	Re-thinking High-dimensional Mathematical Statistics
2221	22.05. - 28.05.2022	Deterministic Dynamics and Randomness in PDE
2222	29.05. - 04.06.2022	Universality: Random Matrices, Random Geometry and SPDEs
2224	12.06. - 18.06.2022	Geometrie
2225	19.06. - 25.06.2022	Hilbert Complexes: Analysis, Applications, and Discretizations
2226	26.06. - 02.07.2022	Nonlinear Waves and Dispersive Equations
2227	03.07. - 09.07.2022	Real Analysis, Harmonic Analysis and Applications
2228	10.07. - 16.07.2022	Algebraic Geometry: Moduli Spaces, Birational Geometry and Derived Aspects

2229	17.07. - 23.07.2022	The Renormalization Group
2230	24.07. - 30.07.2022	Topologie
2231	31.07. - 06.08.2022	Non-Commutative Geometry and Cyclic Homology
2232	07.08. - 13.08.2022	C*-Algebras
2233	14.08. - 20.08.2022	Calculus of Variations
2234	21.08. - 27.08.2022	Mathematical Imaging and Surface Processing
2235	28.08. - 03.09.2022	Character Theory and Categorification
2236	04.09. - 10.09.2022	Complex Geometry and Dynamical Systems
2237	11.09. - 17.09.2022	Large Scale Stochastic Dynamics
2238	18.09. - 24.09.2022	Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean
2239	25.09. - 01.10.2022	At the Interface between Semiclassical Analysis and Numerical Analysis of Wave Scattering Problems
2244	30.10. - 05.11.2022	Heat Kernels, Stochastic Processes and Functional Inequalities
2245	06.11. - 12.11.2022	Analytic Number Theory
2246	13.11. - 19.11.2022	Mathematical Advances in Geophysical Fluid Dynamics
2249a	04.12. - 10.12.2022	Algebraic Structures in Statistical Methodology
2249b	04.12. - 10.12.2022	History of Mathematics through Collaboration: Toward a Composite Portrait of Oswald Veblen
2250	11.12. - 17.12.2022	Enumerative Combinatorics

Miniworkshops

ID	Date	Title
2207a	13.02. - 19.02.2022	Interpolation, Approximation, and Algebra
2207b	13.02. - 19.02.2022	Descriptive Combinatorics, LOCAL Algorithms and Random Processes
2207c	13.02. - 19.02.2022	Regularization by Noise: Theoretical Foundations, Numerical Methods and Applications
2212a	20.03. - 26.03.2022	MFO-RIMS Tandem Workshop: Nonlocality in Analysis, Probability and Statistics
2212b	20.03. - 26.03.2022	Recent Developments in Representation Theory and Mathematical Physics
2240a	02.10. - 8.10.2022	Zero-Range and Point-Like Singular Perturbations: For a Spillover to Analysis, PDE and Differential Geometry

2240b	02.10. - 8.10.2022	Quantization of Complex Symplectic Varieties
2240c	02.10. - 8.10.2022	Mathematical Foundations of Robust and Generalizable Learning
2248a	27.11. - 03.12.2022	Topological and Differential Expansions of o-minimal Structures
2248b	27.11. - 03.12.2022	A Geometric Fairytale full of Spectral Gaps and Random Fruit
2248c	27.11. - 03.12.2022	Subvarieties in Projective Spaces and Their Projections

Oberwolfach Seminars

ID	Date	Title
2223a	05.06. - 11.06.2022	Taxis-Type Evolution Systems: Modeling and Analysis
2223b	05.06. - 11.06.2022	G-Complete Reducibility, Geometric Invariant Theory and Spherical Buildings
2243a	23.10. - 29.10.2022	Free Boundary Problems in Fluid Dynamics
2243b	23.10. - 29.10.2022	Stochastic Geophysical Fluid Dynamics
2247a	20.11. - 26.11.2022	Interfaces: Modeling, Analysis, Numerics
2247b	20.11. - 26.11.2022	Operator-Adapted Spaces in Harmonic Analysis and PDEs

Arbeitsgemeinschaften

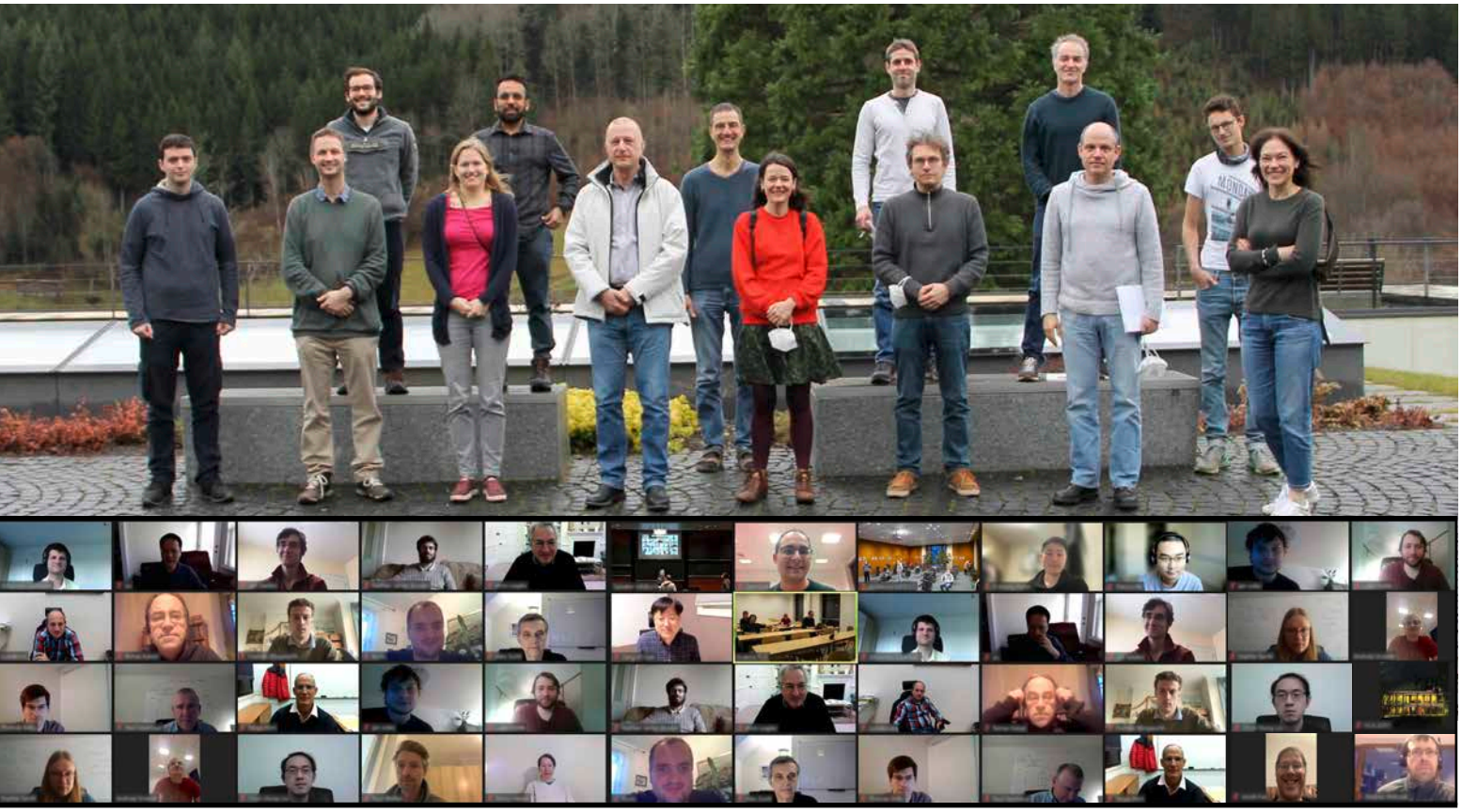
ID	Date	Title
2214	03.04. - 09.04.2022	Geometric Representation Theory
2241	09.10. - 14.10.2022	Higher Rank Teichmüller Theory
2242	16.10. - 22.10.2022	Quantitative Stochastic Homogenization

Fortbildungen/Training activities

ID	Date	Title
2221a	22.05. - 28.05.2022	Trainings- und Abschlussseminar für die Internationale Mathematik-Olympiade
2247c	20.11. - 25.11.2022	Banach Center – Oberwolfach Graduate Seminar: Geometry and Topology of Compact Homogeneous Spaces

2.3. Workshops

Workshop 2201



02.01. - 08.01.2022 **Graph Theory**
Organizers: Jim Geelen, Waterloo
Daniel Král, Brno
Alex Scott, Oxford

Abstract
Graph theory is a quickly developing area of mathematics, with an increasing number of connections to various parts of mathematics and computer science. The workshop aimed at bringing together a broad range of researchers at various career stages to discuss recent exciting developments, in particular, the Product Structure Theorem and progress towards the resolution of Hadwiger's Conjecture. While the workshop was impacted by the COVID pandemic, it still offered many interesting talks, which updated its participants on recent developments covering the whole breadth of graph theory, and collaboration opportunities.

Participants
Alon, Noga (Princeton), Bernshteyn, Anton (Atlanta), Bonamy, Marthe (Talence), Bowler, Nathan (Hamburg), Brettell, Nick (Wellington), Bucić, Matija (Zürich), Carmesin, Johannes (Birmingham), Chudnovsky, Maria (Princeton), Davies, James (Waterloo), Diestel, Reinhard (Hamburg), Dujmovic, Vida (Ottawa), Dvorak, Zdenek (Praha), Esperet, Louis (Grenoble), Fox, Jacob (Stanford), Geelen, James F. (Waterloo), Girao, Antonio (Heidelberg), Groenland, Carla (Utrecht), Grzesik, Andrzej (Kraków), Haxell, Penny E. (Waterloo), He, Xiaoyu (Stanford), Illingworth, Freddie (Oxford), Joret, Gwenaël (Bruxelles), Kaiser, Tomas (Plzen), Kawarabayashi, Ken-ichi (Tokyo), Kelly, Tom (Birmingham), Král, Daniel (Brno), Kreutzer, Stephan (Berlin), Kwon, O-joung (Incheon), Lamaison, Ander (Brno), Leader, Imre (Cambridge), Liu, Chun-Hung (College Station), McCarty, Rose (Waterloo), Micek, Piotr (Kraków), Mohar, Bojan (Burnaby), Mohr, Samuel (Brno), Morrison, Natasha (Victoria), Narayanan, Bhargav (New Brunswick), Nesetril, Jaroslav (Praha), Noel, Jonathan (Victoria), Norin, Sergey (Montréal), Oum, Sang-il (Daejeon), Pendavingh, Rudi (Eindhoven), Pilipczuk, Michal (Warszawa), Postle, Luke (Waterloo), Scott, Alex (Oxford), Sereni, Jean-Sébastien (Strasbourg), Seymour, Paul (Princeton), Spirkl, Sophie (Waterloo), Sudakov, Benjamin (Zürich), Thomassé, Stéphan (Lyon), Trotignon, Nicolas (Lyon), Volec, Jan (Praha), Vušković, Kristina (Leeds), Walczak, Bartosz (Kraków), Wei, Fan (Princeton), Wollan, Paul (Roma), Yepremyan, Liana (Atlanta), Yu, Xingxing (Atlanta)

09.01. - 15.01.2022 **Set Theory**

Organizers: Ilijas Farah, Toronto
Ralf Schindler, Münster
Dima Sinapova, Chicago
W. Hugh Woodin, Cambridge MA

Abstract

While set theory continues reaching out into various other fields of mathematics but also becomes more and more specialized, recent times have seen important results around holy grails of set theory which gave a new momentum to the whole field as a unit. After having had a meeting being cancelled in April 2020 due to Covid-19, we were very happy to now be able to realize a hybrid workshop with 17 participants being physically present. We explored topics in all areas of set theory.

Participants

Asperó, David (Norwich), Ben-Neria, Omer (Jerusalem), Brendle, Jörg (Kobe), Calderoni, Filippo (Chicago), Chan, William (Pittsburgh), Conley, Clinton T. (Pittsburgh), Cummings, James W. (Pittsburgh), Dobrinen, Natasha (Denver), Džamonja, Mirna (Paris), Farah, Ilijas (Toronto), Fischer, Vera (Wien), Foreman, Matthew D. (Irvine), Friedman, Sy-David (Wien), Gao, Su (Tianjin), Gitik, Moti (Ramat Aviv, Tel Aviv), Goldberg, Gabriel (Berkeley), Hamkins, Joel David (Oxford), Hayut, Yair (Jerusalem), Horowitz, Haim (Toronto), Jackson, Stephen C. (Denton), Kwiatkowska, Aleksandra (Münster), Larson, Paul B. (Oxford), Magidor, Menachem (Jerusalem), Marks, Andrew (Los Angeles), Mildenberger, Heike (Freiburg i. Br.), Moore, Justin Tatch (Ithaca), Poveda Ruzafa, Alejandro (Jerusalem), Rinot, Assaf (Ramat-Gan), Rosendal, Christian (Chicago), Sabok, Marcin (Montréal), Sakai, Hiroshi (Kobe), Sargsyan, Grigor (Sopot), Schindler, Ralf (Münster), Schlutzenberg, Farmer (Münster), Sinapova, Dima (Chicago), Solecki, Slawomir (Ithaca), Todorčević, Stevo (Toronto), Trang, Nam (Denton), Tsankov, Todor (Villeurbanne), Vaccaro, Andrea (Paris), Veličković, Boban D. (Paris), Viale, Matteo (Torino), Vignati, Alessandro (Paris), Wilson, Trevor M. (Oxford), Woodin, W. Hugh (Cambridge), Zapletal, Jindřich (Gainesville), Zeman, Martin (Irvine)

16.01. - 22.01.2022 **Groups and Dynamics: Topology, Measure, and Borel Structure**

Organizers: David Kerr, Münster
Anush Tserunyan, Montreal
Robin Tucker-Drob, Gainesville

Abstract
While the subjects of topological dynamics, ergodic theory, and descriptive set theory have long interacted in a variety of profitable ways, recent developments have ushered in a vigorous new phase of interplay between them, from the abstract transfer and coordinated development of ideas and methods (as in the theory of dynamical tilings) to the direct leveraging of technical points of contact (as in boundary theory). The workshop served as a platform for promoting and advancing these connections by bringing together researchers working on various facets of topological, measured, and Borel dynamics.

Participants
Abert, Miklos (Budapest), Aubrun, Nathalie (Orsay), Barbieri, Sebastián (Estación Central Santiago), Bartosova, Dana (Gainesville), Bernshteyn, Anton (Atlanta), Boutonnet, Rémi (Talence), Bowen, Matthew (Montréal), Calderoni, Filippo (Chicago), Caprace, Pierre-Emmanuel (Louvain-la-Neuve), Carderi, Alessandro (Karlsruhe), Chen, Ruiyuan (Montréal), Conley, Clinton T. (Pittsburgh), Cortez, Maria Isabel (Santiago), Duchesne, Bruno (Vandoeuvre-lès-Nancy), Foreman, Matthew D. (Irvine), Frisch, Joshua (Paris), Gaboriau, Damien (Lyon), Gardella, Eusebio (Göteborg), Geffen, Shirly (Leuven), Glasner, Eli (Ramat Aviv, Tel Aviv), Gutman, Yonatan (Warszawa), Houdayer, Cyril (Orsay), Jackson, Stephen C. (Denton), Joseph, Matthieu (Lyon), Kalantar, Mehrdad (Houston), Kechris, Alexander (Pasadena), Kennedy, Matthew (Waterloo), Kerr, David (Münster), Kida, Yoshikata (Tokyo), Kwiatkowska, Aleksandra (Münster), Le Maitre, Francois (Paris), Li, Hanfeng (Buffalo), Li, Xin (Glasgow), Lin, Yuqing (Frank) (College Station), Marks, Andrew (Los Angeles), Matte Bon, Nicolás (Villeurbanne), Medynets, Constantine (Annapolis), Melleray, Julien (Villeurbanne), Mellick, Samuel (Lyon), Naryshkin, Petr (Münster), Nekrashevych, Volodymyr V. (College Station), O'Quinn, James (Münster), Panagiotopoulos, Aristotelis (Münster), Pikhurko, Oleg (Coventry), Pogorzelski, Felix (Leipzig), Sabok, Marcin (Montréal), Shinko, Forte (Pasadena), Solecki, Slawomir (Ithaca), Strung, Karen (Praha), Szabó, Gábor (Leuven), Tamuz, Omer (Pasadena), Terlov, Grigory (Chicago), Thom, Andreas B. (Dresden), Thomas, Simon (Piscataway), Thornton, Riley (Los Angeles), Tsankov, Todor (Villeurbanne), Tserunyan, Anush (Montréal), Tucker-Drob, Robin (Gainesville), Weilacher, Felix (Pittsburgh), Wrobel, Konrad (St. Petersburg), Zheng, Tianyi (La Jolla), Zomback, Jenna (Urbana), Zucker, Andy (La Jolla)

23.01. - 29.01.2022

Multiscale Coupled Models for Complex Media: From Analysis to Simulation in Geophysics and Medicine

Organizers: Malgorzata Peszynska, Corvallis
Sorin Pop, Diepenbeek
Barbara Wohlmuth, Garching
Zohar Yosibash, Tel Aviv

Abstract

Many real-life applications require mathematical models at multiple scales, defined in domains with complex structures, some of which having time dependent boundaries. Mathematical models of this type are encountered in seemingly disparate areas. While the areas are different, the structure of the models and the challenges are shared: the analysis and simulation must account for the evolution of the domain due to the many coupled processes in the multi-scale context. The key theme and focus of the workshop were novel ideas in the mathematical modeling, analysis, and numerical simulation, which are cross-cutting between the two application areas mentioned above.

Participants

Ahlkrona, Josefin (Stockholm), Alhammali, Azhar (Dammam), Antonietti, Paola F. (Milano), Auricchio, Ferdinando (Pavia), Beddrich, Jonas (Garching bei München), Bociu, Lorena (Raleigh), Brenner, Susanne C. (Baton Rouge), Bringedal, Carina (Stuttgart), Bukač, Martina (Notre Dame), Canic, Suncica (Berkeley), Chung, Eric T. (Shatin, N.T., Hong Kong), Dawson, Clint (Austin), De Lorenzis, Laura (Zürich), Düster, Alexander (Hamburg), Duswald, Tobias (Genève), Gahn, Markus (Heidelberg), Gokieli, Maria (Warszawa), Golden, Kenneth M. (Salt Lake City), Guidoboni, Giovanna (Columbia), Gutierrez Lupinta, Gladys (Garching bei München), Hoang, Thi-Thao-Phuong (Auburn), Huyghe, Jacques (Limerick), Kumar, Kundan (Bergen), Layton, Anita (Waterloo), Le Tallec, Patrick (Palaiseau), Lunowa, Stephan Benjamin (Diepenbeek), Mitra, Koondanibha (Nijmegen), Nebulishvili, Natalia (Garching bei München), Neuss-Radu, Maria (Erlangen), Nordbotten, Jan Martin (Bergen), Peng, Alice (Leiden), Peszynska, Malgorzata (Corvallis), Pollock, Sara (Gainesville), Pop, Iuliu Sorin (Diepenbeek), Popp, Alexander (Neubiberg), Radu, Florin Adrian (Bergen), Rank, Ernst (München), Reali, Alessandro (Pavia), Rettinger, Christoph (Erlangen), Riviere, Beatrice (Houston), Rodrigo Cardiel, Carmen (Zaragoza), Roose, Tina (Southampton), Ruiz Baier, Ricardo (Clayton), Sacco, Riccardo (Milano), Sequeira, Adelia (Lisboa), Showalter, Ralph E. (Corvallis), Stockie, John (Burnaby), Storvik, Erlend (Bergen), Sun, Shuyu (Jeddah), Trucu, Dumitru (Dundee), van Brummelen, E. Harald (Eindhoven), Veneziani, Alessandro (Atlanta), Vermolen, Fred (Diepenbeek), Vohra, Naren (Corvallis), Wick, Thomas (Hannover), Wieners, Christian (Karlsruhe), Wohlmuth, Barbara (Garching bei München), Yosibash, Zohar (Ramat Aviv, Tel Aviv), Yotov, Ivan (Pittsburgh), Zhang, Yongjie Jessica (Pittsburgh

30.01. - 05.02.2022 **Non-Archimedean Geometry and Applications**

Organizers: Peter Schneider, Münster
Peter Scholze, Bonn
Michael Temkin, Jerusalem
Annette Werner, Frankfurt

Abstract

The workshop focused on recent developments in non-Archimedean analytic geometry with various applications to other fields. The topics of the talks included foundational results on analytic spaces as well as applications to the local Langlands conjecture, birational geometry, p-adic cohomology theories, Shimura varieties and the non-Archimedean Simpson correspondence. The workshop provideda lively platform to discuss new ideas with other experts.

Participants

Abramovich, Dan (Providence), Achinger, Piotr (Warszawa), André, Yves (Paris), Anschütz, Johannes (Bonn), Ardakov, Konstantin (Oxford), Berkovich, Vladimir (Rehovot), Bertapelle, Alessandra (Padova), Besser, Amnon (Beer-Sheva), Bhatt, Bhargav (Ann Arbor), Bode, Andreas (Calgary), Caraiani, Ana (London), Chan, Charlotte (Cambridge), Clausen, Dustin (København), Colmez, Pierre (Paris), de Shalit, Ehud (Jerusalem), Dospinescu, Gabriel (Lyon), Ducros, Antoine (Paris), Esnault, Hélène (Berlin), Faltings, Gerd (Bonn), Fargues, Laurent (Paris), Görtz, Ulrich (Essen), Groechenig, Michael (Toronto), Gubler, Walter (Regensburg), Hansen, David (Bonn), Hellmann, Eugen (Münster), Heuer, Ben (Bonn), Huber-Klawitter, Annette (Freiburg i. Br.), Hübner, Katharina (Heidelberg), Jonsson, Mattias (Ann Arbor), Le Bras, Arthur-César (Villetaneuse), Liu, Ruochuan (Beijing), Loeser, Francois (Paris), Mann, Lucas (Bonn), Mihara, Tomoki (Tsukuba-Shi), Mihatsch, Andreas (Bonn), Nicaise, Johannes (London), Niziol, Wieslawa (Paris), Poineau, Jérôme (Caen), Rapoport, Michael (Bonn), Schneider, Peter (Münster), Scholze, Peter (Bonn), Temkin, Michael (Jerusalem), Tyomkin, Ilya (Beer-Sheva), Wedhorn, Torsten (Darmstadt), Weinstein, Jared (Boston), Werner, Annette (Frankfurt am Main), Würthen, Matti (Frankfurt am Main), Xu, Chenyang (Princeton), Xu, Yujie (Cambridge), YU, Tony Yue (Orsay), Zavyalov, Bogdan (Bonn), Zhang, Mingjia (Bonn), Zhang, Shouwu (Princeton)

06.02. - 12.02.2022 **Space-Time Methods for Time-Dependent Partial Differential Equations**

Organizers: Stig Larsson, Göteborg
Ricardo Nochetto, College Park
Stefan Sauter, Zürich
Christian Wieners, Karlsruhe

Abstract
Modern discretization and solution methods for time-dependent PDEs consider the full problem in space and time simultaneously and aim to overcome limitations of classical approaches by first discretizing in space and then solving the resulting ODE, or first discretizing in time and then solving the PDE in space. The development of space-time methods for hyperbolic and parabolic differential equation is an emerging and rapidly growing field in numerical analysis and scientific computing. The focus of this workshop is on the optimal convergence of discretizations and on efficient error control for space-time methods for hyperbolic and parabolic problems, and on solution methods with optimal complexity. This is complemented by applications in the field of time-dependent stochastic PDEs, non-local material laws in space and time, optimization with time-dependent PDE constraints, and multiscale methods for time-dependent PDEs.

Participants
Ainsworth, Mark (Providence), Akrivis, Georgios (Ioannina), Antil, Harbir (Fairfax), Banjai, Lehel (Edinburgh), Bartels, Sören (Freiburg i. Br.), Bause, Markus (Hamburg), Behr, Marek (Aachen), Bonito, Andrea (College Station), Borthagaray, Juan Pablo (Montevideo), Bréhier, Charles-Edouard (Villeurbanne), Cangiani, Andrea (Trieste), Chernov, Alexey (Oldenburg), Corallo, Daniele (Karlsruhe), Demkowicz, Leszek F. (Austin), Dörfler, Willy (Karlsruhe), Du, Qiang (New York), Ern, Alexandre (Marne-la-Vallée), Falletta, Silvia (Torino), Florian, Francesco (Zürich), Gander, Martin (Genève), Gimperlein, Heiko (Innsbruck), Grote, Marcus (Basel), Hiptmair, Ralf (Zürich), Hochbruck, Marlis (Karlsruhe), Joly, Patrick (Palaiseau), Kachanovska, Maryna (Palaiseau), Krause, Rolf (Lugano), Lakkis, Omar (Brighton), Lang, Annika (Göteborg), Langer, Ulrich (Linz), Larson, Mats G. (Umeå), Larsson, Stig (Göteborg), Leykekhman, Dmitriy (Groton), Lubich, Christian (Tübingen), Lundholm, Carl (Umeå), Makridakis, Charalambos (Brighton), May, Sandra (Dortmund), Melenk, Jens M. (Wien), Monk, Peter (Newark), Nick, Jörg (Tübingen), Nochetto, Ricardo H. (College Park), Otárola, Enrique (Valparaiso), Reusken, Arnold (Aachen), Salgado, Abner J. (Knoxville), Sauter, Stefan A. (Zürich), Schanz, Martin (Graz), Schöberl, Joachim (Wien), Steinbach, Olaf (Graz), Stevenson, Rob P. (Amsterdam), Storn, Johannes (Bielefeld), van der Vegt, Jaap J.W. (Enschede), Vohralik, Martin (Paris), Wieners, Christian (Karlsruhe), Wihler, Thomas P. (Bern), Wohlmuth, Barbara (Garching bei München)

20.02. - 26.02.2022 **Data Assimilation – Mathematical Foundation and Applications**

Organizers: Youssef M. Marzouk, Cambridge MA
Sebastian Reich, Potsdam
Aretha Teckentrup, Edinburgh

Abstract
The field of "Data Assimilation" has been driven by applications from the geosciences where complex mathematical models are interfaced with observational data in order to improve model forecasts. Mathematically, data assimilation is closely related to filtering and smoothing on the one hand and inverse problems and statistical inference on the other. Key challenges of data assimilation arise from the high-dimensionality of the underlying models, combined with systematic spatio-temporal model errors, pure model uncertainty quantification and relatively sparse observation networks. Advances in the field of data assimilation will require combination of a broad range of mathematical techniques from differential equations, statistics, machine learning, probability, scientific computing and mathematical modeling, together with insights from practitioners in the field. The workshop brought together a collection of scientists representing this broad spectrum of research strands.

Participants
Baptista, Ricardo (Cambridge), Beeson, Ryne (Princeton), Bocquet, Marc (Marne-la-Vallée), Carrassi, Alberto (Reading), Chada, Neil (Thuwal), Crisan, Dan (London), Dashti, Masoumeh (Brighton), del Moral, Pierre (Talence), de Wiljes, Jana (Potsdam), Dubinkina, Svetlana (Amsterdam), Evensen, Geir (Bergen), Freitag, Melina (Potsdam), Gaudlitz, Sascha (Berlin), Ghattas, Omar (Austin), Hastermann, Gottfried (Potsdam), Iglesias, Marco (Nottingham), Jones, Christopher (Chapel Hill), Kantas, Nikolas (London), Klein, Rupert (Berlin), Künsch, Hans Rudolf (Zürich), Latz, Jonas (Edinburgh), Law, Kody J.H. (Manchester), Levine, Matthew E. (Pasadena), Marzouk, Youssef (Cambridge), Mehta, Prashant (Urbana), Morzfeld, Matthias (La Jolla), Nickl, Richard (Cambridge), Nüsken, Nikolas (Potsdam), Oliver, Dean S. (Bergen), Opper, Manfred (Berlin), Pathiraja, Sahani (Potsdam), Peherstorfer, Benjamin (New York), Pidstrigach, Jakiw P. (Potsdam), Potthast, Roland (Reading), Reich, Sebastian (Potsdam), Reiß, Markus (Berlin), Roininen, Lassi (Lappeenranta), Ruthotto, Lars (Atlanta), Sanz-Alonso, Daniel (Chicago), Schillings, Claudia (Mannheim), Schönlieb, Carola-Bibiane (Cambridge), Schwab, Christoph (Zürich), Stannat, Wilhelm (Berlin), Teckentrup, Aretha (Edinburgh), Titi, Edriss S. (Cambridge), Tong, Xin (Singapore), Wang, Sven (Cambridge), Zech, Jakob (Heidelberg), Zhang, Benjamin (Cambridge)

27.02. - 05.03.2022 **Geometric Structures in Group Theory**

Organizers: Martin Bridson, Oxford
Cornelia Drutu, Oxford
Linus Kramer, Münster
Bertrand Rémy, Palaiseau

Abstract

The conference was in the area of geometric group theory, the field of mathematics in which one studies infinite groups (finitely generated, or more generally locally compact, countable etc.) via actions on spaces endowed with various structures (geometric, measurable, analytic etc.). The surging current activity in the field is drawing more and more connections with other mathematical areas, and this was successfully reflected in the program of this week, during which problems in algebraic topology, representation theory and functional analysis, to name just a few, featured prominently alongside core topics in the area.

Participants

Arzhantseva, Goulnara N. (Wien), Bader, Uri (Rehovot), Bessmann, Lara (Münster), Breuillard, Emmanuel (Cambridge), Bridson, Martin R. (Oxford), Burger, Marc (Zürich), Caprace, Pierre-Emmanuel (Louvain-la-Neuve), de Laat, Tim (Münster), de la Salle, Mikael (Lyon), Drutu Badea, Cornelia (Oxford), Escalier, Amandine (Münster), Feighn, Mark E. (Newark), Fioravanti, Elia (Bonn), Fujiwara, Koji (Kyoto), Gaboriau, Damien (Lyon), Gardam, Giles (Münster), Grayevsky, Ido (Oxford), Guirardel, Vincent (Rennes), Hambleton, Ian (Hamilton), Hamenstädt, Ursula (Bonn), Horbez, Camille (Orsay), Hume, David (Oxford), Kedra, Jarek (Aberdeen), Kramer, Linus (Münster), Kropholler, Peter H. (Southampton), Kropholler, Robert (Coventry), Levitt, Gilbert (Caen), Llosa Isenrich, Claudio (Karlsruhe), Lopez Neumann, Antonio (Palaiseau), Lubotzky, Alex (Jerusalem), Mackay, John (Bristol), Michael, Anna (Magdeburg), Mozes, Shahar (Jerusalem), Nowak, Piotr (Warszawa), Osajda, Damian L. (Wrocław), Osin, Denis (Nashville), Przytycki, Piotr (Montréal), Reid, Alan W. (Houston), Rémy, Bertrand (Lyon), Sathaye, Bakul (Münster), Sauer, Roman (Karlsruhe), Schwer, Petra (Magdeburg), Sela, Zlil (Jerusalem), Shalom, Yehuda (Tel Aviv), Sisto, Alessandro (Edinburgh), Thomas, Anne (Sydney), Vigolo, Federico (Münster), Vogtmann, Karen L. (Coventry), Wade, Richard (Oxford), Wahl, Nathalie (København)

06.03. - 12.03.2022 **Population Dynamics and Statistical Physics in Synergy**

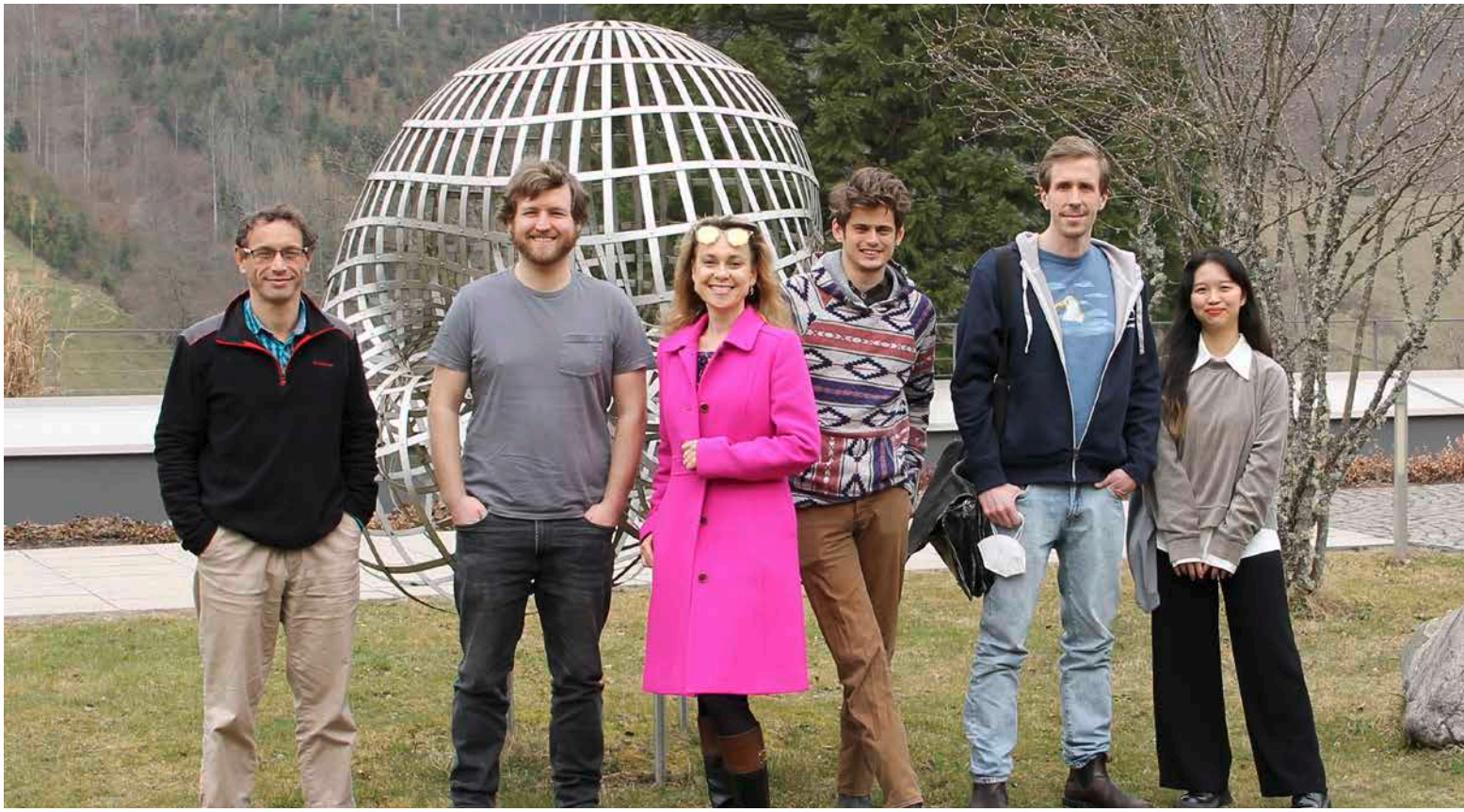
Organizers: Frank den Hollander, Leiden
Anja Sturm, Göttingen
Anita Winter, Essen

Abstract

Research at the interface between population dynamics and statistical physics has been developing rapidly, and represents a theme of growing interest worldwide. Population dynamics addresses fundamental questions about the cooperative behaviour controlling multi-type interacting populations subject to evolutionary forces in changing environments. Statistical physics is concerned with the macroscopic behaviour of systems with many interacting components, and with the role of emergent behaviour and phase transitions. Fundamental ideas, methods and techniques have gradually made their way from one field into the other, leading to new problems, new solutions, and new mathematics. This crossroad has developed into a very active research area. In the workshop the focus was on common mathematical concepts and tools, and on the surprising new connections that have become available recently.

Participants

Angtuncio Hernández, Osvaldo (Essen), Athreya, Siva (Bangalore, Bengaluru), Baake, Ellen (Bielefeld), Berestycki, Julien (Oxford), Birkner, Matthias (Mainz), Blancas, Airam (Ciudad de México), Blath, Jochen (Berlin), Boenkost, Florin (Wien), Bösze, Zsuzsanna (Göttingen), Brunet, Éric (Paris), Cardona Tobon, Natalia (Göttingen), Carinci, Gioia (Modena), Champagnat, Nicolas (Vandoeuvre-lès-Nancy), Cordero, Fernando (Bielefeld), den Hollander, Frank (Leiden), Depperschmidt, Andrej (Hamburg), Etheridge, Alison M. (Oxford), Evans, Steven N. (Berkeley), Floreani, Simone (Delft), Franchescini, Chiara (Modena), Freeman, Nic (Sheffield), Gantert, Nina (Garching bei München), Giardina, Cristian (Modena), Greven, Andreas (Erlangen), Hummel, Sebastian (Berkeley), Jansen, Sabine (München), Kliem, Sandra (Leipzig), Klimovsky, Anton (Essen), Kraaij, Richard (Delft), Krug, Joachim (Köln), Kurt, Noemi (Berlin), Lambert, Amaury (Paris), Limic, Vlada (Strasbourg), Mailler, Cécile (Bath), Meleard, Sylvie (Palaiseau), Möhle, Martin (Tübingen), Nagy, Oliver (Leiden), Nandan, Shubhamoy (Leiden), Nussbaumer, Josué (Champs-sur-Marne), Ortgiese, Marcel (Bath), Pfaffelhuber, Peter (Freiburg i. Br.), Pokalyuk, Cornelia (Frankfurt am Main), Popovic, Lea (Montréal), Redig, Frank (Delft), Röllin, Adrian (Singapore), Schertzer, Emmanuel (Paris), Schweinsberg, Jason (La Jolla), Seiler, Marco (Göttingen), Sturm, Anja (Göttingen), Sun, Rongfeng (Singapore), Swart, Jan M. (Praha), Tran, Viet Chi (Champs-sur-Marne), Veber, Amandine (Paris), Wakolbinger, Anton (Frankfurt am Main), Wilke Berenguer, Maite (Berlin), Winter, Anita (Essen)



13.03. - 19.03.2022 **The Laguerre-Pólya Class and Combinatorics**

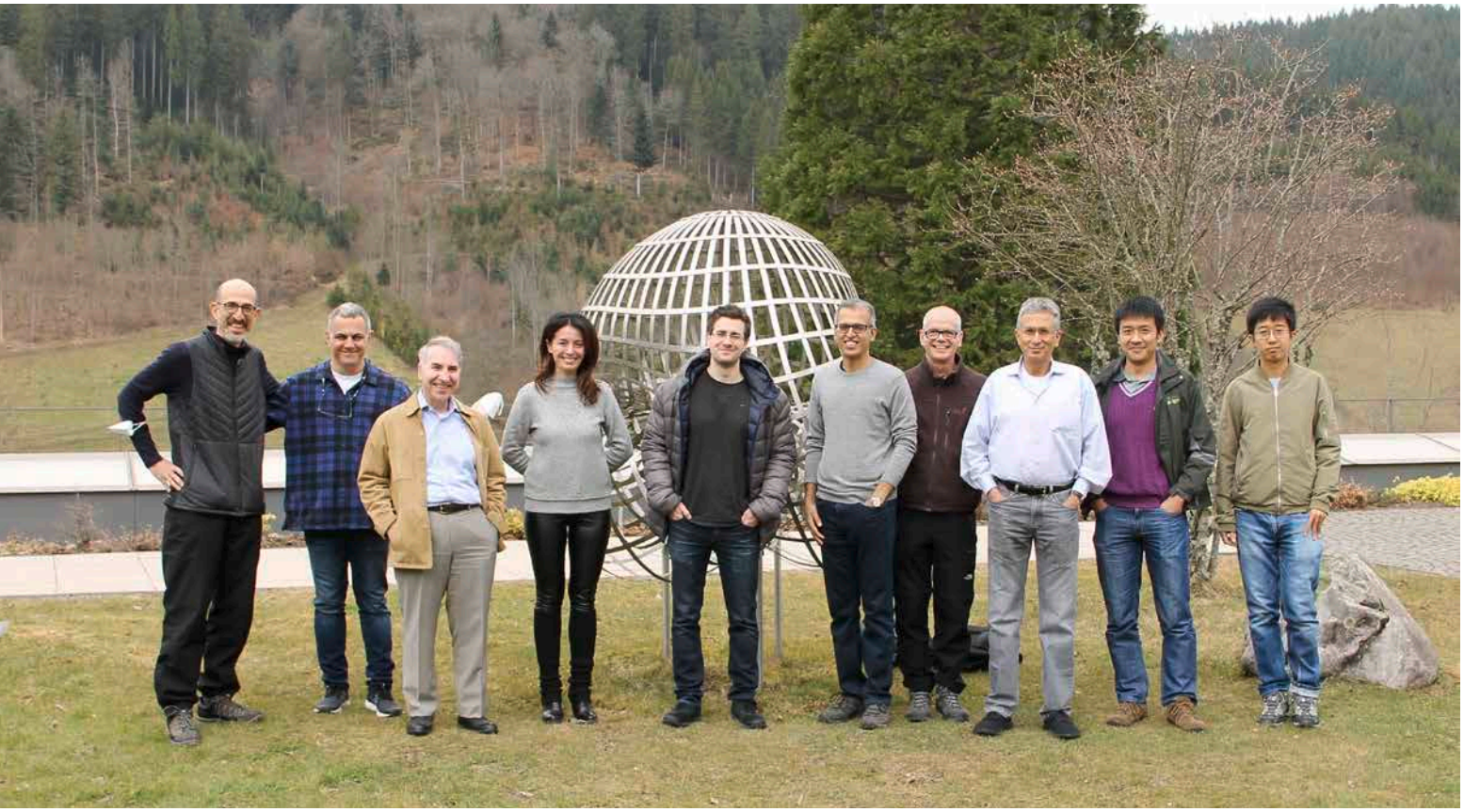
Organizers: Kathy Driver, Cape Town
Olga Holtz, Berkeley
Alan Sokal, London

Abstract

The talks at the workshop were focused on zero localization and zero finding of entire functions, with applications to analytic number theory and combinatorics. The discussions included specific areas such as stable and hyperbolic polynomials, the Laguerre-Pólya class of entire functions, Pólya frequency sequences, total positivity for sequences and functions, and zeros of generating functions arising in probability and combinatorics.

Participants

Brändén, Petter (Stockholm), Chen, Xi (Dalian, Liaoning Province), Dimitrov, Dimitar (São José do Rio Preto), Driver, Kathleen (Rondebosch), Dyachenko, Alexander (Moscow), Eremenko, Alex E. (West Lafayette), Holtz, Olga (Berkeley), Karp, Dmitry (Holon), Katkova, Olga (Boston), Khare, Apoorva (Bangalore, Bengaluru), Khrushchev, Sergei (Almaty), Ki, Haseo (Seoul), Kostov, Vladimir (Nice), Leake, Jonathan (Berlin), Liu, Lily Li (Qufu), Martinez-Finkelshtein, Andrei (Waco), Nguyen, Thu Hien (Kharkiv), Pascoe, James Eldred (Gainesville), Sokal, Alan D. (London), Srivastava, Nikhil (Berkeley), Tyaglov, Mikhail (Moscow), Vinzant, Cynthia (Seattle), Vishnyakova, Anna (Kharkiv), Wang, Yi (Dalian, Liaoning Province), Zhu, Bao-Xuan (Xuzhou)



13.03. - 19.03.2022 **New Mathematical Techniques in Information Theory**

Organizers: Amos Lapidoth, Zürich
Prakash Narayan, College Park

Abstract

Information theory is the richer for a surge of recent advances in relevant mathematical techniques. The workshop fostered an exchange of ideas on new mathematical tools which are typically outside the classical toolbox of information theorists and that are yet useful in solving classical and modern problems in information theory and related areas. The focus was on mathematical techniques that are of a general nature and that could benefit a wide class of problems. A number of broad mathematical areas were identified that held promise with established early successes, and key contributors were invited to make presentations and initiate discussions with an emphasis on emergent topics. The areas were: information measures, measure concentration, hypercontractivity and correlation measures, Shannon theory and extremal combinatorics, advanced tools for proving converse results in coding theorems, and recent techniques for proving Gaussian optimality entailing new characterizations of Gaussian distributions.

Participants

Bhattacharya, Sagnik (College Park), Boche, Holger (München), Courtade, Thomas (Berkeley), Girardin, Valérie (Caen), Gohari, Amin (Tehran), Graczyk, Robert (Zürich), Guillen i Fabregas, Albert (Cambridge), Kontoyiannis, Ioannis (Cambridge), Lapidoth, Amos (Zürich), Li, Cheuk Ting (Shatin, N.T., Hong Kong), Liu, Jingbo (Champaign), Madiman, Mokshay (Newark), Nageswaran, Ajay (College Park), Nair, Chandra (Shatin, N.T., Hong Kong), Narayan, Prakash (College Park), Ni, Baohua (Zürich), Polyanskiy, Yury (Cambridge), Sason, Igal (Haifa), Somekh-Baruch, Anelia (Ramat-Gan), Steinberg, Yossef (Haifa), Tchamkerten, Aslan (Paris), Telatar, Emre (Lausanne), Tulino, Antonia (Napoli), Tyagi, Himanshu (Bangalore, Bengaluru), Venkataramanan, Ramji (Cambridge), Wang, Lele (Vancouver), Wang, Ligong (Cergy-Pontoise), Watanabe, Shun (Tokyo), Wigger, Michèle (Palaiseau), Wu, Yihong (New Haven), Yan, Yiming (Zürich)

27.03. - 02.04.2022 **Toric Geometry**

Organizers: Jürgen Hausen, Tübingen
Milena Hering, Edinburgh
Nathan Ilten, Burnaby
Diane Maclagan, Coventry

Abstract

Toric geometry is a vibrant subfield of algebraic geometry that draws on strong connections to combinatorics. The 2022 workshop brought together a broad group of mathematicians both in-person and virtually to discuss aspects of the field, ranging from K-stability to machine learning. In-person participants were happy to meet again for intense mathematical discussions after the pandemic pause, and many informal connections were created. We are grateful to Oberwolfach for hosting this workshop, and providing such excellent working conditions.

Participants

Abramovich, Dan (Providence), Altmann, Klaus (Berlin), Araujo, Carolina (Rio de Janeiro), Baeuerle, Andreas (Tübingen), Batyrev, Victor V. (Tübingen), Berkesch, Christine (Minneapolis), Blum, Harold (Salt Lake City), Brandenburg, Marie-Charlotte (Leipzig), Brion, Michel (Gières), Bruce, Juliette (Berkeley), Buczynski, Jaroslaw (Warszawa), Casagrande, Cinzia (Torino), Castravet, Ana-Maria (Versailles), Clarke, Oliver (Bristol), Corti, Alessio (London), Dickenstein, Alicia (Buenos Aires), Di Rocco, Sandra (Stockholm), Filip, Matej (Ljubljana), Giesler, Julius (Tübingen), Haase, Christian (Berlin), Harada, Megumi (Hamilton), Hausen, Jürgen (Tübingen), Hering, Milena (Edinburgh), Hofscheier, Johannes (Nottingham), Ilten, Nathan (Burnaby), Jelisiejew, Joachim (Warszawa), Kalashnikov, Elana (Waterloo), Karu, Kalle (Vancouver), Kasprzyk, Alexander M. (Nottingham), Kaveh, Kiumars (Pittsburgh), Laface, Antonio (Concepción), Legendre, Eveline (Toulouse), Maclagan, Diane (Coventry), Manon, Christopher (Lexington), Mohammadi, Fatemeh (Gent), Monin, Leonid (Leipzig), Nill, Benjamin (Magdeburg), Ottem, John Christian (Oslo), Payne, Sam (Austin), Petracci, Andrea (Bologna), Postinghel, Elisa (Povo), Romano, Eleonora (Genova), Salat Moltó, Martí (Barcelona), Satriano, Matthew (Waterloo), Schenck, Henry K. (Auburn), Smith, Gregory G. (Kingston), Sottile, Frank (College Station), Sturmfels, Bernd (Leipzig), Süß, Hendrik (Jena), Teissier, Bernard (Paris), Temkin, Michael (Jerusalem), Tevelev, Jenia (Amherst), Wisniewski, Jaroslaw (Warszawa), Wlodarczyk, Jaroslaw (West Lafayette), Wrobel, Milena (Oldenburg)

10.04. - 16.04.2022

Structure-Preserving Discretizations for Nonlinear Systems of Hyperbolic, Involution-Constrained Partial Differential Equations on Manifolds

Organizers: Manuel Castro, Malaga
Bruno Després, Paris
Michael Dumbser, Trento
Christian Klingenberg, Würzburg

Abstract
The topic of this workshop was the study of mathematical and numerical analysis for involution-constrained hyperbolic partial differential equations on manifolds. An example is the positivity of the density for the compressible Euler equations. 25 international participants attended the workshop. There were 22 lectures, covering a wide gamut of the topic.

Participants
Barsukow, Wasilij (Garching bei München), Birke, Claudius (Würzburg), Brenier, Yann (Paris), Busto, Saray (Vigo), Castro Diaz, Manuel J. (Malaga), Chandrashekarappa, Praveen (Bangalore, Bengaluru), Crouseilles, Nicolas (Rennes), Despres, Bruno (Paris), Dubois, Francois (Orsay), Dumbser, Michael (Trento), Gaburro, Elena (Talence), Gassner, Gregor (Köln), Gavrilyuk, Sergey L. (Marseille), Guermond, Jean-Luc (College Station), Helluy, Philippe (Strasbourg), Klingenberg, Christian (Würzburg), LeFloch, Philippe G. (Paris), Munz, Claus-Dieter (Stuttgart), Pavelka, Michal (Praha), Peshkov, Ilya (Trento), Puppo, Gabriella A. (Roma), Re, Barbara (Milano), Romenskiy, Evgeniy (Novosibirsk), Shashkov, Mikhail (Los Alamos), Sonnendrücker, Eric (Garching bei München)

10.04. - 16.04.2022 **Conic Linear Optimization for Computer-Assisted Proofs**

Organizers: Etienne de Klerk, Tilburg
Didier Henrion, Toulouse/Prague
Frank Vallentin, Cologne
Angelika Wiegele, Klagenfurt

Abstract

From a mathematical perspective, optimization is the science of proving inequalities. In this sense, computational optimization is a method for computer-assisted proofs. Conic (linear) optimization is the problem of minimizing a linear functional over the intersection of a convex cone with an affine subspace of a topological vector space. For many cones this problem is computationally tractable, and as a result there is a growing number of computer-assisted proofs using conic optimization in discrete geometry, (extremal) graph theory, numerical analysis, and other fields, the most famous example perhaps being the proof of the Kepler Conjecture. The aim of this workshop was to bring researchers from these diverse fields together to work towards expanding the current scope of conic optimization as a method of generating proofs, and to identify problems and challenges to work on together.

Participants

Brosch, Daniel (Tilburg), Dannenberg, Valentin (Rostock), de Klerk, Etienne (Tilburg), de Laat, David (Delft), de Oliveira Filho, Fernando Mario (Delft), Dostert, Maria (Stockholm), Gaar, Elisabeth (Linz), Golubev, Konstantin (Zürich), Hall, Georgina (Fontainebleau), Henrion, Didier (Toulouse), Kirschner, Felix (Tilburg), Korda, Milan (Toulouse), Laurent, Monique (Amsterdam), Magron, Victor (Toulouse), Miller, Jared (Boston), Moustrou, Philippe (Toulouse), Naldi, Simone (Limoges), Pasechnik, Dmitrii V. (Oxford), Safey El Din, Mohab (Paris), Siebenhofer, Melanie (Klagenfurt), Sotirov, Renata (Tilburg), Spomer, Andreas (Köln), Taylor, Adrien (Paris), Vallentin, Frank (Köln), Wiegele, Angelika (Klagenfurt)

17.04. - 23.04.2022 **Diophantische Approximationen**

Organizers: Yann Bugeaud, Strasbourg
Pietro Corvaja, Udine
Laura DeMarco, Cambridge MA
Philipp Habegger, Basel

Abstract

This workshop was focused on a large variety of problems which have seen important progress during the last few years, such as extensions and refinements of Schmidt Subspace Theorem, together with new applications, works on the Zilber-Pink conjecture and on unlikely intersections, geometry of numbers, simultaneous Diophantine approximation, theory of heights, continued fractions, and arithmetic dynamics.

Participants

Adamczewski, Boris (Villeurbanne), Akhtari, Shabnam (Eugene), Allen, Demi (Exeter), Amoroso, Francesco (Caen), Baake, Michael (Bielefeld), Badziahin, Dzmitry (Sydney), Barroero, Fabrizio (Roma), Bell, Jason P. (Waterloo), Bennett, Michael A. (Vancouver), Beresnevich, Victor (Heslington, York), Bilu, Yuri (Talence), Breuillard, Emmanuel (Cambridge), Bugeaud, Yann (Strasbourg), Capuano, Laura (Roma), Checcoli, Sara (Grenoble), Cheung, Yitwah (Beijing), Coons, Michael (Bielefeld), Corvaja, Pietro (Udine), Daw, Christopher M. (Reading), DeMarco, Laura (Cambridge), Demeio, Julian (Bonn), Dill, Gabriel A. (Hannover), Dimitrov, Vesselin (Toronto), Evertse, Jan-Hendrik (Leiden), Fuchs, Clemens (Salzburg), Gao, Ziyang (Hannover), Gaudron, Eric (Aubière), Ghosh, Anish (Mumbai), Habegger, Philipp (Basel), Hirata-Kohno, Noriko (Tokyo), Ingram, Patrick (Toronto), Krieger, Holly (Cambridge), Kühne, Lars (København), Levin, Aaron D. (East Lansing), Looper, Nicole (Providence), Masser, David (Basel), Mavraki, Niki Myrto (Cambridge), Mello, Jorge (Bonn), Moshchevitin, Nikolay G. (Moscow), Nguyen, Dang-Khoa (Calgary), Orr, Martin (Manchester), Ostafe, Alina (Sydney), Pazuki, Fabien (København), Philippon, Patrice (Paris), Poels, Anthony (Tokyo), Pottmeyer, Lukas (Essen), Rivoal, Tanguy (Grenoble), Roy, Damien (Ottawa), Sprang, Johannes (Essen), Stewart, Cameron L. (Waterloo), Velani, Sanju (Heslington, York), Viada, Evelina (Göttingen), Viola, Carlo (Pisa), Waldschmidt, Michel (Limours), Widmer, Martin (Egham), Wilms, Robert (Basel), Xie, Junyi (Beijing), Zannier, Umberto (Pisa), Zudilin, Wadim (Nijmegen)

24.04. - 30.04.2022 **Combinatorics, Probability and Computing**

Organizers: Michael Krivelevich, Tel Aviv
Robert Morris, Rio de Janeiro
Oliver Riordan, Oxford
Angelika Steger, Zürich

Abstract

The main theme of this workshop was the use of probabilistic methods in combinatorics and theoretical computer science. This area is evolving extremely quickly, with the introduction of powerful new methods and the development of increasingly sophisticated techniques, and there have been a number of very significant breakthroughs in the area in recent years. The workshop emphasized several of these recent breakthroughs, which include applications of probabilistic techniques to extremal questions, and of combinatorial techniques to areas of discrete probability theory, such as random matrices and planar percolation.

Participants

Allen, Peter (London), Alon, Noga (Princeton), Alweiss, Ryan (Princeton), Balister, Paul (Oxford), Balogh, József (Urbana), Böttcher, Julia (London), Bucić, Matija (Princeton), Campos, Marcelo (Rio de Janeiro), Coja-Oghlan, Amin (Dortmund), Conlon, David (Pasadena), Gamarnik, David (Cambridge), Gishboliner, Lior (Zürich), Haxell, Penny E. (Waterloo), Heckel, Annika (Uppsala), Janson, Svante (Uppsala), Jenssen, Matthew (Birmingham), Kahn, Jeff (Piscataway), Kang, Mihyun (Graz), Keevash, Peter (Oxford), Krivelevich, Michael (Ramat Aviv, Tel Aviv), Kronenberg, Gal (Oxford), Kwan, Matthew (Klosterneuburg), Letzter, Shoham (London), Liebenau, Anita (Sydney), Linial, Nathan (Jerusalem), Long, Eoin Patrick (Birmingham), Lubetzky, Eyal (New York), Łuczak, Tomasz (Poznań), Mattos, Leticia (Berlin), Montgomery, Richard (Coventry), Morris, Patrick (Barcelona), Morris, Robert (Rio de Janeiro), Morrison, Natasha (Victoria), Mubayi, Dhruv (Chicago), Narayanan, Bhargav (New Brunswick), Panagiotou, Konstantinos (München), Park, Jinyoung (Stanford), Perkins, Will (Chicago), Pham, Huy Tuan (Stanford), Pokrovskiy, Alexey (London), Riordan, Oliver (Oxford), Rucinski, Andrzej (Poznań), Sah, Ashwin (Cambridge), Sahasrabudhe, Julian (Cambridge), Samotij, Wojciech (Ramat Aviv, Tel Aviv), Sarikaya, Deniz (Brussels), Sauermann, Lisa (Cambridge), Sawhney, Mehtaab (Cambridge), Schacht, Mathias (Hamburg), Scott, Alex (Oxford), Shapira, Asaf (Ramat Aviv, Tel Aviv), Staden, Katherine (Milton Keynes), Steger, Angelika (Zürich), Sudakov, Benjamin (Zürich), Szabó, Tibor (Berlin), Tassion, Vincent (Zürich), Warnke, Lutz P. (La Jolla), Wormald, Nicholas (Clayton), Yepremyan, Liana (Atlanta), Zhao, Yufei (Cambridge)

01.05. - 07.05.2022 **Interactions between Algebraic Geometry and Noncommutative Algebra**

Organizers: Bill Crawley-Boevey, Bielefeld
Markus Reineke, Bochum
Catharina Stroppel, Bonn
Michel Van den Bergh, Diepenbeek

Abstract
This workshop was on the interactions between noncommutative algebra, representation theory and algebraic geometry. The major objective was to bring together researchers from those areas with the focus on topics and problems where geometric methods are prevalent. The mathematical spectrum was rather broad ranging from classical ring theory, over derived noncommutative geometry, algebraic geometry and higher Auslander-Reiten theory to geometric representation theory. Derived categories and Hall algebras of different types were some of the main linking themes.

Participants
August, Jenny (Aarhus), Bell, Jason P. (Waterloo), Bellamy, Gwyn (Glasgow), Belmans, Pieter (Esch-sur-Alzette), Bennett-Tennenhaus, Raphael (Bielefeld), Berest, Yuri (Ithaca), Bezrukavnikov, Roman (Cambridge), Bocklandt, Rafael (Amsterdam), Bonfert, Lukas (Bonn), Boos, Magdalena (Bochum), Brown, Ken A. (Glasgow), Chan, Daniel (Sydney), Crawley-Boevey, William (Bielefeld), Davison, Ben D. J. (Edinburgh), Donovan, Will (Beijing), Eberhardt, Jens (Wuppertal), Faber, Eleonore (Leeds), Franzen, Hans (Bochum), Ginzburg, Victor (Chicago), Goodearl, Kenneth R. (Santa Barbara), Gordon, Iain (Edinburgh), Huisgen-Zimmermann, Birge (Santa Barbara), Ingalls, Colin (Ottawa), Iyama, Osamu (Tokyo), Kaledin, Dmitry (Moscow), Kaplan, Daniel (Diepenbeek), Kapranov, Mikhail (Kashiwa), Keller, Bernhard (Paris), Kirkman, Ellen E. (Winston-Salem), Lekili, Yanki (London), Lowen, Wendy (Antwerpen), Lunts, Valery A. (Bloomington), Martinez Acosta, Karen Lizeth (Bochum), Nehme, Jonas (Bonn), Nordskova, Anya (Hasselt), Okawa, Shinnosuke (Osaka), Orlov, Dmitri (Moscow), Przezdziecki, Tomasz (Edinburgh), Reineke, Markus (Bochum), Rizzardo, Alice (Liverpool), Sala, Francesco (Pisa), Sauter, Julia (Bielefeld), Schedler, Travis (London), Scherotzke, Sarah (Belvaux), Schiffmann, Olivier (Orsay), Sembowski, David (Bochum), Sierra, Susan J. (Edinburgh), Smith, S. Paul (Seattle), Smoktunowicz, Agata (Edinburgh), Soibelman, Yan (Manhattan), Spenko, Spela (Bruxelles), Stafford, J. Toby (Manchester), Stroppel, Catharina (Bonn), Van den Bergh, Michel (Hasselt), Wemyss, Michael (Glasgow), Wu, Quan-Shui (Shanghai Shi), Yekutieli, Amnon (Beer-Sheva), Young, Matthew (Logan), Zhang, James (Seattle)

08.05. - 14.05.2022 **Algebraic K-Theory**

Organizers: Thomas Geisser, Tokyo
Lars Hesselholt, Copenhagen
Annette Huber-Klawitter, Freiburg
Moritz Kerz, Regensburg

Abstract

Algebraic K-theory has seen further progress during the last three years. One important aspect of this recent progress has been a better conceptual understanding of motivic filtrations on K-theory and the systematic use of localizing invariants and related concepts. Progress on motivic cohomology has also played an important role concerning foundations as well as applications. The workshop was well attended by over fifty participants from various backgrounds.

Participants

Annala, Toni Mikael (Aalto), Antieau, Benjamin (Evanston), Aoki, Ko (Bonn), Asok, Aravind (Los Angeles), Bachmann, Tom (München), Binda, Federico (Milano), Bräunling, Oliver (Freiburg i. Br.), Cisinski, Denis-Charles (Regensburg), Cortinas, Guillermo (Buenos Aires), Elmanto, Elden (Cambridge), Esnault, Hélène (Berlin), Geisser, Thomas H. (Tokyo), Gerhardt, Teena (East Lansing), Haesemeyer, Christian (Parkville), Hesselholt, Lars (København), Hornbostel, Jens (Wuppertal), Hoyois, Marc (Regensburg), Huber-Klawitter, Annette (Freiburg i. Br.), Iwasa, Ryomei (København), Jansen, Mikala (København), Kahn, Bruno (Paris), Kai, Wataru (Sendai), Kelly, Shane (Tokyo), Kerz, Moritz (Regensburg), Krause, Achim (Münster), Land, Markus (München), Levine, Marc (Essen), Morin, Adrien (Talence), Morin, Baptiste (Talence), Morrow, Matthew (Paris), Nikolaus, Thomas (Münster), Østvær, Paul Arne (Milano), Park, Jinhyun (Daejeon), Pirutka, Alena (New York), Ramachandran, Niranjan (College Park), Ravi, Charanya (Bonn), Ren, Fei (Wuppertal), Röndigs, Oliver (Osnabrück), Rülling, Kay (Wuppertal), Saito, Shuji (Tokyo), Schmidt, Alexander (Heidelberg), Scholbach, Jakob (Padova), Sosnilo, Vladimir (St. Petersburg), Spitzweck, Markus (Osnabrück), Szamuely, Tamás (Pisa), Tamme, Georg (Mainz), Terenzi, Luca (Freiburg i. Br.), Wang, Guozhen (Shanghai Shi), Weibel, Charles A. (New Brunswick), Wendt, Matthias (Wuppertal), Wickelgren, Kirsten G. (Durham), Yakerson, Maria (Zürich), Yamazaki, Takao (Sendai), Zakharevich, Inna (Ithaca)

15.05. - 21.05.2022 **Re-thinking High-dimensional Mathematical Statistics**

Organizers: Florentina Bunea, Ithaca
Robert Nowak, Madison
Alexandre Tsybakov, Palaiseau

Abstract

The mathematical treatment of high dimensional statistical problems has been at the core of recent research in Statistics, Machine Learning and Artificial Intelligence. The workshop highlighted recent theoretical advances on inference in high-dimensional statistical models based on the interplay of techniques from mathematical statistics, machine learning, theoretical computer science and related areas. The workshop brought together about 50 researchers in order to present new results, exchange ideas and explore open problems.

Participants

Akhavan, Arya (Genova), Bartlett, Peter (Berkeley), Bellec, Pierre (Piscataway), Bing, Mike (Ithaca), Bölcskei, Helmut (Zürich), Brunel, Victor-Emmanuel (Palaiseau), Bühlmann, Peter (Zürich), Bunea, Florentina (Ithaca), Butucea, Cristina (Palaiseau), Carpentier, Alexandra (Potsdam), Cella, Leonardo (Genova), Chaudhuri, Kamalika (La Jolla), Chhor, Julien (Palaiseau), Chzhen, Evgenii (Orsay), Dalalyan, Arnak (Palaiseau), Drton, Mathias (Garching bei München), Emmenegger, Corinne (Zürich), Foygel Barber, Rina (Chicago), Gaucher, Solenne (Orsay), Giraud, Christophe (Orsay), Györfi, László (Budapest), Jamieson, Kevin (Seattle), Klopp, Olga (Cergy-Pontoise), Koltchinskii, Vladimir (Atlanta), Kur, Gil (Cambridge), Levina, Elizaveta (Ann Arbor), Lounici, Karim (Palaiseau), Mammen, Enno (Heidelberg), Montanari, Andrea (Stanford), Mourtada, Jaouad (Palaiseau), Nadler, Boaz (Rehovot), Ndaoud, Mohamed (Palaiseau), Nickl, Richard (Cambridge), Nowak, Robert (Madison), Olhede, Sofia (Lausanne), Papailiopoulos, Dimitris (Madison), Parhi, Rahul (Madison), Rigollet, Philippe (Cambridge), Rinaldo, Alessandro (Pittsburgh), Rohde, Angelika (Freiburg i. Br.), Schmidt-Hieber, Johannes (Enschede), Spokoiny, Vladimir G. (Berlin), Struwe, Julia (Leipzig), Tibshirani, Ryan (Pittsburgh), Tsybakov, Alexandre B. (Palaiseau), van de Geer, Sara (Zürich), Verzelen, Nicolas (Montpellier), Wahl, Martin (Berlin), Wang, Kaizheng (New York), Wegkamp, Marten (Ithaca), Yuan, Ming (New York), Zhang, Anru (Durham), Zhang, Cun-Hui (Piscataway), Zhou, Huibin (New Haven)

22.05. - 28.05.2022 **Deterministic Dynamics and Randomness in PDE**

Organizers: Andrea Nahmod, Amherst
Gigliola Staffilani, Cambridge MA
Hendrik Weber, Bath
Sijue Wu, Ann Arbor

Abstract

Over the last few years there has been spectacular progress in the study of parabolic SPDE, of nonlinear dispersive and wave equations and of probabilistic methods in PDE. An important direction connecting these three fields is the general question of how randomness affects the behavior of solutions to PDE. Research in recent years has been driven by the study of randomness in nonlinear evolution equations with a focus on the question of how to quantify the transport of such randomness under the nonlinear flow.

Participants

Agrawal, Siddhant (Madrid), Bailleuil, Ismael (Rennes), Banica, Valeria (Paris), Berti, Massimiliano (Trieste), Bringmann, Bjoern (Princeton), Bruned, Yvain (Edinburgh), Camps, Nicolas (Orsay), Carvalho Goncalves, Ana Patrícia (Lisboa), Chandra, Ajay (London), Chevyrev, Ilya (Edinburgh), de Lima Feltes, Guilherme (Bath), Deng, Yu (Los Angeles), Eceizabarrena, Daniel (Amherst), Fan, Chenjie (Beijing), Gassot, Louise (Basel), Grande, Ricardo (Paris), Gubinelli, Massimiliano (Bonn), Gunaratnam, Trishen (Genève), Hani, Zaher (Ann Arbor), Hannani, Amirali (Providence), Hoshino, Masato (Osaka), Ionescu, Alexandru D. (Princeton), Katsaros, Dean (Amherst), Krieger, Joachim (Lausanne), Li, Yao (Amherst), Lucà, Renato (Bilbao, Bizkaia), Lührmann, Jonas (College Station), Maspero, Alberto (Trieste), Miao, Shuang (Wuhan), Miller, Joseph (Austin), Nahmod, Andrea R. (Amherst), Otto, Felix (Leipzig), Patel, Neel (Madrid), Pausader, Benoit (Providence), Pavlovic, Natasa (Austin), Pusateri, Fabio (Toronto), Rosenzweig, Matthew (Cambridge), Roudenko, Svetlana (Miami), Schlag, Wilhelm (New Haven), Shahshahani, Sohrab (Amherst), Shao, Changyang (Cambridge), Shatah, Jalal (New York), Singh, Harprit (London), Sohinger, Vedran (Coventry), Staffilani, Gigliola (Cambridge), Su, Qingtang (Los Angeles), Sulem, Catherine (Toronto), Sun, Chenmin (Cergy-Pontoise), Tolomeo, Leonardo (Bonn), Tran, Minh-Binh (Dallas), Tzvetkov, Nikolay (Cergy-Pontoise), Vega, Luis (Bilbao, Bizkaia), Visciglia, Nicola (Pisa), Weber, Hendrik (Bath), Wilson, Bobby L.E. (Seattle), Wu, Sijue (Ann Arbor), Yu, Xueying (Seattle), Yue, Haitian (Shanghai), Zhu, Hui (Ann Arbor), Zhu, Rongchan (Beijing), Zhu, Xiangchan (Beijing)

29.05. - 04.06.2022 **Universality: Random Matrices, Random Geometry and SPDEs**

Organizers: Martin Hairer, London
Grégory Miermont, Lyon
Horng-Tzer Yau, Cambridge MA

Abstract
The postulate that large random systems can be described by limiting objects whose characteristic do not depend on the exact details of the models one started from is central in probability theory, under the name of universality. This workshop was aimed at uncovering the latest developments of this concept in the various topics where it is relevant, namely statistical physics, stochastic partial differential equations, random geometries and random matrices. It was in particular the occasion to feature some important recently introduced universal objects like the stochastic quantization of the Yang-Mills measure in dimensions 2 and 3, the KPZ fixed point, Liouville quantum gravity metrics and other objects connected to the Gaussian free field.

Participants
Aggarwal, Amol (Cambridge), Belyaev, Dmitry (Oxford), Bertacco, Federico (London), Bou-Rabee, Ahmed (Chicago), Brennecke, Christian (Bonn), Budzinski, Thomas (Lyon), Cannizzaro, Giuseppe (Coventry), Cerclé, Baptiste (Orsay), Chandra, Ajay (London), Chevyrev, Ilya (Edinburgh), Contat, Alice (Orsay), Curien, Nicolas (Orsay), Ding, Jian (Philadelphia), Dubedat, Julien (New York), Dubova, Sofiia (Cambridge), Ducatez, Raphaël (Lyon), Garban, Christophe (Villeurbanne), Gubinelli, Massimiliano (Bonn), Guionnet, Alice (Lyon), Gwynne, Ewain (Chicago), Hairer, Martin (London), Holden, Nina (Zürich), Jin, Ruhong (Oxford), Knowles, Antti (Genève), Ko, Justin (Lyon), Landon, Benjamin (Toronto), Le Gall, Jean-Francois (Orsay), Lehmkühler, Matthis (Zürich), Lupu, Titus (Paris), Miermont, Grégory (Lyon), Miller, Jason P. (Cambridge), Occelli, Alessandra (Lyon), Oikarinen, Joona (Helsinki), Quastel, Jeremy (Toronto), Rhodes, Rémi (Marseille), Riera, Armand (Zürich), Rodriguez, Pierre-Francois (London), Schröder, Dominik (Zürich), Schweiger, Florian (Rehovot), Shcherbina, Tatyana (Madison), Sheffield, Scott (Cambridge), Shen, Hao (Madison), Sznitman, Alain-Sol (Zürich), Unel, Meltem (København), Virág, Bálint (Toronto), Werner, Wendelin (Zürich), Wu, Baojun (Marseille), Yau, Horng-Tzer (Cambridge), Yu, Pu (Cambridge), Zeitouni, Ofer (Rehovot), Zhu, Rongchan (Beijing), Zhu, Xiangchan (Beijing)

12.06. - 18.06.2022 **Geometrie**

Organizers: Aaron Naber, Evanston
André Neves, Chicago
Burkhard Wilking, Münster

Abstract
The workshop Geometrie was well attended with over 42 participants (35 in person and 7 online) with broad geographic representation from all continents, and held in a very active atmosphere. During the meeting, various interesting topics in geometry were discussed, such as geometric flows, Einstein manifolds and spaces with sectional curvature bounds. The workshop consisted of 18 one hour talks and 3 half hour after dinner talks. The after dinner talks were given by PhD students and very recent PhD's.

Participants
Abja, Soufian (Münster), Araújo, Roberto (Münster), Bettiol, Renato G. (Bronx), Biquard, Olivier (Paris), Böhm, Christoph (Münster), Bruè, Elia (Princeton), Dai, Xianzhe (Santa Barbara), Di Nezza, Eleonora (Paris), Hamenstädt, Ursula (Bonn), Haslhofer, Robert (Toronto), Huisken, Gerhard (Tübingen), Jäckel, Frieder (Bonn), Jiang, Wenshuai (Hangzhou), Kopfer, Eva (Bonn), Krishnan, Anusha M. (Münster), Lamm, Tobias (Karlsruhe), Li, Chao (New York), Li, Yangyang (Princeton), Lott, John (Berkeley), Lowe, Ben (Princeton), Mantoulidis, Christos (Houston), Mazurowski, Liam (Ithaca), McCormick, Anthony (Evanston), Miskiewicz, Michal (Warszawa), Mondino, Andrea (Oxford), Naber, Aaron C. (Evanston), Neumayer, Robin (Pittsburgh), Neves, André A. (Chicago), Nienhaus, Jan (Münster), Pan, Jiayin (Toronto), Petrunin, Anton (University Park), Rademacher, Hans-Bert (Leipzig), Santoro, Bianca (Münster), Semola, Daniele (Oxford), Simon, Miles (Magdeburg), Song, Antoine Y. (Berkeley), Stern, Daniel (Chicago), Sturm, Theo (Bonn), Sukhorebska, Darya (Kharkiv), Sun, Ao (Bethlehem), Taimanov, Iskander A. (Novosibirsk), Topping, Peter M. (Coventry), Tuschmann, Wilderich (Karlsruhe), Wei, Guofang (Santa Barbara), Wiemeler, Michael (Münster), Wilking, Burkhard (Münster), Wink, Matthias (Münster), Wulle, Dennis (Münster), Zarei, Masoumeh (Münster), Zhou, Xin (Ithaca), Zhu, Jintian (Beijing)

19.06. - 25.06.2022 **Hilbert Complexes: Analysis, Applications, and Discretizations**

Organizers: Ana M. Alonso Rodriguez, Trento
Douglas N. Arnold, Minneapolis
Dirk Pauly, Dresden
Francesca Rapetti, Nice

Abstract
In this workshop 70 (43 at MFO, 27 online) leading mathematicians from Europe, United States, China, and Australia met at the MFO to discuss and present new developments in the mathematical and numerical analysis including discretizations of Hilbert complexes related to systems of partial differential equations, in particular the well known de Rham complex and the complexes of elasticity and the biharmonic equations.

Participants
Alonso Rodriguez, Ana (Povo), Antonietti, Paola F. (Milano), Arnold, Douglas N. (Minneapolis), Beirao da Vega, Lourenco (Milano), Berchenko-Kogan, Yakov (University Park), Bertrand, Fleurianne (Enschede), Boffi, Daniele (Thuwal), Bonizzoni, Francesca (Augsburg), Boon, Wietse (Stockholm), Bossavit, Alain (Gif-sur-Yvette), Braess, Dietrich (Bochum), Buffa, Annalisa (Lausanne), Cap, Andreas (Wien), Chen, Long (Irvine), Christiansen, Snorre Harald (Oslo), Ciarlet, Philippe G. (Kowloon Tong), Costabel, Martin (Rennes), Dassi, Franco (Milano), Dauge, Monique (Rennes), Demkowicz, Leszek F. (Austin), Demlow, Alan (College Station), Di Pietro, Daniele (Montpellier), Dumbser, Michael (Trento), Dziubek, Andrea (Albany), Eastwood, Michael (Adelaide), Egger, Herbert (Linz), Endtmayer, Bernhard (Hannover), Falk, Richard S. (Piscataway), Flode, Bernt Jonas (Oslo), Gawlik, Evan (Honolulu), Gopalakrishnan, Jay (Portland), Guzman, Johnny (Providence), Hauser, Julia (Dresden), Hiptmair, Ralf (Zürich), Hirani, Anil N. (Urbana), Holmen, Daniel Forland (Bergen), Holst, Michael (La Jolla), Hu, Jun (Beijing), Hu, Kaibo (Oxford), Huang, Xuehai (Shanghai Shi), Kettunen, Lauri (Jyväskylä), Kurz, Stefan (Jyväskylä), Licht, Martin (Lausanne), Monk, Peter (Newark), Mönkölä, Sanna (Jyväskylä), Neilan, Michael J. (Pittsburgh), Neunteufel, Michael (Wien), Oh, Minah (Harrisonburg), Pauly, Dirk (Dresden), Pechstein, Astrid (Linz), Picard, Rainer (Dresden), Rapetti, Francesca (Nice), Rossi, Tuomo (Jyväskylä), Russo, Alessandro (Milano), Sande, Espen (Lausanne), Sander, Oliver (Dresden), Schöberl, Joachim (Wien), Schomburg, Michael (Essen), Schulz, Erick (Zürich), Stern, Ari (St. Louis), Trostorff, Sascha (Kiel), Valli, Alberto (Povo), van Goethem, Nicolas (Lisboa), Wang, Wei (Minneapolis), Weggler, Lucy (Berlin), Winther, Ragnar (Oslo), Xu, Jinchao (University Park), Zaccaron, Michele (Padova), Zampa, Enrico (Povo), Zulehner, Walter (Linz)

26.06. - 02.07.2022 **Nonlinear Waves and Dispersive Equations**

Organizers: Herbert Koch, Bonn
Pierre Raphaël, Cambridge
Daniel Tataru, Berkeley
Monica Visan, Los Angeles

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 solitons and scattering. They are linked to many areas of mathematics and physics, ranging from integrable systems and harmonic analysis to fluid dynamics, geometry and general relativity and probability.

Participants

Adams, Joseph (Düsseldorf), Ai, Albert (Madison), Alama Bronsard, Yvonne (Paris), Alazard, Thomas (Gif-sur-Yvette), Banica, Valeria (Paris), Bejenaru, Ioan (La Jolla), Bringmann, Bjoern (Princeton), Burq, Nicolas (Orsay), Candy, Timothy (Dunedin), Chapouto, Andreia (Los Angeles), Chen, Gong (Lexington), Collot, Charles (Cergy-Pontoise), D'Ancona, Piero (Roma), Dodson, Benjamin (Baltimore), Donninger, Roland (Wien), Forlano, Justin (Los Angeles), Gerard, Patrick (Orsay), Herr, Sebastian (Bielefeld), Ifrim, Mihaela (Madison), Jendrej, Jacek (Villetaneuse), Killip, Rowan (Los Angeles), Klaus, Friedrich (Karlsruhe), Koch, Herbert (Bonn), Krieger, Joachim (Lausanne), Laurens, Thierry (Los Angeles), Lawrie, Andrew (Cambridge), Lenzmann, Enno (Basel), Li, Zexing (Cambridge), Liao, Xian (Karlsruhe), Liu, Baoping (Beijing), Lührmann, Jonas (College Station), Marzuola, Jeremy L. (Chapel Hill), Murphy, Jason C. (Rolla), Nakanishi, Kenji (Kyoto), Ntekoume, Maria (Houston), Oh, Sung-Jin (Berkeley), Pausader, Benoit (Providence), Pompili, Lorenzo (Bonn), Raphaël, Pierre (Cambridge), Rowan, James (Berkeley), Said, Ayman (Durham), Schippa, Robert (Karlsruhe), Schörkhuber, Birgit (Innsbruck), Stingo, Annalaura (Palaiseau), Szeftel, Jérémie (Paris), Tataru, Daniel (Berkeley), Vega, Luis (Bilbao, Bizkaia), Visan, Monica (Los Angeles), Wang, Yuzhao (Birmingham), Yu, Dongxiao (Bonn), Zhao, Lifeng (Hefei)

03.07. - 09.07.2022 **Real Analysis, Harmonic Analysis and Applications**

Organizers: Michael Christ, Berkeley
Detlef Müller, Kiel
Christoph Thiele, Bonn
Ana Vargas, Madrid

Abstract

The workshop focused on important developments within the last few years in real and harmonic analysis including nonlinear Carleson theorems and singular integral theory, Fourier restriction theory and spherical maximal functions as well as concurrent progress in the application of these for example to partial differential equations. The meeting took place in a lively and active atmosphere, and greatly benefited from the ideal environment at Oberwolfach. After more than two years of the Covid 19 pandemic, it was refreshing to many to return to a workshop in presence, aided by good measures at the Institute.

Participants

Beltran, David (Madison), Bennett, Jonathan (Birmingham), Buschenhenke, Stefan (Kiel), Carbery, Anthony (Edinburgh), Carneiro, Emanuel (Trieste), Christ, Michael (Berkeley), Ciccone, Valentina (Bonn), Cowling, Michael G. (Sydney), Durcik, Polona (Orange), Eceizabarrena, Daniel (Amherst), Fraccaroli, Marco (Bonn), Frey, Dorothee (Karlsruhe), Goncalves, Felipe (Bonn), Gressman, Philip (Philadelphia), Hickman, Jonathan (Edinburgh), Iliopoulou, Marina (Birmingham), Koch, Herbert (Bonn), Lee, Sanghyuk (Seoul), Li, Zane (Bloomington), Lin, Fred (Bonn), Maldague, Dominique (Cambridge), Martini, Alessio (Torino), Mirek, Mariusz (Piscataway), Mnatsakanyan, Gevorg (Bonn), Müller, Detlef (Kiel), Negro, Giuseppe (Lisboa), Niedorf, Lars (Kiel), Oliveira e Silva, Diogo (Lisboa), Palle, Ljudevit (Zagreb), Pierce, Lillian Beatrix (Durham), Poltoratski, Alexei (Madison), Ponce-Vanegas, Felipe (Bilbao, Bizkaia), Ramos, João Pedro (Zürich), Ricci, Fulvio (Pisa), Roos, Joris (Lowell), Saari, Olli (Bonn), Seeger, Andreas (Madison), Slavikova, Lenka (Praha), Sogge, Christopher D. (Baltimore), Srivastava, Rajula (Madison), Stovall, Betsy (Madison), Szarek, Tomasz (Bilbao, Bizkaia), Tataru, Daniel (Berkeley), Thiele, Christoph (Bonn), Vargas, Ana (Madrid), Volberg, Alex (East Lansing), Wright, Jim R. (Edinburgh), Zahl, Joshua (Vancouver)

10.07. - 16.07.2022 **Algebraic Geometry: Moduli Spaces, Birational Geometry and Derived Aspects**

Organizers: Christopher Hacon, Salt Lake City
Daniel Huybrechts, Bonn
Richard Thomas, London
Chenyang Xu, Princeton

Abstract
The workshop covered recent developments in algebraic geometry in a broad sense with a special emphasis on various moduli spaces. Problems related to mirror symmetry phenomena were discussed in a number of talks as well as singularity theory in the context of the MMP in positive characteristic. Derived categories and algebraic cycles, as well as rationality questions figured prominently in the talks and the discussions.

Participants
Addington, Nicolas (Eugene), Arvidsson, Emilie (Princeton), Beckmann, Thorsten (Bonn), Belmans, Pieter (Esch-sur-Alzette), Bernasconi, Fabio (Lausanne), Blum, Harold (Salt Lake City), Cascini, Paolo (London), Castravet, Ana-Maria (Versailles), Charles, Francois (Paris), DeVleming, Kristin (Amherst), Druel, Stephane (Villeurbanne), Dutta, Yajnaseni (Bonn), Feyzbakhsh, Soheyla (London), Filipazzi, Stefano (Lausanne), Fu, Lie (Nijmegen), Gibney, Angela (Philadelphia), Gongyo, Yoshinori (Tokyo), Grassi, Antonella (Bologna), Gross, Mark (Cambridge), Hacon, Christopher D. (Salt Lake City), Huybrechts, Daniel (Bonn), Kaloghiros, Anne-Sophie (Uxbridge), Kovács, Sándor J. (Seattle), Lesieutre, John (University Park), Liu, Yuchen (Evanston), Martin, Gebhard (Bonn), Mauri, Mirko (Ann Arbor), Mazzon, Enrica (Ann Arbor), Mustata, Mircea (Ann Arbor), Nesterov, Denis (Bonn), Nicaise, Johannes (London), Oberdieck, Georg (Bonn), Ottem, John Christian (Oslo), Patakfalvi, Zsolt (Lausanne), Pertusi, Laura (Milano), Polishchuk, Alexander (Eugene), Popa, Mihnea (Cambridge), Rennemo, Jorgen (Oslo), Saccà, Giulia (New York), Schwede, Karl (Salt Lake City), Svaldi, Roberto (Lausanne), Tevelev, Jenia (Amherst), Thomas, Richard P. W. (London), Toda, Yukinobu (Kashiwa), Xie, Fei (Edinburgh), Xu, Chenyang (Princeton), Yin, Qizheng (Beijing), Zhou, Chuyu (Lausanne)

17.07. - 23.07.2022 **The Renormalization Group**

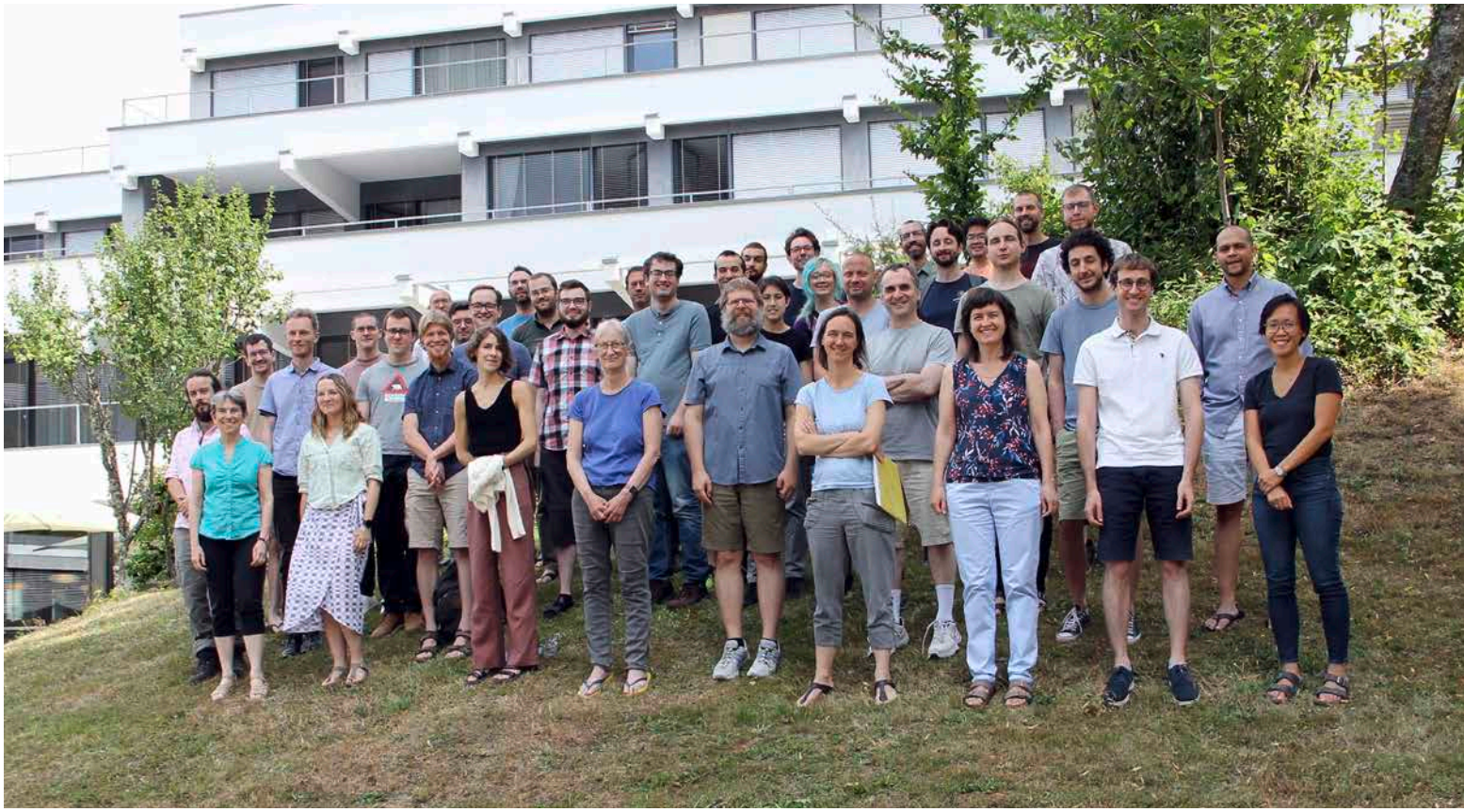
Organizers: Roland Bauerschmidt, Cambridge UK
Margherita Disertori, Bonn
Stefan Hollands, Leipzig
Manfred Salmhofer, Heidelberg

Abstract

The renormalization group was originally introduced as a multiscale approach to quantum field theory and the theory of critical phenomena, explaining in particular the universality observed e.g. in critical exponents. Over the years it has become a powerful tool in the mathematical analysis of systems with infinitely many interacting degrees of freedom. Its applications include quantum field theories, classical and quantum statistical mechanics, (stochastic) partial differential equations, operator theory, and probability theory. For some important problems, it is the only known tool for mathematical proofs. This workshop has given an account of the most important new developments in the last five years, including methodical progress, current applications, relations to other approaches, and identified new challenges that may be tackled in future work with the help of the renormalization group.

Participants

Abdesselam, Abdelmalek (Charlottesville), Adams, Stefan (Coventry), Bach, Volker (Braunschweig), Barashkov, Nikolay (Helsinki), Bauerschmidt, Roland (Cambridge), Borji, Majdouline (Palaiseau), Bru, Jean-Bernard (Bilbao, Bizkaia), Cao, Sky (Stanford), Cenatiempo, Serena (L'Aquila), Chandra, Ajay (London), Chatterjee, Sourav (Stanford), Crawford, Nicholas J. (Haifa), Dagallier, Benoit (Cambridge), Disertori, Margherita (Bonn), Duch, Pawel (Poznań), Ferdinand, Léonard (Orsay), Fresta, Luca (Bonn), Fröhlich, Jürg M. (Zürich), Gubinelli, Massimiliano (Bonn), Gurau, Razvan (Heidelberg), Helmuth, Tyler (Durham), Hollands, Stefan (Leipzig), Kennedy, Tom (Tucson), Knörrer, Horst (Zürich), Koller, Andreas (Coventry), Kopper, Christoph (Palaiseau), Kroschinsky, Wilhelm (São Paulo), Marchetti, Domingos H. U. (São Paulo), Mastropietro, Vieri (Milano), Merkl, Franz (München), Merz, Konstantin (Braunschweig), Park, Jiwoon (Cambridge), Pedra, Walter (São Paulo), Pizzo, Alessandro (Roma), Porta, Marcello (Trieste), Rejzner, Kasia (Heslington, York), Rivasseau, Vincent (Orsay), Rodriguez, Pierre-Francois (London), Rolles, Silke (Garching bei München), Rychkov, Vyacheslav (Bures-sur-Yvette), Salmhofer, Manfred (Heidelberg), Seiler, Erhard (München), Slade, Gordon (Vancouver), Stottmeister, Alexander (Hannover), Tanimoto, Yoh (Roma), Toninelli, Fabio (Wien), Verstraete, Frank (Gent), Vignes-Tourneret, Fabien (Villeurbanne), Wald, Robert (Chicago), Zahn, Jochen (Leipzig), Zirnbauer, Martin (Köln)



24.07. - 30.07.2022 **Topologie**

Organizers: Mark Behrens, Notre Dame
Ruth Charney, Waltham
Søren Galatius, Copenhagen
András Stipsicz, Budapest

Abstract

The lectures in the workshop covered various topics in modern topology, including algebraic and geometric topology, homotopy theory, geometric group theory, and manifold topology, as well as connections to neighboring areas, most prominently symplectic topology/geometry. The following current research topics received more attention during the workshop: manifolds and K-theory, symplectic topology and Floer homology, generalizations of hyperbolic techniques in geometric group theory, and equivariant and motivic homotopy theory. The aim of the various topics was to foster communication and provide chances for participants to see and experience driving questions and important methods in nearby fields within the realm of topology.

Participants

Abouzaid, Mohammed (Stanford), Alvarez-Gavela, Daniel (Cambridge), Arzhantseva, Goulnara N. (Wien), Aumonier, Alexis (København), Barthel, Tobias (Bonn), Behrens, Mark Joseph (Notre Dame), Belmont, Eva (La Jolla), Bowden, Jonathan (Regensburg), Boyd, Rachael Jane (Cambridge), Bregman, Corey (Portland), Charney, Ruth (Waltham), Chatterji, Indira (Nice), Conway, Anthony (Cambridge), Cordes, Matthew (Zürich), Dai, Irving (Stanford), Fioravanti, Elia (Bonn), Galatius, Søren (København), Gironella, Fabio (Berlin), Golla, Marco (Nantes), Hahn, Jeremy (Cambridge), Heller, Jeremiah (Urbana), Hill, Michael (Los Angeles), Hom, Jennifer (Atlanta), Kragh, Thomas (Uppsala), Kranhold, Florian (Bonn), Krannich, Manuel (Karlsruhe), Kubasch, Alexander Arnd (Budapest), Kupers, Alexander (Toronto), Land, Markus (München), Lenz, Tobias (Bonn), Marengon, Marco (Budapest), Martin, Alexandre (Edinburgh), Meier, Lennart (Utrecht), Miller, Maggie (Stanford), Nariman, Sam (West Lafayette), Nikolaus, Thomas (Münster), Piccirillo, Lisa M. (Cambridge), Putman, Andrew (Notre Dame), Randal-Williams, Oscar (Cambridge), Schlank, Tomer (Jerusalem), Smith, Ivan (Cambridge), Spriano, Davide (Oxford), Stipsicz, András I. (Budapest), Stojanoska, Vesna (Urbana), Tshishiku, Bena (Providence), Vogtmann, Karen L. (Coventry), Wahl, Nathalie (København), Xu, Zhouli (La Jolla)

31.07. - 06.08.2022 **Non-Commutative Geometry and Cyclic Homology**

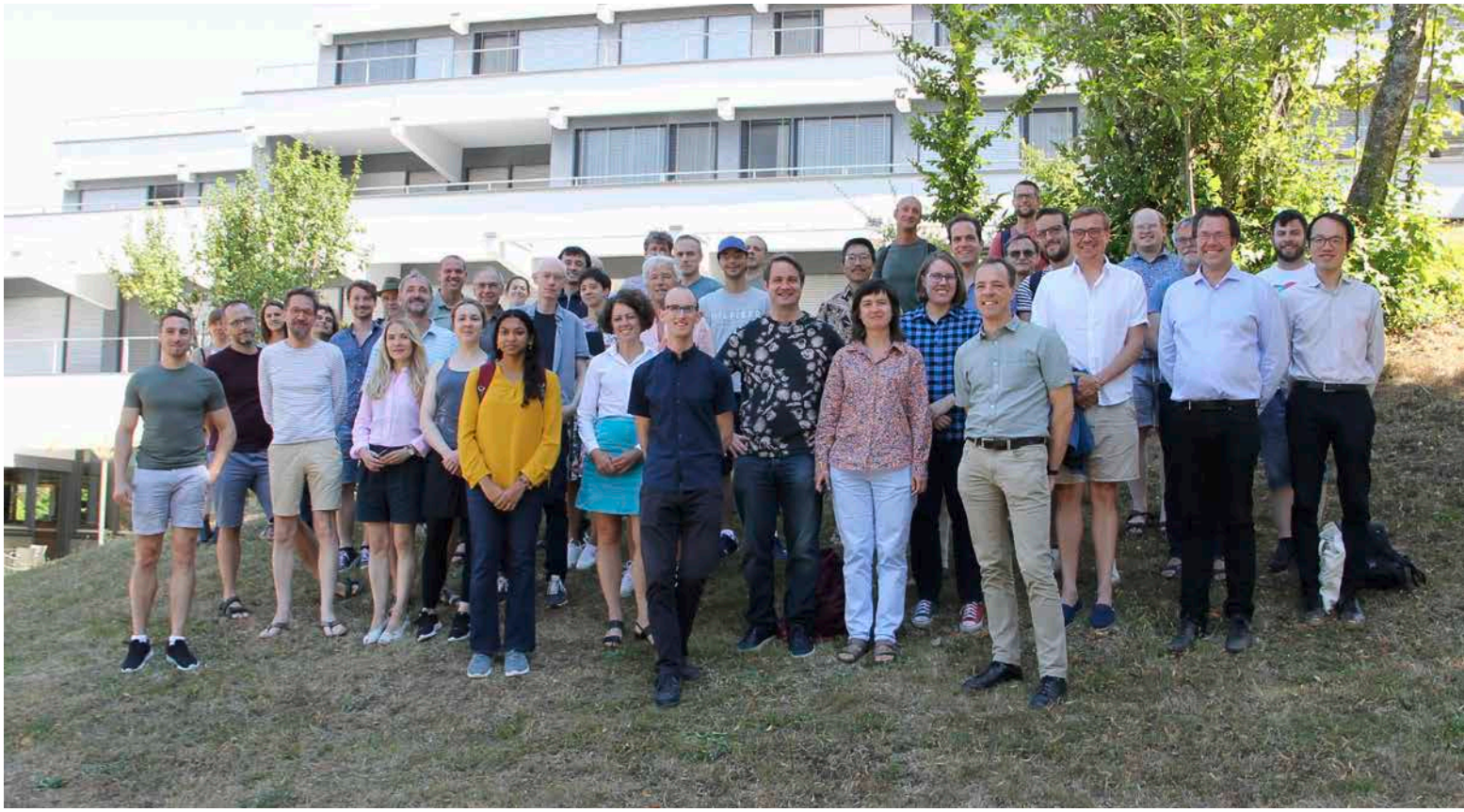
Organizers: Alain Connes, Bur-sur-Yvette
Ryszard Nest, Copenhagen
Thomas Nikolaus, Münster
Guoliang Yu, College Station

Abstract

Cyclic cohomology, since its discovery forty years ago in noncommutative differential geometry, has developed as a fundamental mathematical tool with applications in domains as diverse as analysis, algebraic K-theory, algebraic geometry, arithmetic geometry, solid state physics and quantum field theory. The meeting provided a user friendly introduction to sophisticated domains of applications. The main goal of the meeting was to create an interaction between the two domains where the theory is most active: noncommutative geometry and analysis on one hand and on the other the highly successful topological cyclic homology (TC) and topological Hochschild homology (THH) introduced by Bokstedt, Hsiang and Madsen in the world of ring spectra.

Participants

Antieau, Benjamin (Evanston), Chen, Xiaoman (Shanghai Shi), Connes, Alain (Bures-sur-Yvette), Consani, Caterina (Baltimore), Cortinas, Guillermo (Buenos Aires), Cuntz, Joachim (Münster), Efimov, Alexander I. (Moscow), Getzler, Ezra (Evanston), Gong, Sherry (College Station), Hesselholt, Lars (Nagoya), Höning, Eva (Nijmegen), Khalkhali, Masoud (London), Krause, Achim (Münster), Land, Markus (München), Landi, Giovanni (Trieste), Lindenstrauss, Ayelet (Bloomington), Lorentz, Matthew (East Lansing), McCandless, Jonas (Münster), Meyer, Ralf (Göttingen), Moscovici, Henri (Columbus), Mukherjee, Devarshi (Göttingen), Nest, Ryszard (København), Nikolaus, Thomas (Münster), Nistor, Victor (Metz), Piazza, Paolo (Roma), Prodan, Emil (New York), Richter, Birgit (Hamburg), Rodsphon, Rudy (St. Louis), Schick, Thomas (Göttingen), Schrohe, Elmar (Hannover), Sukochev, Fedor (Sydney), Tamme, Georg (Mainz), Tang, Xiang (St. Louis), Tsygan, Boris (Evanston), van Suijlekom, Walter D. (Nijmegen), Wang, Hang (Shanghai), Wang, Jinmin (College Station), Wu, Jianchao (Shanghai Shi), Xie, Zhizhang (College Station), Yao, Yi-Jun (Shanghai Shi), Yu, Guoliang (College Station), Zakharevich, Inna (Ithaca), Zeidler, Rudolf (Münster), Zenobi, Vito Felice (Roma)



07.08. - 13.08.2022 **C*-Algebras**

Organizers: Dimitri Shlyakhtenko, Los Angeles
Andreas Thom, Dresden
Stefaan Vaes, Leuven
Wilhelm Winter, Münster

Abstract

Operator algebras form a very active area of mathematics which, since its inception in the 1940s, has always been driven by interactions with other fields of mathematics and physics. The scope of these interactions is very wide, ranging over dynamical systems, (non-commutative) geometry, functional analysis, (geometric) group theory, topology, random matrices, harmonic analysis and quantum information theory. The goals of this workshop were to stimulate new collaborations across these fields of mathematics, to disseminate recent progress by giving participants a global view on the subject and to specially focus on two important developments: the solution of the Connes embedding problem by methods from quantum information theory and the progress on noncommutative dynamical systems, especially in the topological C*-algebra context.

Participants

an Huef, Astrid (Wellington), Armstrong, Becky (Münster), Arzhantseva, Goulnara N. (Wien), Courtney, Kristin (Münster), Dadarlat, Marius (West Lafayette), Duwenig, Anna (Wollongong), Echterhoff, Siegfried (Münster), Eilers, Soren (København), Elliott, George A. (Toronto), Farah, Ilijas (Toronto), Gabe, James (Odense), Ganesan, Priyanga (College Station), Geffen, Shirly (Leuven), Gerasimova, Maria (Münster), Hayes, Benjamin R. (Charlottesville), Ioana, Adrian (La Jolla), Jekel, David (La Jolla), Junge, Marius (Urbana), Kennedy, Matthew (Waterloo), Kerr, David (Münster), Klisse, Mario (Delft), Li, Xin (Glasgow), Lin, Huaxin (Eugene), Marrakchi, Amine (Lyon), Musat, Magdalena E. (København), Ozawa, Narutaka (Kyoto), Pisier, Gilles (College Station), Popa, Sorin (Los Angeles), Raum, Sven (Stockholm), Reznikoff, Sarah (Manhattan), Rordam, Mikael (København), Schafhauser, Christopher (Lincoln), Shlyakhtenko, Dimitri (Los Angeles), Sims, Aidan (Wollongong), Skalski, Adam (Warszawa), Slofstra, William E. (Waterloo), Spaas, Pieter (København), Speicher, Roland (Saarbrücken), Strung, Karen (Praha), Szabó, Gábor (Leuven), Thom, Andreas B. (Dresden), Tikuisis, Aaron (Ottawa), Ursu, Dan (Waterloo), Vaes, Stefaan (Leuven), Voiculescu, Dan-Virgil (Berkeley), White, Stuart (Oxford), Willett, Rufus E. (Honolulu), Winter, Wilhelm (Münster)

14.08. - 20.08.2022 **Calculus of Variations**

Organizers: Lia Bronsard, Hamilton
László Székelyhidi, Leipzig
Yoshihiro Tonegawa, Tokyo
Tatiana Toro, Seattle

Abstract

The Calculus of Variations is at the same time a classical subject, with long-standing open questions which have generated exciting discoveries in recent decades, and a modern subject in which new types of questions arise, driven by mathematical developments and emergent applications. It is also a subject with a very wide scope, touching on interrelated areas that include geometric variational problems, optimal transportation, geometric inequalities and domain optimization problems, elliptic regularity, geometric measure theory, harmonic analysis, physics, free boundary problems, etc. The workshop balances the traditional interests of past conferences with new emerging perspectives.

Participants

Bellettini, Costante (London), Bourni, Theodora (Knoxville), Bronsard, Lia (Hamilton), Chambolle, Antonin (Paris), Choksi, Rustum (Montréal), Colinet, Andrew (Hamilton), Cristoferi, Riccardo (Nijmegen), Daneri, Sara (L'Aquila), De Filippis, Cristina (Parma), De Rosa, Antonio (College Park), Engelstein, Max (Minneapolis), Faraco, Daniel (Madrid), Giorgi, Tiziana (Las Cruces), Gmeineder, Franz (Konstanz), Golovaty, Dmitry (Akron), Guerra, Andre (Princeton), Hirsch, Jonas (Leipzig), Huisken, Gerhard (Tübingen), Kirchheim, Bernd (Leipzig), Kriventsov, Dennis (Piscataway), Kwon, Hyunju (Zürich), Lamy, Xavier (Toulouse), Lorent, Andrew (Cincinnati), Massaccesi, Annalisa (Vicenza (ITALY)), Menne, Ulrich (Taipei), Morini, Massimiliano (Parma), Novack, Michael (Austin), Olbermann, Heiner (Louvain-la-Neuve), Pluda, Alessandra (Pisa), Raita, Bogdan (Pisa), Rindler, Filip (Coventry), Sandier, Etienne (Créteil), Scardia, Lucia (Edinburgh), Schiffer, Stefan (Bonn), Schulze, Felix (Coventry), Serra, Joaquim (Zürich), Smit Vega Garcia, Mariana (Bellingham), Spolaor, Luca (San Diego), Stantejsky, Dominik (Palaiseau), Sternberg, Peter (Bloomington), Stuvard, Salvatore (Milano), Székelyhidi Jr., László (Leipzig), Tarantello, Gabriella (Roma), Tione, Riccardo (Leipzig), Tonegawa, Yoshihiro (Tokyo), Topaloglu, Ihsan (Richmond), Toro, Tatiana (Seattle), Venkatraman, Raghav (New York), Westdickenberg, Maria G. (Aachen), White, Brian (Stanford), Wickramasekera, Neshan (Cambridge), Zhao, Zihui (Chicago)

21.08. - 27.08.2022 **Mathematical Imaging and Surface Processing**

Organizers: Mirela Ben-Chen, Haifa
Antonin Chambolle, Paris
Martin Rumpf, Bonn
Peter Schröder, Pasadena

Abstract

This workshop was gathering applied mathematicians and computer scientists interested in image and geometry processing. These topics have developed tremendously in the past few years with the rise of artificial intelligence, parallel hardware and strong needs for real-world applications (3D scene reconstruction, architecture, medical imaging and data analysis, etc). These research fields are at the intersection of many mathematical disciplines, from geometry, calculus of variations and optimization to the analysis and numerical analysis of PDEs. The almost 50 participants to this workshop, including many young researchers, had many fruitful exchanges, interested in common issues and speaking a common language, yet often coming from different backgrounds and with different knowledge.

Participants

Abaach, Mariem (Paris), Amenta, Nina (Davis), Azencot, Omri (Beer-Sheva), Ben-Chen, Mirela (Haifa), Botsch, Mario (Dortmund), Bracha, Amit (Haifa), Braunsmann, Juliane (Münster), Bronstein, Alexander (Haifa), Bucur, Dorin (Le Bourget-du-Lac), Buet, Blanche (Orsay), Chambolle, Antonin (Paris), Chern, Albert R. (La Jolla), Crane, Keenan (Pittsburgh), Dai, Angela (Garching bei München), Desbrun, Mathieu (Pasadena), Diamanti, Olga (Graz), Edelstein, Michal (Haifa), Feydy, Jean (Issy-les-Moulineaux), Gladbach, Peter (Bonn), Grinspun, Eitan (Toronto), Grohs, Philipp (Wien), Guibas, Leonidas J. (Stanford), Hartwig, Florine (Bonn), Hildebrandt, Klaus (Delft), Kimmel, Ron (Haifa), Knöppel, Felix J. (Berlin), Lorenz, Dirk (Braunschweig), Mitra, Niloy (London), Neumayer, Sebastian (Lausanne), Novaga, Matteo (Pisa), Pennec, Xavier (Sophia-Antipolis), Pinkall, Ulrich (Berlin), Pottmann, Helmut (Thuwal), Rorberg, Shir (Haifa), Rotstein, Noam (Haifa), Rumpf, Martin (Bonn), Sassen, Josua (Bonn), Scherzer, Otmar (Wien), Schönlieb, Carola-Bibiane (Cambridge), Schröder, Peter (Pasadena), Schumacher, Henrik (Chemnitz), Schwarz, Simon (Göttingen), Sharp, Nicholas (Toronto), Soliman, Yousuf (Pasadena), Solomon, Justin (Cambridge), Sorkine-Hornung, Olga (Zürich), Stantejsky, Dominik (Palaiseau), Steidl, Gabriele (Berlin), Stein, Oded (Cambridge), Trouvé, Alain (Gif-sur-Yvette), Vialard, Francois-Xavier (Marne-la-Vallée), Vouga, Etienne (Austin), Wallner, Johannes (Graz), Wardetzky, Max (Göttingen), Wirth, Benedikt (Münster), Younes, Laurent (Baltimore), Zorin, Denis (New York)

28.08. - 03.09.2022 **Character Theory and Categorification**

Organizers: Christine Bessenrodt, Hannover
Christopher Bowman, York
Eugenio Giannelli, Florence
Alexander Kleshchev, Eugene

Abstract

Over a hundred years after the work of Frobenius and Schur, the sheer enormity of what is not known about the character theory of symmetric and alternating groups continues to surprise and awe the uninitiated. How does one decompose the tensor product of a pair of complex characters? Or the restriction of a complex character to a Sylow or wreath product subgroup? Can we understand the vanishing sets of complex characters? What about the asymptotic behaviour of complex characters? What are the dimensions of the modular characters? These questions have been hailed as some of the definitive open problems in representation theory and algebraic combinatorics, they have deep connections with Lie theory, group theory, local-global conjectures in representation theory of finite groups, symplectic geometry, complexity theory, statistical mechanics and quantum information theory.

Participants

Ariki, Susumu (Osaka), Bowman, Christopher D. (York), Brundan, Jonathan (Eugene), Coulembier, Kevin (Sydney), De Visscher, Maud (London), Fayers, Matthew (London), Geranios, Haralampos (York), Gerber, Thomas (Lausanne), Giannelli, Eugenio (Firenze), Gonzalez, Nicolle (Los Angeles), Gurevich, Max (Haifa), Hazi, Amit (London), Homma, Adrian (Hannover), Ikenmeyer, Christian (Liverpool), Jacon, Nicolas (Reims), Lanini, Martina (Roma), Law, Stacey (Cambridge), Libedinsky, Nicolas (Región Metropolitana de Santiago), Livesey, Michael (Manchester), Malle, Gunter (Kaiserslautern), Mathas, Andrew (Sydney), McDowell, Eoghan (Okinawa), McNamara, Peter J. (Parkville), Miller, Alexander R. (Minneapolis), Minets, Alexandre (Edinburgh), Morotti, Lucia (Hannover), Muth, Robert (Pittsburgh), Navarro, Gabriel (Burjassot), Norton, Emily (Canterbury), Orellana, Rosa C. (Hanover), Ostrik, Viktor (Eugene), Pacifici, Emanuele (Firenze), Paget, Rowena (Canterbury), Plaza, David (Talca), Poulain d'Andecy, Loic (Reims), Putignano, Lorenzo (Firenze), Riche, Simon (Aubière), Rosas, Mercedes H. (Sevilla), Simental Rodriguez, José (Bonn), Speyer, Liron (Okinawa), Stroppel, Catharina (Bonn), Sutton, Louise (Okinawa), Tubbenhauer, Daniel (Sydney), Vallejo Rodríguez, Carolina (Firenze), Varagnolo, Michela (Cergy-Pontoise), Volpato, Giada (Firenze), Webster, Ben (Waterloo), Wildon, Mark (Bristol), Zabrocki, Mike (Toronto)

04.09. - 10.09.2022 **Complex Geometry and Dynamical Systems**

Organizers: Tien-Cuong Dinh, Singapore
George Marinescu, Köln
Valentino Tosatti, Montréal
Elizabeth Wulcan, Gothenburg

Abstract

Complex geometry is a highly attractive branch of modern mathematics that witnesses active and successful research. Due to its interactions with various other fields (differential, algebraic, and arithmetic geometry, but also mathematical physics), it has become an area with many facets. The connection to Dynamical Systems is particularly fruitful. The workshop focused on recent developments in holomorphic dynamics, several complex variables and complex geometry. The topics of the talks included dynamics of holomorphic and rational maps, the theory of currents, the Bergman kernel, together with applications in geometry, dynamics, foliations and mathematical physics.

Participants

Abate, Marco (Pisa), Abboud, Marc (Rennes), Andersson, Mats (Göteborg), Apredoaei, Razvan (Paris), Auvray, Hugues (Orsay), Bi, Enchao (Qingdao), Bianchi, Fabrizio (Villeneuve d'Ascq), Biard, Severine (Valenciennes), Brinkschulte, Judith (Leipzig), Cantat, Serge (Rennes), Cao, Junyan (Nice), Chiose, Ionut (Bucharest), Dang, Nguyen-Bac (Orsay), Datar, Ved (Bangalore, Bengaluru), Diller, Jeffrey (Notre Dame), Dinh, Tien-Cuong (Singapore), Favre, Charles (Palaiseau), Filip, Simion (Chicago), Finski, Siarhei (Palaiseau), Fornaess, John Erik (Trondheim), Greb, Daniel (Essen), Guedj, Vincent (Toulouse), Hamenstädt, Ursula (Bonn), Herrmann, Hendrik (Wuppertal), Hsiao, Chin-Yu (Taipei), Huang, Xiaojun (Piscataway), Hwang, Jun-Muk (Daejeon), Jang, Seung uk (Chicago), Joita, Cezar (Bucharest), Kaufmann, Lucas (Daejeon), Kim, Sung Yeon (Daejeon), Klevtsov, Semyon (Strasbourg), Koike, Takayuki (Osaka), Liu, Bingxiao (Köln), Lu, Hoang Chinh (Orsay), Lu, Wen (Wuhan), Ma, Xiaonan (Paris), Marinescu, George (Köln), Matsumura, Shin-ichi (Sendai), Muhan, Luo (Singapore), Nguyen, Viet Anh (Villeneuve d'Ascq), Oguiso, Keiji (Tokyo), Patel, Aryaman (Essen), Paun, Mihai (Bayreuth), Phong, Duong H. (New York), Raissy, Jasmin (Talence), Ru, Min (Houston), Ruppenthal, Jean (Wuppertal), Samuelson Kalm, Håkan (Göteborg), Savale, Nikhil (Köln), Sektnan, Lars Martin (Göteborg), Sera, Martin (Kyoto), Shabtai, Ood (Ramat Aviv, Tel Aviv), Shen, Wei-Chuan (Köln), Stolovitch, Laurent (Nice), Tosatti, Valentino (Montréal), Vu, Duc Viet (Köln), Wulcan, Elizabeth (Göteborg), Zhu, Weixia (Wien)

11.09. - 17.09.2022 **Large Scale Stochastic Dynamics**

Organizers: Pietro Caputo, Roma
Fabio Toninelli, Wien
Bálint Tóth, Bristol

Abstract

The goal of this workshop was to explore the recent advances in the mathematical understanding of the macroscopic properties which emerge on large space-time scales from interacting microscopic particle systems. The talks addressed the following topics: randomness emerging from deterministic dynamics, hydrodynamic limits, Markov chain mixing times and cut-off phenomenon, superdiffusivity in out-of-equilibrium 2-dimensional systems.

Participants

Balázs, Márton (Bristol), Barashkov, Nikolay (Helsinki), Basu, Riddhipratim (Bangalore, Bengaluru), Bauerschmidt, Roland (Cambridge), Ben-Hamou, Anna (Paris), Bernardin, Cédric (Nice), Blondel, Oriane (Villeurbanne), Bodineau, Thierry (Palaiseau), Bolthausen, Erwin (Zürich), Busani, Ofer (Bonn), Cannizzaro, Giuseppe (Coventry), Caputo, Pietro (Roma), Caravenna, Francesco (Milano), Carvalho Goncalves, Ana Patrícia (Lisboa), Cosco, Clément (Rehovot), Dagallier, Benoit (Cambridge), De Gaspari, Damiano (Paris), de Lima Feltes, Guilherme (Bath), Faggionato, Alessandra (Roma), Ferrari, Patrik L. (Bonn), Geldhauser, Carina (Lund), Gheissari, Reza (Evanston), Gräfner, Lukas (Berlin), Hartarsky, Ivailo (Wien), Hartung, Lisa (Mainz), Haunschmid-Sibitz, Levi (Wien), Helmuth, Tyler (Durham), Jara, Milton (Rio de Janeiro), Kozma, Gady (Rehovot), Lacoin, Hubert (Rio de Janeiro), Landim, Claudio (Rio de Janeiro), Liu, Kuikui (Seattle), Liverani, Carlangelo (Roma), Nejjar, Peter (Bonn), Nota, Alessia (L'Aquila), Olla, Stefano (Paris), Ott, Sébastien (Fribourg), Pulvirenti, Mario (Roma), Quastel, Jeremy (Toronto), Quattropani, Matteo (Leiden), Ráth, Balázs (Budapest), Saffirio, Chiara (Basel), Salez, Justin (Paris), Sasada, Makiko (Tokyo), Sau, Federico (Klosterneuburg), Shapira, Assaf (Paris), Simon, Marielle (Villeneuve d'Ascq), Simonella, Sergio (Lyon), Spohn, Herbert (Garching bei München), Stauffer, Alexandre (Roma), Sun, Rongfeng (Singapore), Tetali, Prasad (Pittsburgh), Toninelli, Cristina (Paris), Toninelli, Fabio (Wien), Tóth, Bálint (Bristol), Zygouras, Nikolaos (Coventry)

18.09. - 24.09.2022 **Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean**

Organizers: Ulrich Achatz, Frankfurt
Oliver Bühler, New York
Chantal Staquet, Grenoble
William Young, La Jolla

Abstract
The atmosphere and oceans present an ongoing first-rate challenge to science and mathematics because they operate on an extremely broad ranges of scales, from molecular to planetary in length and from below seconds to millennia in time. This is the reason why climate simulations still suffer from leading-order uncertainties. Conceptual simplifications have enabled past progress in understanding the interactions of the basic dynamic constituents. But present-day research is stretching the validity of this framework. Motivated by recent advances in mathematical wave-vortex and wave-wave interaction theory, turbulence theory, and the study of internal wave dynamics as well as their numerical parametrization, the workshop gathered leading experts in these fields to foster a synthesis of new approaches and thereby a new level of understanding and numerical treatment of climate dynamics.

Participants
Achatz, Ulrich (Frankfurt am Main), Akylas, Triantaphyllos (Cambridge), Barkan, Roy (Ramat Aviv, Tel Aviv), Barnes, Ashley (Canberra), Bühler, Oliver (New York), Burchard, Hans (Warnemünde), Callies, Jörn (Pasadena), Cessi, Paola (La Jolla), Chew, Ray (Frankfurt am Main), Cotter, Colin (London), Deremble, Bruno (Saint-Martin-d'Hères), Dolaptchiev, Stamen (Frankfurt am Main), Dubrulle, Bérengère (Gif-sur-Yvette), Eden, Carsten (Hamburg), Ferrari, Raffaele (Cambridge), Freilich, Mara (La Jolla), Gerber, Edwin (New York), Grisouard, Nicolas (Toronto), Hassanzadeh, Pedram (Houston), Joubaud, Sylvain (Lyon), Kafiabad, Hossein (Edinburgh), Klein, Rupert (Berlin), Köhler, Laura (Hamburg), Le Dizes, Stephane (Marseille), Lelong, Pascale (Redmond), Llewellyn Smith, Stefan (La Jolla), Lorenz, Marvin (Rostock), Lott, Francois (Paris), Maas, Leo (Utrecht), Masur, Gökce Tuba (Frankfurt am Main), Menesguen, Claire (Plouzane), Nazarenko, Sergey (Nice), Perez, Nicolas (Lyon), Podglajen, Aurelien (Palaiseau), Polichtchouk, Inna (Reading), Rodda, Costanza (London), Shakespeare, Callum (Acton), Sheshadri, Aditi (Palo Alto), Shrira, Victor (Keele, Newcastle, Staffs), Smith, Shafer (New York), Sommeria, Joel (Grenoble), Spichtinger, Peter (Mainz), Staquet, Chantal (Grenoble), Stiperski, Ivana (Innsbruck), Sutherland, Bruce (Edmonton), Tabak, Esteban G. (New York), Thomas, Jim (Bangalore, Bengaluru), Vallis, Geoffrey K. (Exeter), Vanneste, Jacques (Edinburgh), Vercauteren, Nikki (Oslo), Voisin, Bruno (Grenoble), Völker, Georg Sebastian (Frankfurt am Main), Wagner, Gregory (Cambridge), Wang, Han (Edinburgh), Wingate, Beth (Exeter), Xie, Jin-Han (Beijing), Young, William R. (La Jolla)

25.09. - 01.10.2022

At the Interface between Semiclassical Analysis and Numerical Analysis of Wave Scattering Problems

Organizers: Simon Chandler-Wilde, Reading
Monique Dauge, Rennes
Euan Spence, Bath
Jared Wunsch, Evanston

Abstract

In this context of wave scattering, both semiclassical analysis and numerical analysis share the same goal – that of understanding the behaviour of the scattered wave – but these two fields operate largely in isolation, mainly because the tools and techniques of the two fields are largely disjoint. In recent years there have been promising examples of successful collaboration at the interface of semiclassical analysis and numerical analysis, to the mutual benefit of both fields. This workshop sought to capitalise on these successes by bringing together members of the semiclassical-analysis and numerical-analysis communities and catalysing activity at this interface.

Participants

Averseng, Martin (Zürich), Baskin, Dean (College Station), Beck, Thomas (Bronx), Bonnet-Bendhia, Anne-Sophie (Palaiseau), Burq, Nicolas (Orsay), Chaillat-Loseille, Stéphanie (Palaiseau), Chandler-Wilde, Simon N. (Reading), Chaumont-Frelet, Theophile (Sophia-Antipolis), Claeys, Xavier (Paris), Costabel, Martin (Rennes), Darbas, Marion (Villetaneuse), Dauge, Monique (Rennes), Dolean Maini, Victorita (Glasgow), Dyatlov, Semyon (Cambridge), Ecevit, Fatih (Bebek, Istanbul), Engquist, Björn (Austin), Epstein, Charles L. (New York), Fermanian-Kammerer, Clotilde (Créteil), Fliss, Sonia (Palaiseau), Galkowski, Jeffrey (London), Gander, Martin (Genève), Graham, Ivan G. (Bath), Halpern, Laurence (Villetaneuse), Hassell, Andrew (Canberra), Hillairet, Luc (Orléans), Hiptmair, Ralf (Zürich), Imbert-Gérard, Lise-Marie (Tucson), Ingremeau, Maxime (Nice), Ivanovici, Oana (Paris), Krupchyk, Katya (Irvine), Lafontaine, David (Toulouse), Marchand, Pierre (Palaiseau), Marzuola, Jeremy L. (Chapel Hill), Mazzucato, Anna (University Park), Melenk, Jens M. (Wien), Melrose, Richard B. (Cambridge), Moiola, Andrea (Pavia), Moitier, Zois (Karlsruhe), Nicaise, Serge (Valenciennes), Nonnenmacher, Stephane (Orsay), Obovu, Donnell (London), Rauch, Jeffrey (Ann Arbor), Raymond, Nicolas (Angers), Rota Nodari, Simona (Nice), Sauter, Stefan A. (Zürich), Schwab, Christoph (Zürich), Smyshlyaev, Valery P. (London), Spence, Euan (Bath), Strohmaier, Alexander (Leeds), Tacy, Melissa (Auckland), Urzúa-Torres, Carolina (Delft), Waters, Alden (Groningen), Wunsch, Jared (Evanston), Zepeda-Núñez, Leonardo (Madison), Zhang, Ruming (Karlsruhe), Zhao, Hongkai (Durham), Zou, Joey (Evanston)

30.10. - 05.11.2022 **Heat Kernels, Stochastic Processes and Functional Inequalities**

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

Abstract
The workshop provided a forum for recent progress on a wide array of topics at the nexus of Analysis (elliptic, subelliptic and parabolic differential equations), Geometry (Riemannian and sub-Riemannian geometries, metric measure spaces, geometric analysis and curvature), and Probability Theory (Brownian motion, Dirichlet spaces, stochastic calculus and random media). The workshop provides a unique opportunity to encourage and foster interactions between mathematicians who share some common interests but might use different research tools or work in different mathematical settings.

Participants
Abou-Salem, Mohamad (Bremen), Alonso Ruiz, Patricia (College Station), Andres, Sebastian (Manchester), Baudoin, Fabrice (Storrs), Berger, Noam (Garching bei München), Biskup, Marek (Los Angeles), Chen, Zhen-Qing (Seattle), Croydon, David (Kyoto), Dautenhahn, Emily (Ithaca), Dello Schiavo, Lorenzo (Klosterneuburg), Deuschel, Jean Dominique (Berlin), Erbar, Matthias (Bielefeld), Faggionato, Alessandra (Roma), Fathi, Max (Paris), Flaim, Marco (Bonn), Fleißner, Florentine (Garching bei München), Gantert, Nina (Garching bei München), Gordina, Masha (Storrs), Gwynne, Ewain (Chicago), Habermann, Karen (Coventry), Hajlasz, Piotr (Pittsburgh), Herry, Ronan (Rennes), Hotz, Thomas (Ilmenau), Huckemann, Stephan (Göttingen), Juillet, Nicolas (Mulhouse), Kajino, Naotaka (Kyoto), Kaßmann, Moritz (Bielefeld), Kigami, Jun (Kyoto), Kopfer, Eva (Bonn), Koskela, Pekka (Jyväskylä), Kumagai, Takashi (Tokyo), Li, Xue-Mei (London), Lin, Jessica (Montréal), Maas, Jan (Klosterneuburg), Mathieu, Pierre (Marseille), Melcher, Tai Alexis (Charlottesville), Mémoli, Facundo (Columbus), Milman, Emanuel (Haifa), Moumeni, Noridne (Marseille), Murugan, Mathav (Vancouver), Needham, Tom (Tallahassee), Peltola, Eveliina (Bonn), Rigoni, Chiara (Wien), Saloff-Coste, Laurent (Ithaca), Savaré, Giuseppe (Milano), Shanmugalingam, Nageswari (Cincinnati), Slowik, Martin (Mannheim), Sousi, Perla (Cambridge), Sturm, Theo (Bonn), Thalmaier, Anton (Esch-sur-Alzette), Tyson, Jeremy (Urbana), Wang, Jian (Fuzhou), Wang, Yilin (Bures-sur-Yvette), Weidner, Marvin (Barcelona), Winter, Anita (Essen)

06.11. - 12.11.2022 **Analytic Number Theory**

Organizers: Kaisa Matomäki, Turku
Kannan Soundararajan, Stanford
Robert C. Vaughan, State College
Trevor D. Wooley, West Lafayette

Abstract

Analytic number theory is a subject central to modern mathematics. There are many important unsolved problems which have stimulated a large amount of activity by many talented researchers. At least two of the Millennium Problems can be considered to be in this area. Moreover in recent years there has been very substantial progress on a number of these questions. The workshop was well attended with 53 participants from a broad geographic spectrum, all either distinguished and leading workers in the field or very promising younger researchers, and notable on this occasion for the diversity of this participant group

Participants

Aistleitner, Christoph (Graz), Bettin, Sandro (Genova), Bhargava, Manjul (Princeton), Blomer, Valentin (Bonn), Bloom, Thomas (Oxford), Brandes, Julia (Göteborg), Browning, Timothy D. (Klosterneuburg), Brüdern, Jörg (Göttingen), Chandee, Vorrapan (Manhattan), Chow, Sam (Coventry), Conrey, Brian (San Jose), Dartyge, Cecile (Vandoeuvre-lès-Nancy), De La Bretèche, Régis (Paris), Devin, Lucile (Calais), Dietmann, Rainer (Egham), Florea, Alexandra (Irvine), Fouvry, Etienne (Orsay), Green, Ben J. (Oxford), Gun, Sanoli (Tamil Nadu), Guo, Shaoming (Madison), Harper, Adam J. (Coventry), Heath-Brown, Roger (Oxford), Helfgott, Harald A. (Paris), Hochfilzer, Leonhard (Göttingen), Kowalski, Emmanuel (Zürich), Kuperberg, Vivian (Ramat Aviv, Tel Aviv), Lalin, Matilde N. (Montréal), Lester, Stephen (London), Li, Junxian (Bonn), Lichtman, Jared Duker (Oxford), Mangerel, Alexander (Durham), Matomäki, Kaisa (University of Turku), Maynard, James A. (Oxford), Merikoski, Jori (Oxford), Montgomery, Hugh L. (Ann Arbor), Myerson, Simon L. R. (Coventry), Peluse, Sarah (Princeton), Pliego Garcia, Javier (Stockholm), Pratt, Kyle (Oxford), Rodgers, Brad (Kingston), Salberger, Per (Göteborg), Sawin, Will (New York), Schindler, Damaris (Göttingen), Shao, Fernando Xuancheng (Lexington), Smith, Alexander (Stanford), Soundararajan, Kannan (Stanford), Suriajaya, Ade Irma (Fukuoka), Swaenepoel, Cathy (Paris), Teräväinen, Joni (University of Turku), Thompson, Lola (Utrecht), Vaughan, Robert C. (State College), Wooley, Trevor D. (West Lafayette), Zhao, Lilu (Jinan, Shandong)

13.11. - 19.11.2022 **Mathematical Advances in Geophysical Fluid Dynamics**

Organizers: Yoshikazu Giga, Tokyo
Matthias Hieber, Darmstadt
Peter Korn, Hamburg
Edriss S. Titi, Cambridge/College Station/Rehovot

Abstract
The workshop "Mathematical Advances in Geophysical Fluid Dynamics" addressed recent advances in modeling, analytical, computational and stochastical studies of geophysical flows. Of particular interest were contributions concerning modeling and analysis of sea ice models, well-posedness results for the primitive equations and boundary layers, stratified flows and models for moist atmospheric dynamics including phase transitions.

Participants
Agresti, Antonio (Klosterneuburg), Bardos, Claude (Paris), Binz, Tim (Darmstadt), Boutros, Daniel (Cambridge), Brandt, Felix (Darmstadt), Brenier, Yann (Paris), Cao, Chongsheng (Miami), Dalibard, Anne-Laure (Paris), Danilov, Sergey (Bremerhaven), Disser, Karoline (Kassel), Feireisl, Eduard (Praha), Furukawa, Ken (Kobe), Gérard-Varet, David (Paris), Ghattas, Omar (Austin), Giga, Yoshikazu (Tokyo), Golden, Kenneth M. (Salt Lake City), Golse, Francois (Palaiseau), Griffies, Stephen (Princeton), Guo, Yanqiu (Miami), Haynes, Peter H. (Cambridge), Hieber, Matthias (Darmstadt), Hussein, Amru (Kaiserslautern), Huysmans, Lucas (Cambridge), Khouider, Boualem (Victoria), Korn, Peter (Hamburg), Kozono, Hideo (Tokyo), Kukavica, Igor (Los Angeles), Li, Jinkai (Guangzhou), Lin, Quyuan (Santa Barbara), Liu, Xin (College Station), Lopes Filho, Milton (Rio de Janeiro), Lukáčová-Medvidová, Mária (Mainz), Mazzucato, Anna (University Park), Mehlmann, Carolin (Magdeburg), Modena, Stefano (L'Aquila), Monniaux, Sylvie (Marseille), Nussenzveig Lopes, Helena J. (Rio de Janeiro), Remond-Tiedrez, Antoine (Cambridge), Rodrigues Lapolli, Fabricio (São Paulo), Roy, Arnab (Bilbao, Bizkaia), Saal, Jürgen (Düsseldorf), Shimizu, Senjo (Kyoto), Smolarkiewicz, Piotr (Boulder), Stadler, Georg (New York), Stechmann, Samuel N. (Madison), Székelyhidi Jr., László (Leipzig), Takada, Ryo (Tokyo), Titi, Edriss S. (Cambridge), Tolksdorf, Patrick (Mainz), Tuffaha, Amjad (Sharjah), Wingate, Beth (Exeter), Yamada, Michio (Kyoto)

04.12. - 10.12.2022 **Algebraic Structures in Statistical Methodology**

Organizers: Mathias Drton, München
Thomas Kahle, Magdeburg
Seth Sullivant, Raleigh
Caroline Uhler, Zürich/Cambridge MA

Abstract

Algebraic structures arise naturally in a broad variety of statistical problems, and numerous fruitful connections have been made between algebra and discrete mathematics and research on statistical methodology. The workshop took up this theme with a particular focus on algebraic approaches to graphical models, causality, axiomatic systems for independence and non-parametric models. The workshop was a key event for the community of algebraic statistics. We are looking forward to much new research and many new collaborations emerging from the workshop.

Participants

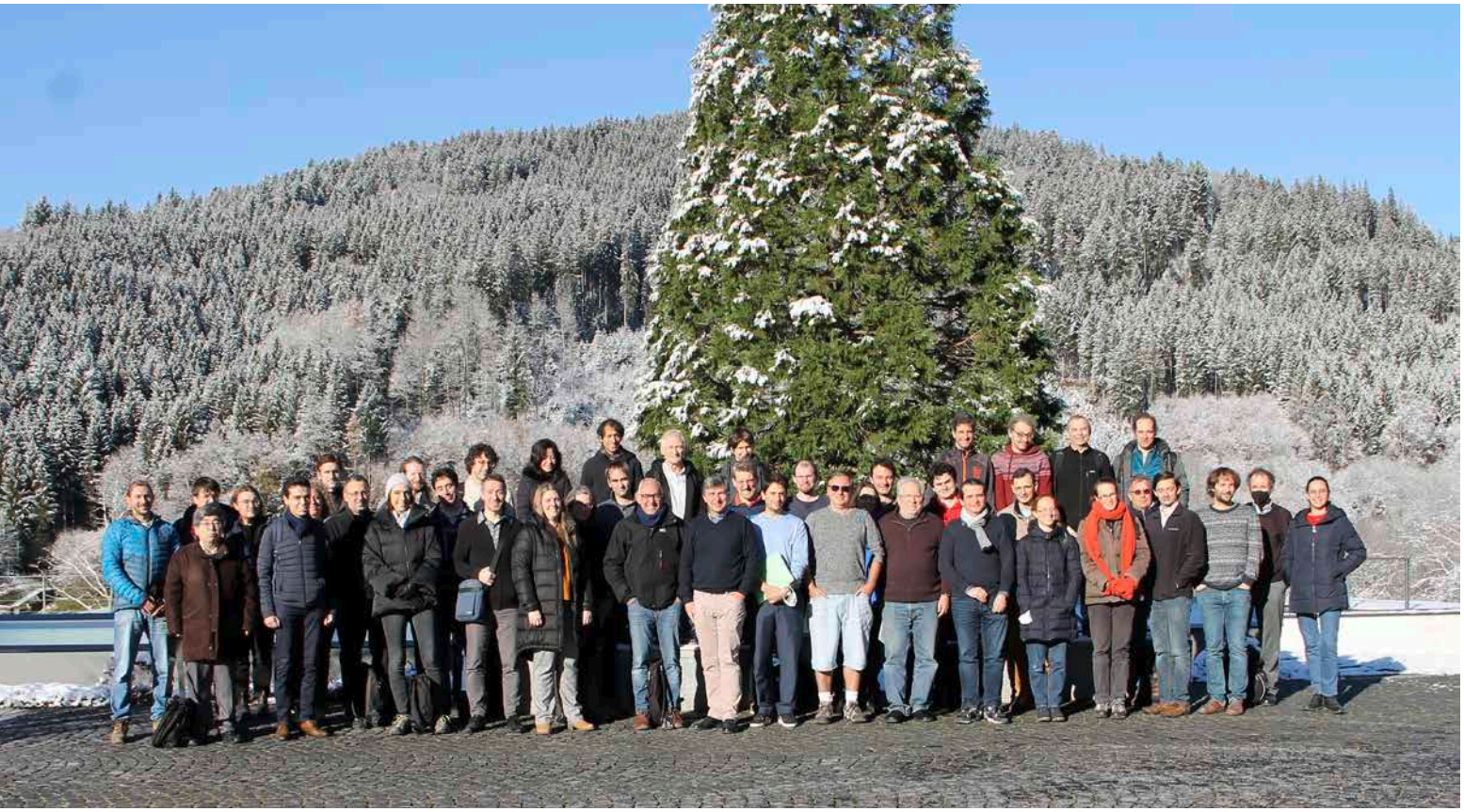
Améndola Cerón, Carlos Enrique (Berlin), Ardiyansyah, Muhammad (Aalto), Boege, Tobias (Aalto), Drton, Mathias (Garching bei München), Duarte Gelvez, Eliana M. (Porto), Evans, Robin (Oxford), Grosdos, Alexandros (Garching bei München), Gross, Elizabeth (Honolulu), Hollering, Ben (Raleigh), Homs Pons, Roser (Bellaterra, Barcelona), Hosten, Serkan (San Francisco), Kahle, Thomas (Magdeburg), Kubjas, Kaie (Aalto), Lauritzen, Steffen (København), Misra, Pratik (Stockholm), Portakal, Irem (Garching bei München), Robeva, Elina (Vancouver), Rodriguez, Jose Israel (Madison), Seigal, Anna (Cambridge), Solus, Liam (Stockholm), Studený, Milan (Praha), Sullivant, Seth (Raleigh), Uhler, Caroline (Cambridge), Zwiernik, Piotr (Toronto)

04.12. - 10.12.2022 **History of Mathematics through Collaboration: Toward a Composite Portrait of Oswald Veblen**

Organizers: Sloan Despeaux, Cullowhee
Della Dumbaugh, Richmond
Jemma Lorenat, Claremont

Abstract
Oswald Veblen played a pivotal role in the history of American mathematics in the twentieth century. His life, however, remains largely unstudied. This conference was designed to redress this issue by exploring Oswald Veblen and his contributions to the history of American and international mathematics in an interactive workshop that used the Veblen Papers from the US Library of Congress as a foundational and shared resource. With this frame, the conference raised queries and discussed issues related to Veblen, his mathematical contributions, and his collaborative initiatives, including his critical work aiding refugee mathematicians in WWII that helped establish long standing programs at American institutions that continue to advance mathematics at the highest level. The workshop echoed Veblen's collaborative focus and brought together historians of mathematics and mathematicians to work alongside one another during the conference. This content and collaborative approach combined to advance our understanding of Veblen's collaborations and the history of twentieth-century mathematics more broadly.

Participants
Aubin, David (Paris), Braun, Benjamin (Lexington), Carvajalino, Juan (Saint-Denis), Despeaux, Sloan (Cullowhee), Dumbaugh, Della (Richmond), Duran, Samson (Orsay), Durnova, Helena (Brno), Ehrhardt, Caroline (Saint-Denis), Haffner, Emmylou (Paris), Hollings, Christopher (Oxford), Kennedy, Stephen (Northfield), Kent, Deborah A. (St. Andrews), Lorenat, Jemma (Claremont), Luciano, Erika (Torino), Michel, Nicolas (Wuppertal), Sarikaya, Deniz (Brussels), Turner, Laura (West Long Branch)



11.12. - 17.12.2022 **Enumerative Combinatorics**

Organizers: Mireille Bousquet-Mélou, Talence
Guillaume Chapuy, Paris
Michael Drmota, Wien
Sergi Elizalde, Hanover

Abstract

Enumerative Combinatorics focuses on the exact and asymptotic counting of combinatorial objects. It has fruitful connections to several disciplines, including statistical physics, algebraic combinatorics, probability theory, graph theory and computer science. This workshop brought together experts from all these various fields with the goal of promoting cooperation and interaction among researchers with largely varying backgrounds. It was the third workshop on this topic (the first two editions dating back to 2014 and 2018) and this time the main focus was on interactions with algebraic combinatorics.

Participants

Albenque, Marie (Palaiseau), Albion, Seamus (Wien), Ben Dali, Houcine (Paris), Bernardi, Olivier (Waltham), Bostan, Alin (Palaiseau), Bousquet-Mélou, Mireille (Talence), Bouttier, Jérémie (Gif-sur-Yvette), Bouvel, Mathilde (Vandoeuvre-lès-Nancy), Budd, Timothy (Nijmegen), Chapuy, Guillaume (Paris), Corteel, Sylvie (Paris), De Ambroggio, Umberto (München), Di Francesco, Philippe (Urbana), Dolega, Maciej (Kraków), Dousse, Jehanne (Villeurbanne), Douvropoulos, Theo (Amherst), Drmota, Michael (Wien), Elizalde, Sergi (Hanover), Elvey Price, Andrew (Tours), Fang, Wenjie (Marne-la-Vallée), Féray, Valentin (Vandoeuvre-lès-Nancy), Fischer, Ilse (Wien), Fusy, Éric (Marne-la-Vallée), Gao, Jason Z. (Ottawa), Guttmann, Tony (Melbourne), Hardouin, Charlotte (Toulouse), Josuat-Vergès, Matthieu (Paris), Konvalinka, Matjaz (Ljubljana), Krattenthaler, Christian (Wien), Linusson, Svante (Stockholm), Louf, Baptiste (Uppsala), McKay, Brendan (Canberra), Miermont, Grégory (Lyon), Mishna, Marni (Burnaby), Morales, Alejandro (Amherst), Nadeau, Philippe (Villeurbanne), Noy, Marc (Barcelona), Okada, Soichi (Nagoya), Pak, Igor (Los Angeles), Panagiotou, Konstantinos (München), Panova, Greta C. (Los Angeles), Pantone, Jay (Milwaukee), Raschel, Kilian (Angers), Sagan, Bruce E. (East Lansing), Salvy, Bruno (Lyon), Schaeffer, Gilles (Palaiseau), Singer, Michael F. (Carrboro), Steingrimsson, Einar (Glasgow), Striker, Jessica (Fargo), Williams, Lauren K. (Cambridge), Williams, Nathan (Richardson), Winkler, Peter M. (Hanover), Yurkevich, Sergey (Wien)

2.4. Miniworkshops

Miniworkshop 2207a

13.02. - 19.02.2022 **Interpolation, Approximation, and Algebra**

Organizers: Carl de Boor, Madison
Tomas Sauer, Passau
Hal Schenck, Auburn
Tanya Sorokina, Towson

Abstract

This workshop involved two concepts of geometric modeling: multi-variate data interpolation by polynomials, and the study of generalized bary\-centric coordinates. These topics are connected to a wide range of of applications, from computer aided design (CAD) systems for designing airplanes and automobiles to animation in movies to problems in numerical analysis and partial differential equations. Traditionally these topics were studied mostly from an analytic standpoint, but recently advanced algebraic tools have come into the picture. The purpose of the Mini-Workshop was to bring together a diverse group of researchers with different areas of expertise, drawing from both the approximation theory and algebraic geometry communities, and to explore the connections between the two areas in greater detail.

Participants

Carnicer, Jesus (Zaragoza), de Boor, Carl (Eastsound), Fink, Thomas (Passau), Floater, Michael S. (Oslo), Garcia Puente, Luis D. (Colorado Springs), Hakopian, Hakop A. (Yerevan), Hubert, Evelyne (Sophia-Antipolis), Kohn, Kathlén (Stockholm), Ranestad, Kristian (Oslo), Sauer, Tomas (Passau), Schafer, Scott (College Station), Schenck, Henry K. (Auburn), Schumaker, Larry L. (Nashville), Seceleanu, Alexandra (Lincoln), Shekhtman, Boris (Tampa), Sorokina, Tatyana (Towson), Sottile, Frank (College Station), Villamizar, Nelly Y. (Swansea), Xu, Yuan (Eugene)

13.02. - 19.02.2022 **Descriptive Combinatorics, LOCAL Algorithms and Random Processes**

Organizers: Jan Grebik, Coventry
Oleg Pikhurko, Coventry
Anush Tserunyan, Montréal

Abstract
The aim of this Mini-Workshop was to discover and deepen connections between the fields of descriptive combinatorics, distributed computing and random processes. The common link is played by the so-called local coloring problems on graphs, where the validity of solution can be checked locally, and the common interest can be phrased as the following central question: Is it possible to produce a solution to a given local problem efficiently? While all three areas possess a solid background that was achieved by decades of intense research, a systematic study of formal connections between them is a recent emerging phenomenon. This approach has already proved to be very fruitful: several open questions in each of the fields were solved by means and techniques of the other two. The purpose of this meeting was to bring together researchers in all three fields in order to explore these exciting connections.

Participants
Bernshteyn, Anton (Atlanta), Bowen, Matthew (Montréal), Brandt, Sebastian (Saarbrücken), Ciesla, Tomasz (Lancaster), Ghaffari, Mohsen (Zürich), Grabowski, Łukasz (Lancaster), Grebik, Jan (Coventry), Holroyd, Alexander E. (Bristol), Hrušková, Aranka (Budapest), Hutchcroft, Thomas (Pasadena), Kechris, Alexander (Pasadena), Konecny, Matej (Praha), Marks, Andrew (Los Angeles), Pete, Gabor (Budapest), Pikhurko, Oleg (Coventry), Rozhon, Vaclav (Zürich), Sabok, Marcin (Montréal), Spinka, Yinon (Vancouver), Terlov, Grigory (Urbana-Champaign), Thornton, Riley (Los Angeles), Tserunyan, Anush (Montréal), Vidnyanszky, Zoltan (Pasadena), Zomback, Jenna (Urbana)

13.02. - 19.02.2022 **Regularization by Noise: Theoretical Foundations, Numerical Methods and Applications**

Organizers: Oleg Butkovsky, Berlin
Ana Djurdjevac, Berlin
Máté Gerencsér, Wien

Abstract
The regularizing effects of noisy perturbations of differential equations is a central subject of stochastic analysis. Recent breakthroughs initiated a new wave of interest, particularly concerning non-Markovian, infinite dimensional, and rough-stochastic/Young-stochastic hybrid systems. The Mini-Workshop aimed to build on these developments by bringing together young researchers in the field. Particular emphasis was given to the connection to numerical stochastic analysis, aiming to put the regularizing effects of the noise into quantitative numeric use.

Participants
Bayer, Christian (Berlin), Butkovsky, Oleg (Berlin), Cox, Sonja G. (Amsterdam), Dareiotis, Konstantinos (Leeds), Djurdjevac, Ana (Berlin), Eisenmann, Monika (Lund), Elad Altman, Henri (Berlin), Galeati, Lucio (Bonn), Gerencsér, Máté (Wien), Gerolla, Luca (London), Kremp, Helena Katharina (Berlin), Kruse, Raphael (Halle / Saale), Lange, Theresa (Bielefeld), Lê, Khoa (Berlin), Ling, Chengcheng (Berlin), Menozzi, Stephane (Évry), Perkowski, Nicolas (Berlin), Rosati, Tommaso C. (London), Szölgyenyi, Michaela (Klagenfurt), Tapia, Nikolas (Berlin), Yaroslavtseva, Larisa (Passau)

20.03. - 26.03.2022 **Nonlocality in Analysis, Probability and Statistics**

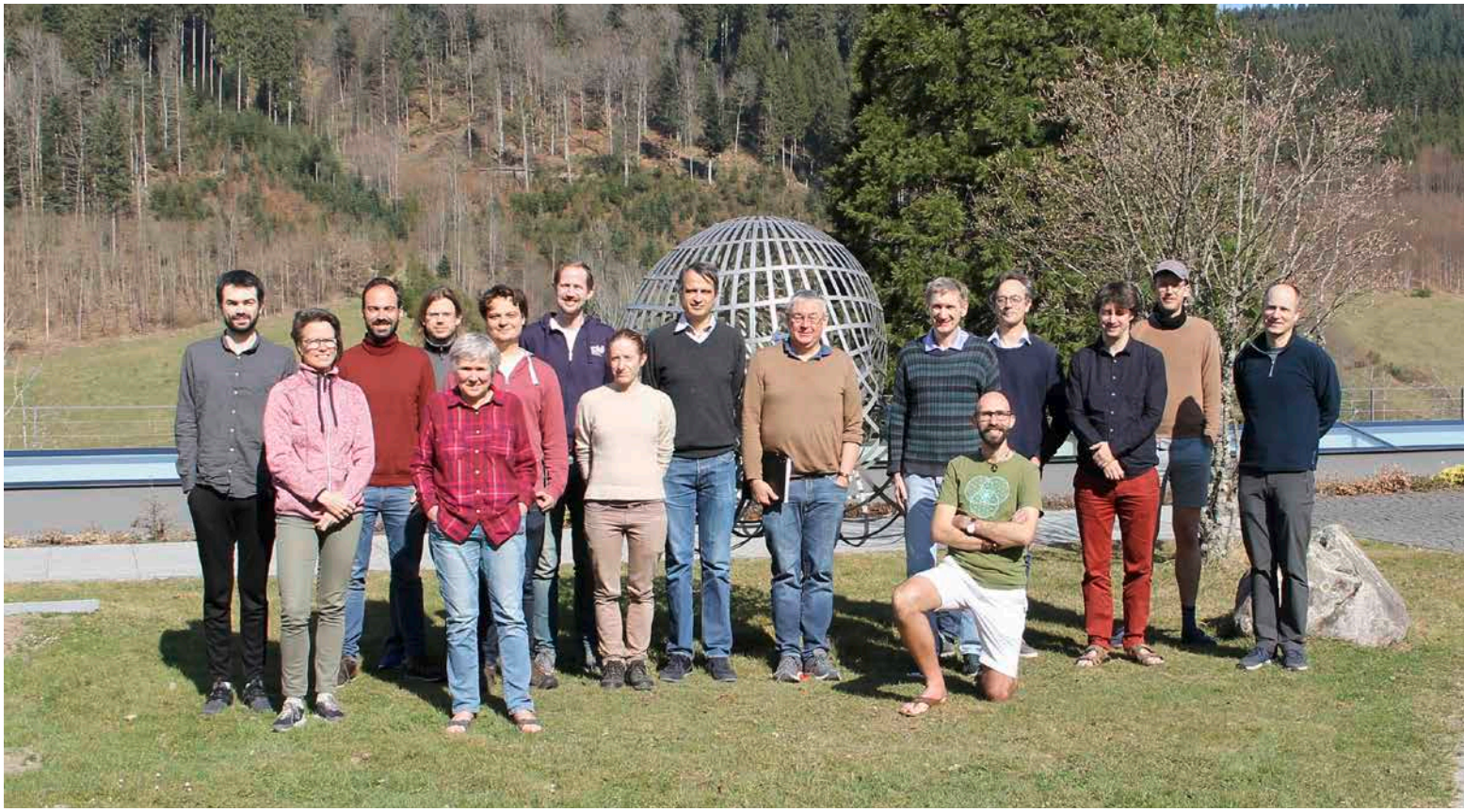
Organizers: Krzystzof Bogdan, Wroclaw
Arturo Kohatsu-Higa, Kyoto
Xavier Ros-Oton, Barcelona
René Schilling, Dresden

Abstract

The central theme of the workshop were nonlocal operators which appear in various branches of mathematics (PDEs, fractional calculus, stochastic processes, statistics). Although the basic concepts are similar, both language and methods differ depending on one's own community. The aim of the workshop was to bring together leading researchers from these disciplines, in order to alert the different communities about the problems, methods, and progress achieved separately, and to bridge the gap caused by different background and different mathematical terminology.

Participants

Abatangelo, Nicola (Bologna), Abels, Helmut (Regensburg), Berger, David (Dresden), Bogdan, Krzysztof (Wrocław), Cozzi, Matteo (Milano), Fernández-Real Girona, Xavier (Lausanne), Garofalo, Nicola (Padova), Grubb, Gerd (København), Hamadi, Mustafa (Dresden), Haroske, Dorothee (Jena), Jacob, Niels (Swansea), Kaßmann, Moritz (Bielefeld), Klimsiak, Tomasz (Toruń), Kohatsu-Higa, Arturo (Shiga), Kukuljan, Teo (Barcelona), Kulyk, Oleksii (Wrocław), Lenczewska, Julia (Wrocław), Minecki, Jakub (Wrocław), Nowak, Simon (Bielefeld), Pietruska-Paluba, Katarzyna (Warszawa), Priola, Enrico (Pavia), Roncal, Luz (Bilbao, Bizkaia), Ros-Oton, Xavier (Barcelona), Rüland, Angkana (Heidelberg), Schilling, René (Dresden), Servadei, Raffaela (Urbino), Shargorodsky, Eugene (London), Szczypkowski, Karol (Wrocław), Torres-Latorre, Damià (Barcelona), Weidner, Marvin (Bielefeld)



20.03. - 26.03.2022 **Recent Developments in Representation Theory and Mathematical Physics**

Organizers: Tudor Dimofte, Davis/Edinburgh
Thorsten Heidersdorf, Bonn
Catharina Stroppel, Bonn

Abstract
The aim of this Mini-Workshop was to bring together mathematical physicists and mathematicians with research interests close to specific areas of representation theory. The meeting provided a format for intense discussions and interactions. The Mini-Workshop was attended by 16 in-person participants and another 6 online participants. One of the main themes discussed was the representation theory of supergroups and superalgebras, as it appears in mathematics and mathematical physics.

Participants
Aganagic, Mina (Berkeley), Brown, Jennifer (New Haven), Creutzig, Thomas (Edmonton), Dimofte, Tudor Dan (Edinburgh), Feigin, Boris (Moscow), Felder, Giovanni (Zürich), Gaiotto, Davide (Waterloo), Heidersdorf, Thorsten (Bonn), Jockers, Hans (Mainz), Klemm, Albrecht (Bonn), Mukhin, Evgeny (Indianapolis), Putrov, Pavel (Trieste), Reshetikhin, Nicolai (Beijing), Reutter, David (Bonn), Rozansky, Lev (Chapel Hill), Serganova, Vera V. (Berkeley), Stroppel, Catharina (Bonn), Teschner, Jörg (Hamburg), Vlaar, Bart (Bonn), Wehrhan, Till (Bonn), Williams, Brian (Edinburgh), Woike, Lukas (København)

02.10. - 08.10.2022 **Zero-Range and Point-Like Singular Perturbations: For a Spillover to Analysis, PDE and Differential Geometry**

Organizers: Vladimir Georgiev, Pisa
Alessandro Michelangeli, Bonn/Trieste

Abstract
The field of contact interactions and perturbations of differential operators supported on subsets with non-trivial co-dimension is an increasingly active mainstream of mathematical physics (in particular, operator and spectral theory and quantum mechanics), with intimately related applications and mathematical challenges in partial differential equations, and neighbouring sectors of analysis, PDEs, and differential geometry. This Mini-Workshop fostered intense and prolific discussions on recent advances and trends in the field.

Participants
Adami, Riccardo (Torino), Albeverio, Sergio (Bonn), Barbera, Daniele (Pisa), Bellazzini, Jacopo (Pisa), Beschastnyi, Ivan (Aveiro), Boni, Filippo (Napoli), Boscain, Ugo (Paris), Cortopassi, Tommaso (Pisa), Cossetti, Lucrezia (Karlsruhe), Cuccagna, Scipio (Trieste), Cunden, Fabio (Bari), Erceg, Marko (Zagreb), Fanelli, Luca (Bilbao, Bizkaia), Franceschi, Valentina (Padova), Fukaya, Noriyoshi (Tokyo), Gallone, Matteo (Trieste), Georgiev, Vladimir S. (Pisa), Ikeda, Masahiro (Saitama), Lee, Jinyeop (München), Ligabò, Marilena (Bari), Lucente, Sandra (Bari), Michelangeli, Alessandro (Bonn), Noja, Diego (Milano), Ozawa, Tohru (Tokyo), Pozzoli, Eugenio (Dijon), Rastrelli, Mario (Pisa), Rizzi, Luca (Trieste), Scandone, Raffaele (L'Aquila), Tzvetkov, Nikolay (Cergy-Pontoise), Visciglia, Nicola (Pisa), Vojnović, Ivana (Novi Sad), Wirth, Jens (Stuttgart), Yajima, Kenji (Tokyo)

02.10. - 08.10.2022
Organizers:

Quantization of Complex Symplectic Varieties
John Alexander Cruz Morales, Bogotá
Olivia M. Dumitrescu, Chapel Hill
Motohico Mulase, Bonn/Davis
Katrin Wendland, Dublin

Abstract
The Mini-Workshop featured two main series of lectures: "Functoriality in non-abelian Hodge theory" by Tony Pantev, and "Quantization of the Hitchin system and the analytic Langlands program" by Jörg Teschner. In addition, four senior mathematicians and physicists gave two talks each on their recent mysterious discoveries related to the theme of the workshop. Three junior mathematicians also gave a talk based on their fresh results. All talks by mathematicians and physicists were coordinated to form a common ground of understanding. The smallness of the size of workshop promoted deeper discussions and helped to create friendly and inclusive atmosphere.

Participants
Adams, Ashleigh (Davis), Alim, Murad (Hamburg), Baraglia, David (Adelaide), Bimmermann, Johanna (Heidelberg), Brown, Jennifer (New Haven), Cruz Morales, John Alexander (Bogotá), Dinh, Duong (Hamburg), Dumitrescu, Olivia M. (Chapel Hill), Erickson, Jonathan (Davis), Guéré, Jérémy (Saint-Martin-d'Hères), Lee, Sukjoo (Edinburgh), Mulase, Motohico (Bonn), Pantev, Tony (Philadelphia), Peón-Nieto, Ana (Birmingham), Rudenko, Dmytro (Bremen), Sertöz, Emre Can (Hannover), Sulkowski, Piotr (Warszawa), Teschner, Jörg (Hamburg), Wendland, Katrin (Dublin)

02.10. - 08.10.2022 **Mathematical Foundations of Robust and Generalizable Learning**

Organizers: Johannes Lederer, Bochum
Po-Ling Loh, Cambridge
Yuting Wei, Philadelphia
Fanny Yang, Zürich

Abstract
Statistical learning and machine learning have achieved remarkable empirical success recently in science and engineering applications, including computer vision, neural language processing, game playing, robotics control, and even protein folding. Despite their enormous success in practice, these learning methods often differ significantly from classical statistical learning, and their generalizability and robustness are poorly understood. This workshop identified key challenges, and it discussed potential solutions. Bringing together a diverse group of researchers, the workshop established different views on the topic based on notions from statistics, probability theory, and optimization.

Participants
Balakrishnan, Sivaraman (Pittsburgh), Chen, Yuansi (Durham), Chen, Yuxin (Philadelphia), Donhauser, Konstantin (Zürich), Golestaneh, Pegah (Bochum), Heckel, Reinhard (München), Hsu, Daniel (New York), Jog, Varun (Cambridge), Kirch, Claudia (Magdeburg), Lecué, Guillaume (Palaiseau), Lederer, Johannes (Bochum), Loh, Po-Ling (Cambridge), Mücke, Nicole (Braunschweig), Reiß, Markus (Berlin), Rinaldo, Alessandro (Pittsburgh), Rohde, Angelika (Freiburg i. Br.), Telgarsky, Matus (Urbana), Tibshirani, Ryan (Berkeley), Wei, Yuting (Philadelphia), Yang, Fanny (Zürich)

27.11. - 03.12.2022 **Topological and Differential Expansions of o-minimal Structures**

Organizers: Paola D'Aquino, Caserta
Pantelis Eleftheriou, Konstanz/Leeds
Omar León Sánchez, Manchester
Francoise Point, Mons

Abstract
The workshop brought together researchers with expertise in areas of mathematics where model theory has had interesting applications. The areas of expertise spanned from expansions of o-minimal structures preserving tame geometric properties to expansions of specified fields by classical operators that preserve neo-stability properties. There were presentations and discussions on recent developments in definable groups and decompositions in relatively tame setups, the interplay of different notions of dimension and closure operators, and applications of the model theory of differential fields to diophantine geometry.

Participants
Berenstein, Alexander (Bogotá), Block Gorman, Alexi (Hamilton), Chatzidakis, Zoé (Paris), D'Aquino, Paola (Caserta), Eleftheriou, Pantelis (Leeds), Fornasiero, Antongiulio (Firenze), Freitag, James (Chicago), Gallinaro, Francesco (Freiburg i. Br.), Hieronymi, Philipp (Bonn), Kaplan, Elliot (Hamilton), Kaplan, Itay (Jerusalem), Kirby, Jonathan (Norwich), Léon Sánchez, Omar (Manchester), Point, Francoise (Mons), Steinhorn, Charles (Poughkeepsie), Vicaria, Mariana (Los Angeles)

27.11. - 03.12.2022 **A Geometric Fairytale full of Spectral Gaps and Random Fruit**

Organizers: Joachim Kerner, Hagen
Matthias Täufer, Hagen
Pavlo Yatsyna, Espoo

Abstract
In many situations, most prominently in quantum mechanics, it is important to understand well the eigenvalues and associated eigenfunctions of certain self-adjoint differential operators. The goal of this workshop was to study the strong link between spectral properties of such operators and the underlying geometry which might be randomly generated. By combining ideas and methods from spectral geometry and probability theory, we hope to stimulate new research including important topics such as Bose-Einstein condensation in random environments.

Participants
Ashbaugh, Mark S. (Columbia), Becker, Simon (New York), Benguria, Rafael (Santiago), Boccato, Chiara (Milano), Brasco, Lorenzo (Ferrara), Brennecke, Christian (Bonn), Calka, Pierre (Saint-Étienne-du-Rouvray), Cenatiempo, Serena (L'Aquila), Clutterbuck, Julie (Clayton), Dello Schiavo, Lorenzo (Klosterneuburg), Kerner, Joachim (Hagen), Nicolussi, Noema (Potsdam), Pechmann, Maximilian (Knoxville), Polterovich, Iosif (Montréal), Spitzer, Wolfgang (Hagen), Sznitman, Alain-Sol (Zürich), Taeufer, Matthias (Hagen), Yatsyna, Pavlo (Espoo)

27.11. - 03.12.2022 **Subvarieties in Projective Spaces and Their Projections**

Organizers: Thomas Bauer, Marburg
Giuseppe Favacchio, Palermo
Juan Migliore, Notre Dame
Justyna Szpond, Warszawa

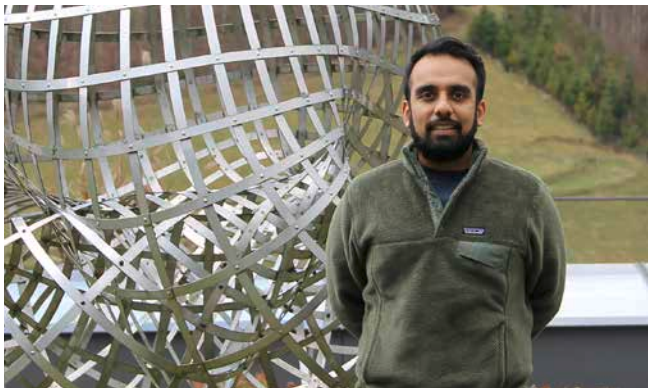
Abstract
The major goals of this workshop are to lay paths for a systematic study of geproci (and related, e.g., projecting to almost complete intersections or full intersections) sets of points in projective spaces, study algebraic properties of their ideals (e.g. in the spirit of the Cayley-Bacharach properties), and to identify the most promising new directions for study. The meeting was attended by 14 participants in person and 2 online participants from Europe and North America. There was a diversity in experience level ranging from a PhD student to established, internationally recognized professors.

Participants
Bauer, Thomas (Marburg), Chiantini, Luca (Siena), Denham, Graham (London), Favacchio, Giuseppe (Palermo), Galuppi, Francesco (Warszawa), Guardo, Elena (Catania), Harbourne, Brian (Lincoln), Huizenga, Jack (University Park), Malara, Grzegorz (Kraków), Migliore, Juan C. (Notre Dame), Seceleanu, Alexandra (Lincoln), Szemberg, Tomasz (Kraków), Szpond, Justyna (Warszawa), Tutaj-Gasińska, Halszka (Kraków), Van Tuyl, Adam (Hamilton), Zieba, Maciej (Kraków)

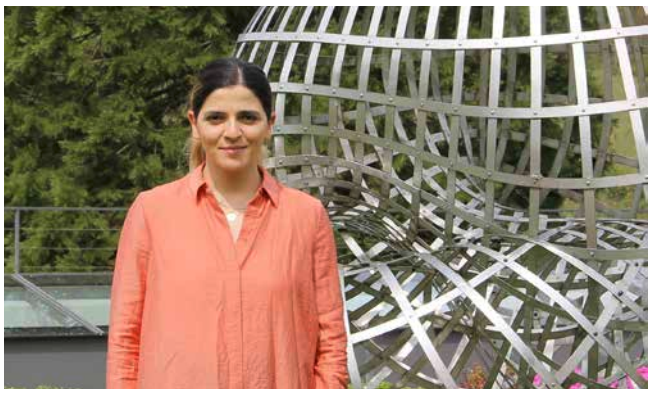
2.5. Simons Visiting Professors

Die folgenden Forscherinnen und Forscher kombinierten einen Aufenthalt in Oberwolfach mit einem Aufenthalt an einer europäischen Universität, unterstützt durch die Simons Foundation.

Bojan Mohar, Burnaby
Workshop 2201: Graph Theory
Hosts: Mihyun Kang, Graz
Sergio Cabello, Ljubljana



Bhargav Narayanan, New Brunswick
Workshop 2201: Graph Theory
Host: Juhan Aru, Lausanne



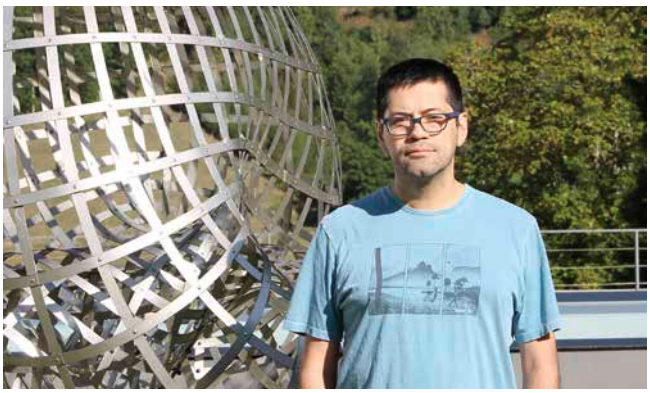
Liara Yepremyan, Atlanta
Workshop 2217: Combinatorics, Probability and Computing
Host: Shoham Letzter, London

2.5. Simons Visiting Professors

The following researchers combined their stay in Oberwolfach with a research visit to a European University, supported by the Simons Foundation.

Robert Muth, Pittsburgh
Workshop 2235: Character Theory and Categorification
Host: Christopher Bowman-Scargill, York

Chin-Yu Hsiao, Taipei
Workshop 2236: Complex Geometry and Dynamical Systems
Host: George Marinescu, Köln



Milton Jara, Rio de Janeiro
Workshop 2237: Large Scale Stochastic Dynamics
Host: Ana Patrícia Carvalho Gonzalves

Björn Engquist, Austin
Workshop 2239: At the Interface between Semiclassical Analysis and Numerical Analysis of Wave Scattering Problems
Host: Ralf Hiptmair, Zürich

Elizabeth Gross, Honululu
Workshop 2249a: Algebraic Structures in Statistical Methodology
Host: Mathias Drton, München

Serkan Hosten, San Francisco
Workshop 2249a: Algebraic Structures in Statistical Methodology
Host: Thomas Kahle, Magdeburg

2.6. Arbeitsgemeinschaften

Arbeitsgemeinschaft 2214

03.04. - 09.04.2022 **Geometric Representation Theory**

Organizers: Daniel Juteau, Amiens
Simon Riche, Clermont-Ferrand
Wolfgang Soergel, Freiburg
Geordie Williamson, Sydney

Abstract

Our understanding of algebraic representations of reductive algebraic groups in positive characteristic has seen big advances in the last years and has been largely transformed into the geometric theory of studying parity sheaves on affine Grassmannians and affine flag varieties or, equivalently and more combinatorially, the diagrammatic Hecke category. This has led, among other things, to a geometric proof of the linkage principle and a greatly simplified proof of Lusztig's character formula for large characteristics.

Participants

Adams, Thomas Robert (Cambridge), Andreychev, Grigory (Bonn), Arbesfeld, Noah (London), Baine, Joseph (Sydney), Barbier, Sigiswald (Gent), Bieker, Patrick (Darmstadt), Biswal, Rekha (Edinburgh), Burrull, Gaston (Sydney), Chatterjee, Tamanna (Athens), Ciappara, Joshua (Sydney), Cipriani, Alessio (Roma), Dhillon, Gurbir (New Haven), Eberhardt, Jens (Wuppertal), Eteve, Arnaud (Paris), Faergeman, Joakim (College Station), Faltings, Gerd (Bonn), Fintzen, Jessica (Bonn), Fratila, Dragos (Strasbourg), Gajda, Vincent (Freiburg i. Br.), Gannon, Tom (Austin), Garnier, Arthur (Amiens), Gibson, Joel (Sydney), Gouttard, Valentin (Orsay), Grodal, Jesper (København), Gruber, Jonathan (Lausanne), Heleodoro, Aron (Shatin, N.T., Hong Kong), Ivanov, Alexander (Bonn), Jaburi, Louis (London), Juteau, Daniel (Amiens), Kelly, Shane (Tokyo), Koziol, Karol (Ann Arbor), Kubrak, Dmitry (Bonn), Le, Daniel (West Lafayette), Le Bras, Arthur-César (Villetaneuse), Li, Yu (Bonn), Liu, Wille (Bonn), Liu, Yanjun (Kaiserslautern), Maltoni, Leonardo (Paris), Mazel-Gee, Aaron (Pasadena), Patimo, Leonardo (Freiburg i. Br.), Pauwels, Bregje (Sydney), Rogel, Liam (Kaiserslautern), Rossi, Damiano (London), Scholze, Peter (Bonn), Schwein, David (Cambridge), Soergel, Wolfgang (Freiburg i. Br.), Thorn, Erec (Kaiserslautern), van den Hove, Thibaud (Darmstadt), Van Order, Jeanine (Bielefeld), Viehmann, Eva (Münster), Wang, Yingying (Wuppertal), Westaway, Matthew (Birmingham), Williamson, Geordie (Sydney), Zabeth, Emilien (Aubière), Zaccanelli, Giovanni (Freiburg i. Br.), Zhang, Mingjia (Bonn)

09.10. - 14.10.2022 **Higher Rank Teichmüller Theory**

Organizers: Fanny Kassel, Bures-sur-Yvette
Beatrice Pozzetti, Heidelberg
Andres Sambarino, Paris
Anna Wienhard, Heidelberg

Abstract

Higher rank Teichmüller theory is the study of certain connected components of character varieties of surface groups in higher rank semisimple Lie groups, with the property that all elements in these components correspond to faithful representations with discrete image. Like classical Teichmüller theory, this relatively recent theory is very rich and builds on a combination of methods from various areas of mathematics. Its many facets were explored in detail during the Arbeitsgemeinschaft.

Participants

Appenzeller, Raphael (Zürich), Audibert, Jacques (Paris), Ballandras, Mathieu (Madrid), Barajas Ayuso, Guillermo (Madrid), Bénard, Timothée (Cambridge), Burelle, Jean-Philippe (Sherbrooke), Calderón, Irving (Durham), Camacho Cadena, Fernando (Heidelberg), Disarlo, Valentina (Heidelberg), Douba, Sami (Bures-sur-Yvette), Dowdall, Spencer (Nashville), Evans, Parker (Houston), Flaminio, Livio (Villeneuve d'Ascq), Flamm, Xenia (Zürich), Flechelles, Balthazar (Bures-sur-Yvette), Galiay, Blandine (Enghien-les-Bains), Gallego Sanchez, Guillermo (Madrid), Hsiao, Enya (Heidelberg), Jaeck, Victor Théo (Zürich), Kassel, Fanny (Bures-sur-Yvette), Kaufman, Dani (København), Lahn, Max (Ann Arbor), Li, Jialun (Zürich), Mallahi-Karai, Keivan (Bremen), Martone, Giuseppe (New Haven), Mazzoli, Filippo (Charlottesville), Mesbah, Abderrahim (Esch-sur-Alzette), Miller, Jared (Tallahassee), Moriani, Alex (Nice), Niemeyer, Merik (Heidelberg), Nolte, Alex (Houston), Pozzetti, Maria Beatrice (Heidelberg), Reid, Charles A. (Austin), Remfort-Aurat, Ulysse (Marseille), Ricci, Lisa (Zürich), Riestenberg, Max (Heidelberg), Rungi, Nicholas (Trieste), Sambarino, Andrés (Paris), Sert, Cagri (Zürich), Stecker, Florian (Austin), Thom, Andreas B. (Dresden), Thomas, Alexander (Heidelberg), Tsouvalas, Konstantinos (Bures-sur-Yvette), Ulirsch, Martin (Frankfurt am Main), Wang, Tianqi (Singapore), Weisman, Theodore (Austin), Wienhard, Anna Katharina (Leipzig), Zhu, Feng (Madison)

16.10. - 22.10.2022 **Quantitative Stochastic Homogenization**

Organizers: Antoine Gloria, Paris/Brussels
Felix Otto, Leipzig

Abstract

Homogenization means approximating the effective, i. e. macroscopic, behavior of a heterogeneous medium by a homogeneous one, which amounts to a substantial conceptual and practical reduction of complexity. Stochastic homogenization means that one is considering an ensemble of, i. e. a probability measure on, such heterogeneities (typically expressing a lack of knowledge of the details); and that the effective behavior is also deterministic next to being homogeneous. The aim of this Arbeitgemeinschaft is to present the recent progress in this field.

Participants

Bach, Annika (Roma), Barchiesi, Marco (Trieste), Bella, Peter (Dortmund), Bernou, Armand (Paris), Capoferri, Matteo (Edinburgh), Chatzigeorgiou, Georgiana (Leipzig), Cherdantsev, Mikhail (Cardiff), Cherednichenko, Kirill (Bath), Ciomaga, Adina (Paris), Clozeau, Nicolas (Klosterneuburg), Cottereau, Régis (Marseille), Dang, Spencer (University Park), Dario, Paul (Villeurbanne), Decio, Stefano (Minneapolis), Deuschel, Jean Dominique (Berlin), Dondl, Patrick (Freiburg i. Br.), Duerinckx, Mitia (Bruxelles), Fliss, Sonia (Palaiseau), Giovangigli, Laure (Palaiseau), Gloria, Antoine (Paris), Goepfert, Quentin (Palaiseau), Goffi, Fatima Zohra (Karlsruhe), Guo, Xiaoqin (Cincinnati), Hairer, Martin (London), Huang, Wei (Berlin), Irving, Christopher (Dortmund), Jeznach, Cole (Minneapolis), Josien, Marc (Saint-Paul-lès-Durance), Lee, David (Paris), Marino, Lorenzo (Warszawa), Marziani, Roberta (Dortmund), Morfe, Peter (Leipzig), Otto, Felix (Leipzig), Pappalettera, Umberto (Pisa), Pitcho, Jules (Lyon), Portinale, Lorenzo (Bonn), Raithel, Claudia (Wien), Ried, Tobias (Leipzig), Sau, Federico (Klosterneuburg), Schmidtchen, Markus (Dresden), Schneider, Matti (Karlsruhe), Schweiger, Florian (Rehovot), Singh, Harprit (London), Velcic, Igor (Zagreb), Wagner, Christian (Leipzig), Wang, Lihan (Leipzig), Weng, Weile (Berlin), Wiedemann, David (Augsburg), Xu, Qiang (Lanzhou City), Yuan, Shenglan (Augsburg)

2.7. Oberwolfach Seminare

Oberwolfach Seminar 2223a

05.06. - 11.06.2022 **Taxis-Type Evolution Systems: Modeling and Analysis**

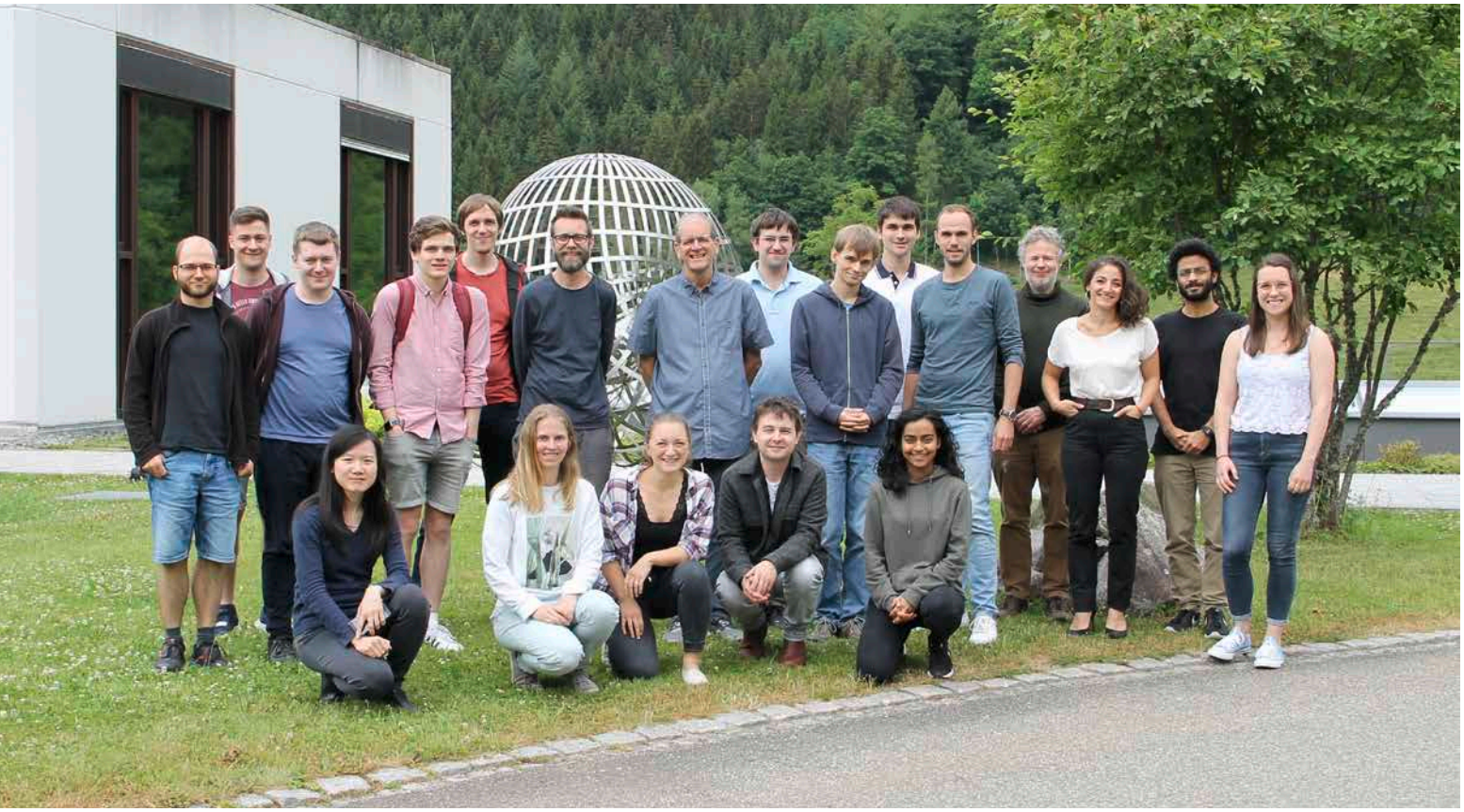
Organizers: Johannes Lankeit, Hannover
Christina Surulescu, Kaiserslautern
Michael Winkler, Paderborn
Anna Zhigun, Belfast

Abstract

How do taxis mechanisms influence the behavior of populations? Describing cross-diffusive motion by means of macroscopic evolutionary PDEs goes along with substantial challenges not only with regard to modeling, but especially also at the level of rigorous analysis. The aim of this seminar was to expose talented doctoral students and postdoctoral researchers to current developments in this thriving research area, attempting to showcase the lively interplay between application-oriented considerations on the one hand, and scrutinies focused on mathematical aspects on the other.

Participants

Ahn, Jaewook (Seoul), Bhattacharya, Apratim (Erlangen), Black, Tobias (Paderborn), Flüchter, Gregor (Paderborn), Fuest, Mario (Hannover), Heihoff, Frederic (Paderborn), Hiremath, Sandesh (Kaiserslautern), Hoberg, Maren (Hannover), Hussein, Amru (Kaiserslautern), Kim, Dongkwang (Seoul), Knosalla, Piotr (Opole), Lankeit, Johannes (Hannover), Lenz, Jonas (Mainz), Li, Genglin (Paderborn), Li, Yue (Mannheim), Luo, Demou (Guangzhou), Mohan, Nishith (Kaiserslautern), Rajendran, Mabel Lizzy (Belfast), Sanchis Agudo, Marcial (Uxbridge), Surulescu, Christina (Kaiserslautern), Tian, Yu (Paderborn), Winkler, Michael (Paderborn), Wu, Duan (Paderborn), Zhigun, Anna (Belfast)



05.06. - 11.06.2022 **G-Complete Reducibility, Geometric Invariant Theory and Spherical Buildings**

Organizers: Michael Bate, York
Benjamin Martin, Aberdeen
Gerhard Röhrle, Bochum

Abstract
The seminar is in a core area of algebraic group theory and at the interdisciplinary cross roads of algebra and representation theory on the one hand, geometry and geometric invariant theory on the other. The notion of G-complete reducibility for subgroups of a reductive algebraic group G was introduced by J-P. Serre in the 1990s as a natural generalization of the notion of complete reducibility in representation theory (which corresponds to the case where G is the general linear group). Since its introduction, this notion has been widely studied, both as an important concept in its own right, with applications to the structure of linear algebraic groups, and also as a useful tool with applications in representation theory, geometric invariant theory, the theory of buildings, and number theory.

Participants
Bate, Michael (York), Bischof, Sebastian (Gießen), Boehm, Soeren (Bochum), Ganeshalingam, Vanthana (Coventry), Hart, Simon (Heslington, York), Higgins, Adam (Heslington, York), Jeannin, Marion (Uppsala), Lischka, Fabio (Erlangen), Martin, Benjamin M. S. (Aberdeen), Pal, Abhik (La Jolla), Pechtl, Franziska (Erlangen), Peerenboom, Timm (Bochum), Pengelly, Rachel (Birmingham), Röhrle, Gerhard (Bochum), Sercombe, Damian (Bochum), Trost, Alexander (Bochum), Voggesberger, Laura (Kaiserslautern), Wang, Yingying (Wuppertal), Westaway, Matthew (Birmingham), Wiedemann, Torben (Gießen)

23.10. - 29.10.2022 **Free Boundary Problems in Fluid Dynamics**

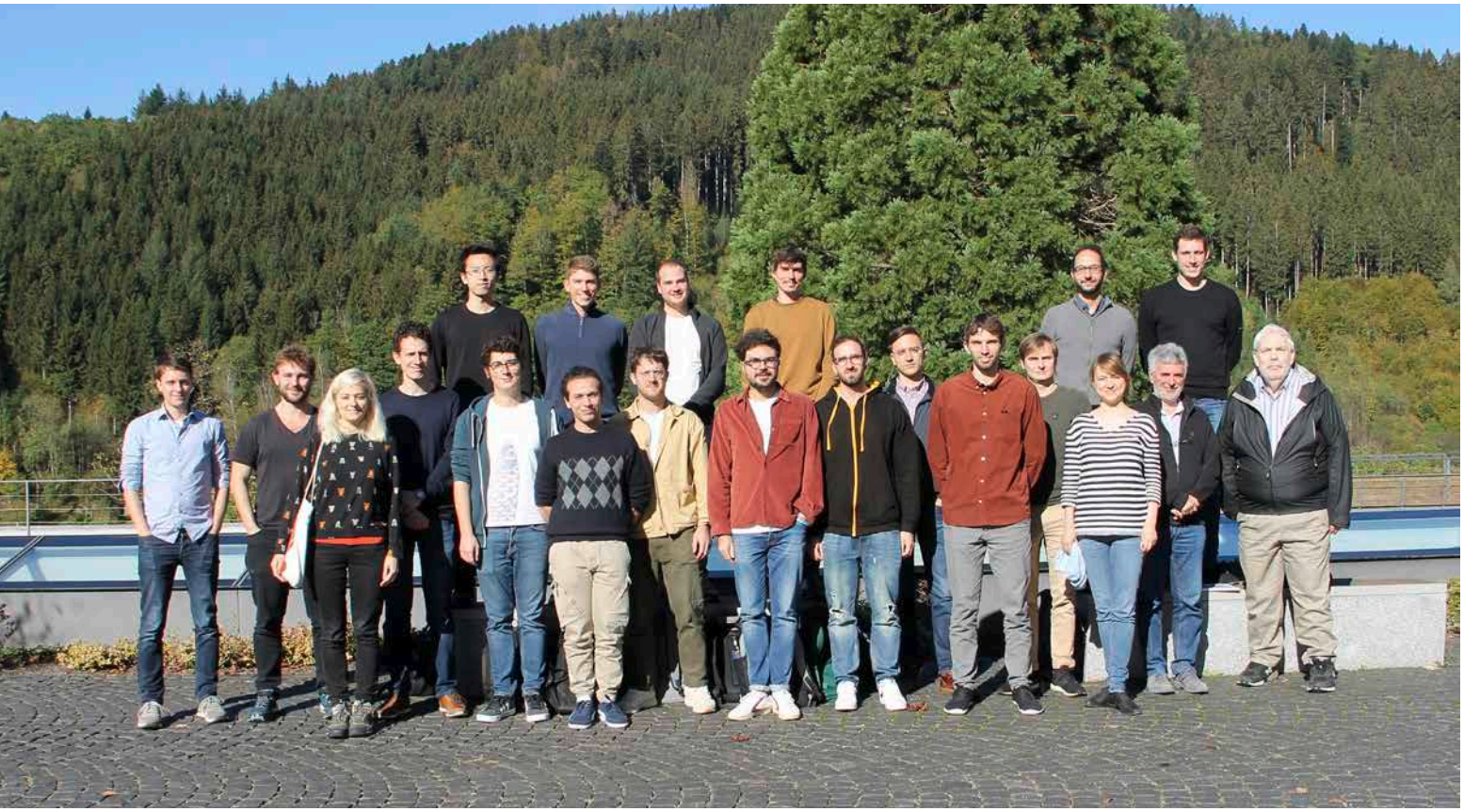
Organizers: Thomas Alazard, Gif-sur-Yvette
Mihaela Ifrim, Madison
Daniel Tataru, Berkeley

Abstract

Free boundary problems arise in the study of the motion of a fluid (gas) whenever the boundary of the fluid is allowed to move unconstrained, e.g. the water in the ocean or a gaseous star. How do free boundaries affect the equations and the dynamics of the fluid flow? The week-long seminar was devoted to such questions. The target audience was PhD students and post-doctoral researchers wishing to be quickly immersed in a modern, very active research area.

Participants

Ai, Albert (Madison), Alazard, Thomas (Gif-sur-Yvette), Avadanei, Ovidiu-Neculai (Berkeley), Byars, Allison (Madison), Ghosh, Amrita (Bonn), Huang, Xiaoyu (Berkeley), Ifrim, Mihaela (Madison), Laurens, Thierry (Los Angeles), Li, Zexing (Cambridge), Liu, Shao (Bonn), Paulsen, Martin Oen (Bergen), Pineau, Benjamin (Berkeley), Pompili, Lorenzo (Bonn), Rowan, James (Berkeley), Su, Pei (Praha), Tan, Jin (Cergy-Pontoise), Tataru, Daniel (Berkeley), Taylor, Mitchell (Berkeley), Wan, Lizhe (Madison), Weber, Jörg (Lund), Yang, Haocheng (Gif-sur-Yvette), Yu, Dongxiao (Bonn), Zanni, Angelo (Roma), Zhao, Alvis Donghan (New Brunswick)

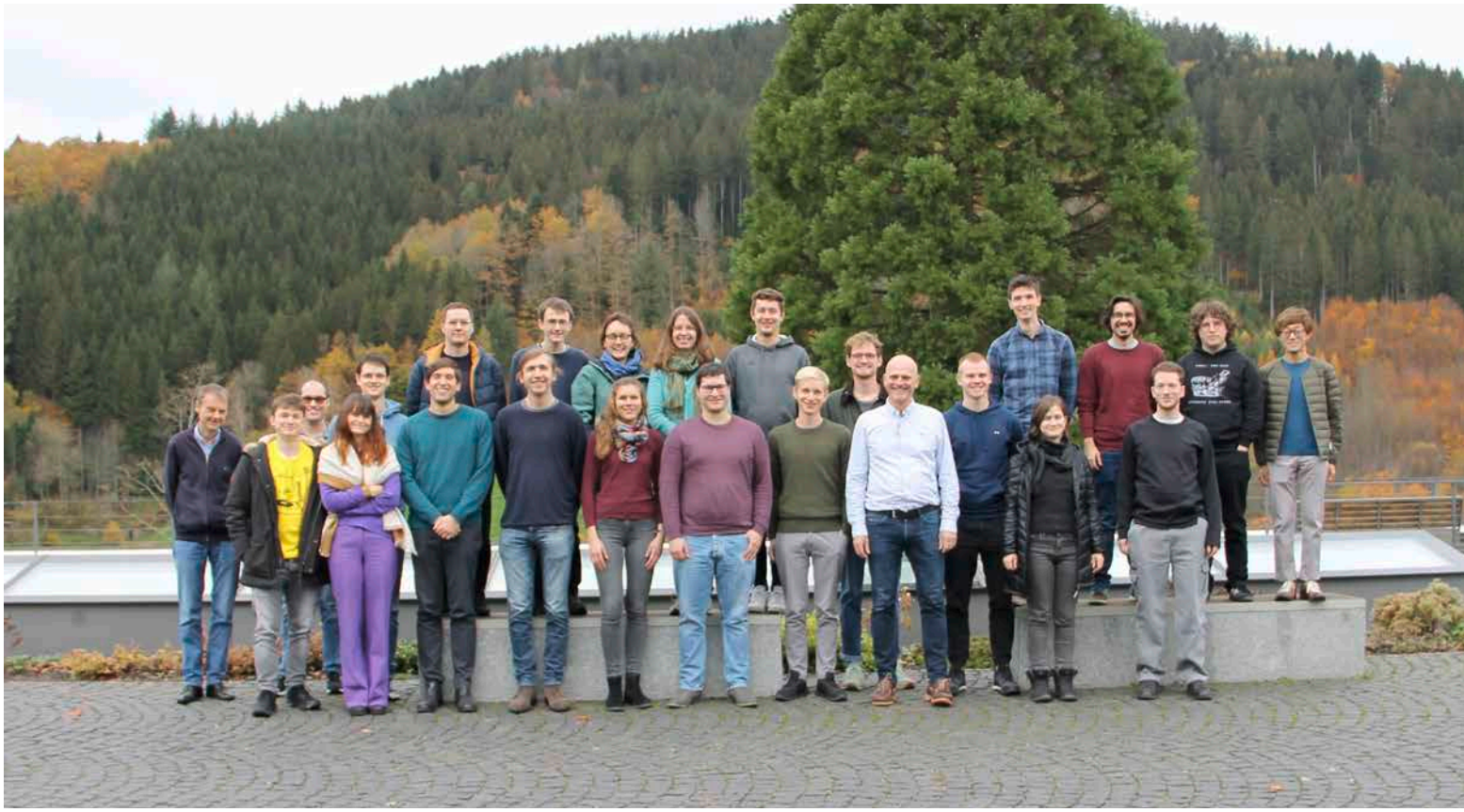


23.10. - 29.10.2022 **Stochastic Geophysical Fluid Dynamics**

Organizers: Franco Flandoli, Pisa
Darryl Holm, London
Amru Hussein, Kaiserslautern
Martin Saal, Darmstadt

Abstract
The mathematical study of geophysical fluid dynamics is at the foundation of many models in meteorology, climate science and geophysics. One central question is: How to account for uncertainties inherent in measurements and the estimation of physical parameters? Here, a stochastic point of view is often closer to the real-world applications than a purely deterministic one. In the lectures gave an introduction into several directions of the recent research on stochastic geophysical fluid dynamics and discuss different geophysical stochastic partial differential equations.

Participants
Agresti, Antonio (Klosterneuburg), Bagnara, Marco (Pisa), Beckermann, Paul (Kaiserslautern), Binz, Tim (Darmstadt), Boutros, Daniel (Cambridge), Flandoli, Franco (Pisa), Forstner, Philipp (Berlin), Galeati, Lucio (Lausanne), Grotto, Francesco (Pisa), Heidrich, Erik (Kaiserslautern), Holm, Darryl D. (London), Hu, Ruiao (London), Hussein, Amru (Kaiserslautern), Lange, Theresa (Bielefeld), Leahy, James-Michael (London), Luesink, Erwin (Enschede), Luongo, Eliseo (Pisa), Mayorcas, Avi (Cambridge), Pappalettera, Umberto (Pisa), Saal, Martin (Darmstadt), Shevchenko, Radomyra (Hamburg), Tempelmayr, Markus (Leipzig)



20.11. - 26.11.2022 **Interfaces: Modeling, Analysis, Numerics**

Organizers: Eberhard Bänsch, Erlangen
Klaus Deckelnick, Magdeburg
Harald Garcke, Regensburg
Paola Pozzi, Essen

Abstract

The evolution of surfaces plays an important role in geometry, applied mathematics and in the natural sciences and typically leads to fascinating shapes and patterns. In this seminar geometric evolution equations such as mean curvature flow and surface diffusion were studied as examples of gradient flows of the area functional. Also in many free boundary problems the motion of an interface is given by an evolution law involving curvature quantities. In particular, we introduced the Mullins-Sekerka flow and the Stefan problem with its anisotropic variants, Willmore flow as well as two-phase flows and discuss analytical and numerical approaches to deal with them.

Participants

Alemán, Tilman (Aachen), Bäcker, Jan-Phillip (Dortmund), Brunk, Aaron (Mainz), Deckelnick, Klaus (Magdeburg), Eto, Tokuhiro (Tokyo), Fornoni, Matteo (Pavia), Fuchs, Jakob (Dortmund), Garcke, Harald (Regensburg), Hanot, Marien (Montpellier), Herbert, Philip (Edinburgh), Ivaniszyn, Barbara Solange (Ciudad de Santa Fe), Langer, Leonie (Ulm), Lukic, Sasa (Aachen), Marveggio, Alice (Klosterneuburg), Mavrakis, Achilleas (Coventry), Minarcik, Jiri (Praha), Pozzi, Paola (Essen), Sales, Tom (Coventry), Schlierf, Manuel (Ulm), Schmeller, Leonie (Berlin), Schmitz, Lina (Hannover), Schwering, Paul (Aachen), Smoch, Christoph (Bonn), Trautwein, Dennis (Regensburg), Ullrich, Clemens (Erlangen)

20.11. - 26.11.2022 **Operator-Adapted Spaces in Harmonic Analysis and PDEs**

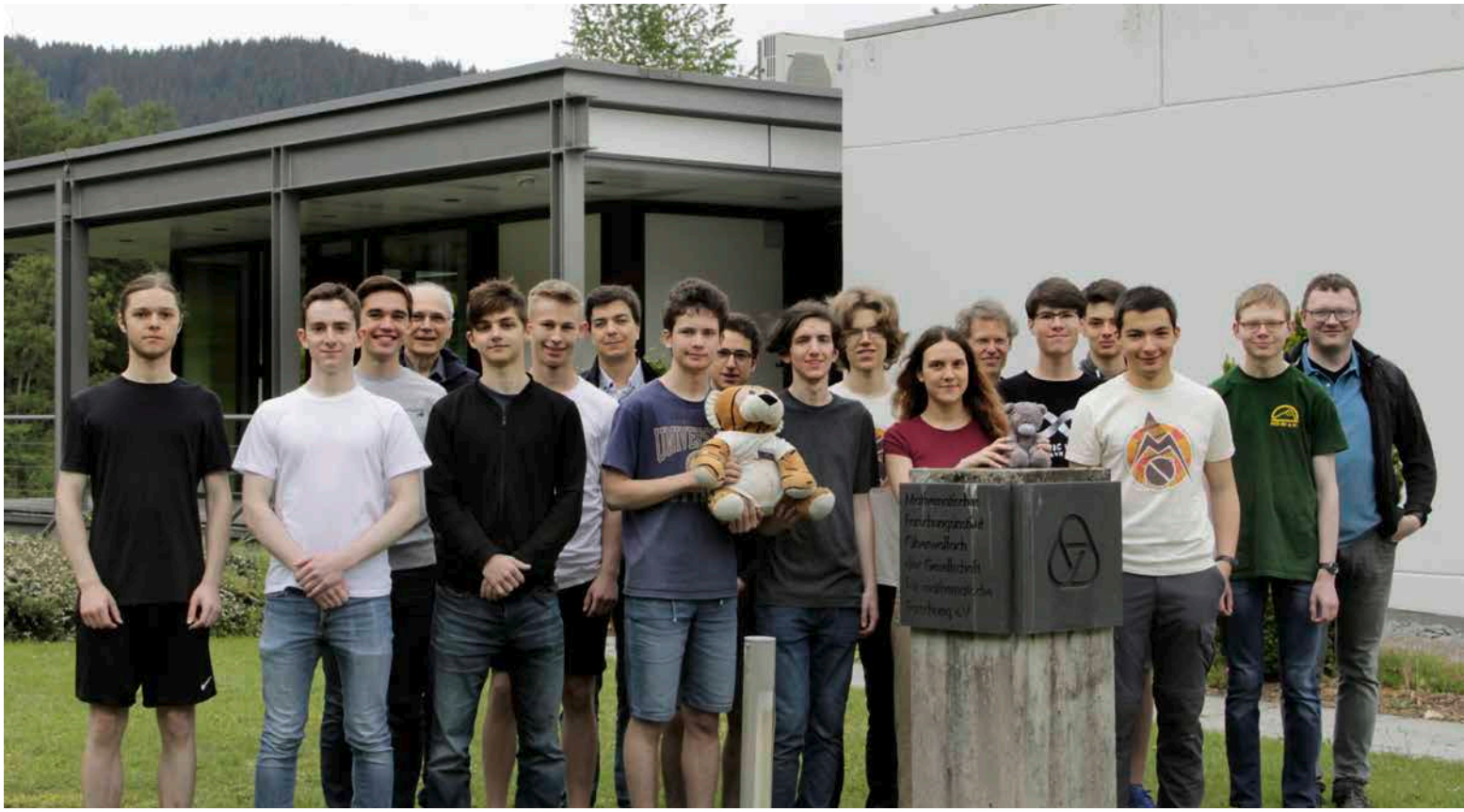
Organizers: Pascal Auscher, Orsay
Moritz Egert, Darmstadt
Dorothee Frey, Karlsruhe

Abstract
Do solutions to linear PDEs naturally live in classical function spaces measuring integrability and smoothness? Or are there spaces with a richer structure, specifically designed for every equation? In seminar we took the second point of view and delved into the theory of operator-adapted Hardy spaces for elliptic and dispersive PDEs. The target audience is PhD students or post-doctoral researchers wishing to be quickly immersed in a modern, active research area.

Participants
Auscher, Pascal (Orsay), Bechtel, Sebastian (Delft), Bilz, Constantin (Karlsruhe), Böhnlein, Tim (Darmstadt), Brocchi, Gianmarco (Göteborg), Dumont, Arnaud (Bruxelles), Egert, Moritz (Darmstadt), Frey, Dorothee (Karlsruhe), Gaudin, Anatole (Marseille), Haardt, Luca (Mainz), He, Zihui (Bielefeld), Heister, Henning (Karlsruhe), Hou, Hedong (Orsay), Lenz, Jonas (Mainz), Lorist, Emiel (Delft), Mesfun, Yonas (Karlsruhe), Mnatsakanyan, Gevorg (Bonn), Naderi, Kiyan (Oldenburg), Poggio, Andrea (Genova), Pompili, Lorenzo (Bonn), Vasilyev, Ioann (Orsay), Wang, Shan (Créteil), Zanni, Angelo (Roma), Zhang, Hong-Wei (Gent), Zhang, Wenqi (Canberra)

2.8. Weitere Fortbildungsveranstaltungen / Further training weeks

Internationale Mathematik-Olympiade 2221a



22.05. - 28.05.2022 **Trainings- und Abschlussseminar für die Internationale Mathematik-Olympiade**

Organizers: Patrick Bauermann, Bonn
Eric Müller, Münster
Jürgen Prestin, Lübeck

Abstract
After a two-year break due to the Covid-19 pandemic the Institute hosted again the final week of the preparation seminars for the German candidates for the International Mathematical Olympiad (IMO). Sixteen young people made it to the final round of the selection competition. Six of them became part of the team that traveled to Oslo and participated at the IMO. The German selection competition and the preparatory seminars are organized by "Bildung & Begabung", the talent promotion center of the federal and state governments.

Participants
Bauermann, Patrick; Bernert, Christian; Elbrandt, Florian; Friedrich, Cedric; Gabsdil, Ole; Gaiduk, Olesia; Galatenko, Dimitri; Kaganskiy, Juri; Lörke, Timo; Mann, Boldizsár; Meyer, Samuel; Müller, Eric; Noaghiu, Christian; Paolella, Finley; Prestin, Jürgen; Reinhold, Jens; Schmidt, Paul Jakob; Schoss, Matti; Schröter, Georg; Siegert, Philipp; Singh, Ritvij

Photo: courtesy of Wilderich Tuschmann

20.11. - 25.11.2022 **Geometry and Topology of Compact Homogeneous Spaces**

Organizers: Stephan Klaus, Oberwolfach
Wilderich Tuschmann, Karlsruhe

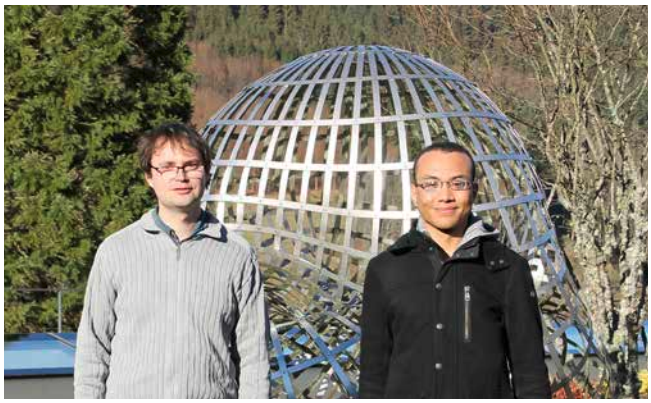
Abstract
The seminar addressed to graduate students who were interested to deepen not only standard results about simply connected compact homogeneous spaces but also to learn more specialized topics, e.g. on the classification of such spaces, exotic structures and moduli spaces of metrics with special curvature properties. There is an algorithm to construct all irreducible pairs of compact Lie groups below a given dimension and we will apply this to classify such spaces up to dimension 8. As a surprise, in dimension 7 there are infinitely many exotic spaces, but in dimension 8 there are 20 diffeomorphism types only. Compact homogeneous spaces do also play a prominent role in global Riemannian geometry and the theory of non-negative and positive sectional curvature. Indeed, many spaces with these curvature properties arise here from taking an isometric quotient of a compact Lie group equipped with a bi-invariant metric, and we will treat the classification of all simply connected, compact positively curved Riemannian homogeneous spaces. We also dealt with the question what the space of all non-negatively or positively curved metrics on certain given manifolds M looks like, and considered its moduli space, i.e., its quotient by the full diffeomorphism group of M, acting by pulling back metrics. Compact homogeneous spaces have in these studies also been of eminent importance.

Participants
Araújo, Roberto (Münster), Boldt, Sebastian (Leipzig), Degen, David (Karlsruhe), Dillmann, Pia (Münster), Flamencourt, Brice (Stuttgart), Glöckle, Jonathan (Regensburg), Henkel, Jonas (Marburg), Klaus, Stephan (Oberwolfach), Kula, Mateusz (Katowice), Kupper, Philippe (Karlsruhe), Lammers, Lars (Göttingen), Müller, Niklas Maximilian (Essen), Naujoks, Henrik (Marburg), Nepechiy, Artem (Augsburg), Otto, Niklas R. (Dortmund), Púcek, Roland (Jena), Richtsfeld, Alberto (Potsdam), Schwahn, Paul (Stuttgart), Sukhorebska, Darya (Münster), Tuschmann, Sturmius (Münster), Tuschmann, Wilderich (Karlsruhe), Wei, Xikai (Karlsruhe), Wulle, Dennis (Münster), Xu, Fupeng (Beijing), Zhu, Fangjun (Evanston)

2.9. Oberwolfach Research Fellows

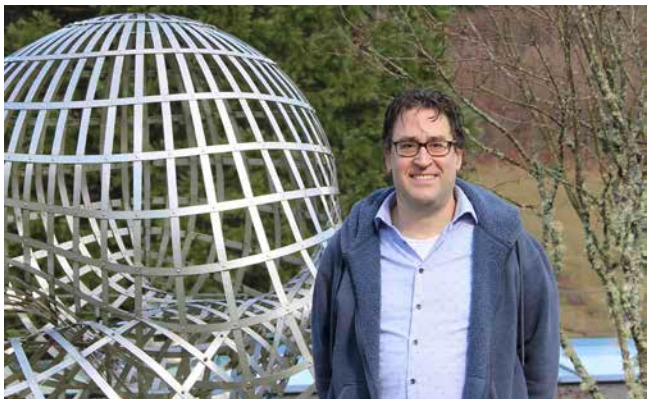
Christin Bibby, Baton Rouge (left)
Emanuele Delucchi, Fribourg (right)

02.01. - 15.01.2022



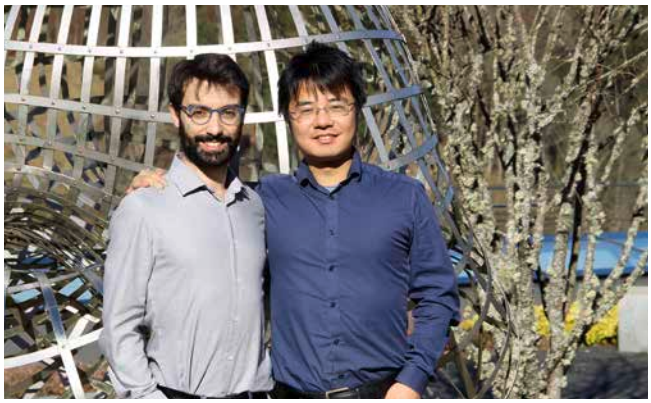
Nikolai Edeko, Zürich (right)
Henrik Kreidler, Wuppertal (left)

16.01. - 29.01.2022



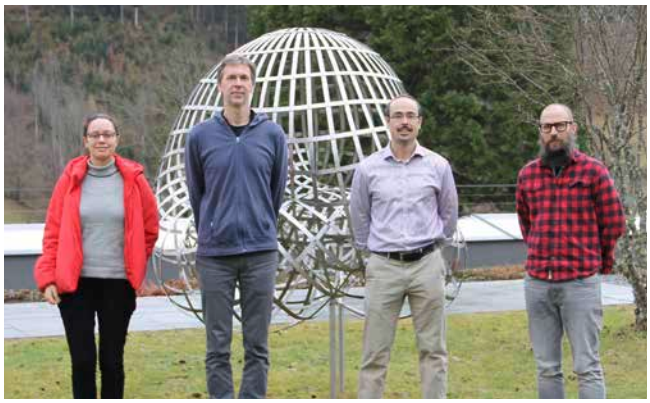
Marco Merkli, St. John's

09.01. - 26.02.2022



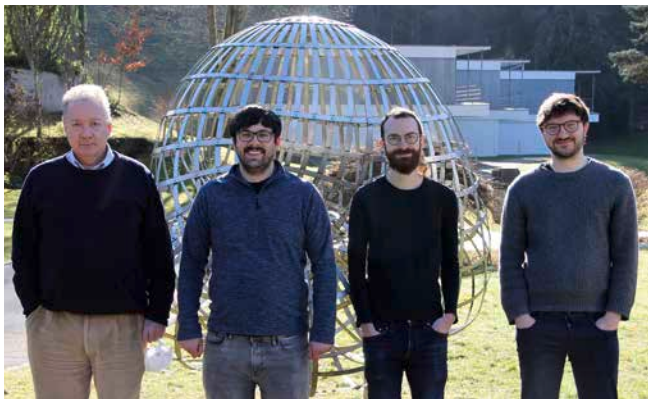
Amaury Hayat, Champs-sur-Marne (left)
Shengquan Xiang, Lausanne (right)

30.01. - 12.02.2022



Jehanne Dousse, Villeurbanne (left)
Jeremy Lovejoy, Paris (middle left)
Robert Osburn, Dublin (right)
Armin Straub, Mobile (middle right)

09.01. - 22.01.2022



Scott Balchin, Bonn (middle right)
John Greenlees, Coventry (left)
Luca Pol, Regensburg (right)
Jordan Williamson, Prague (middle left)

30.01. - 12.02.2022

Corina Ciobotaru, Valcea

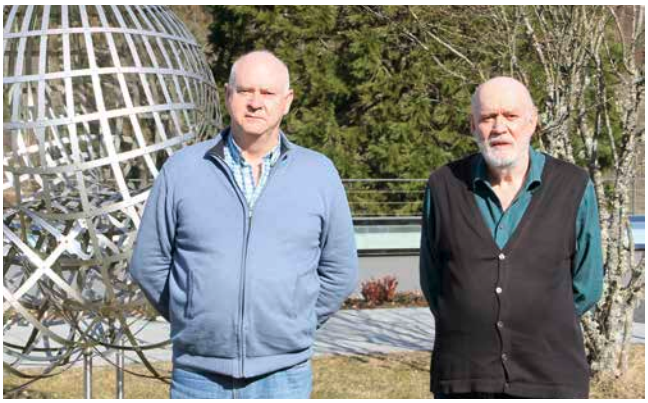
06.02. - 09.04.2022

Joshua Maglione, Bielefeld (left)
Mima Stanojkovski, Leipzig (right)

27.02. - 12.03.2022

Eduard Feireisl, Praha (left)
Mária Lukáčová-Medvidová, Mainz (middle right)
Bangwei She, Praha (right)
Yuhuan Yuhan, Mainz (middle left)

13.02. - 26.02.2022



Guillermo P. Curbera, Sevilla (left)
Werner J. Ricker, Eichstätt (right)

06.03. - 26.03.2022

Cristina Butucea, Palaiseau (right)
Angelika Rohde, Freiburg (middle)
Lukas Steinberger, Wien (left)

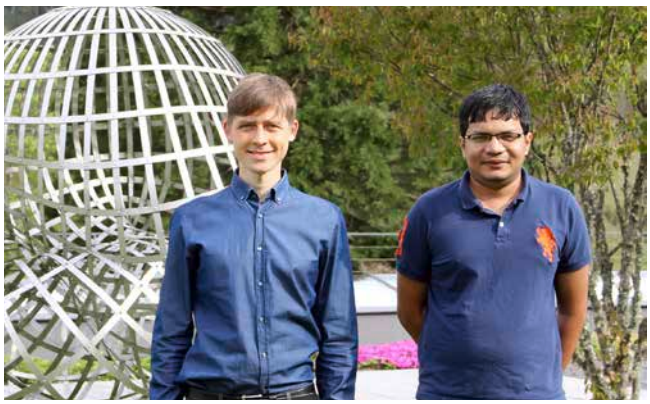
13.02. - 26.02.2022

Sofia G. Mogilevskaya, Minneapolis (right)
Dominik Schillinger, Hannover (middle)
Anna Y. Zemlyanova, Manhattan KS (left)

06.03. - 19.03.2022

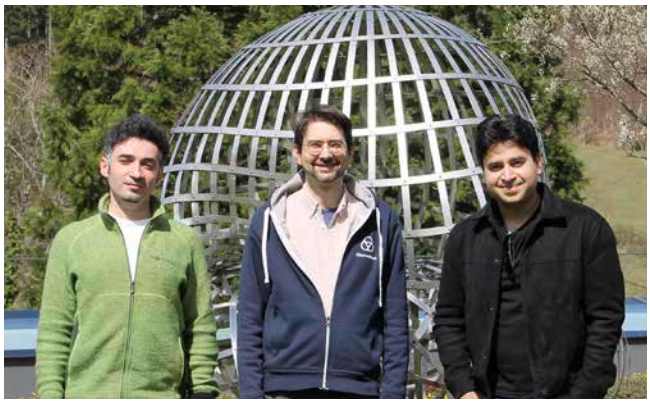
Ilia Itenberg, Paris (left)
Eugenii Shustin, Tel Aviv (right)

13.03. - 26.03.2022



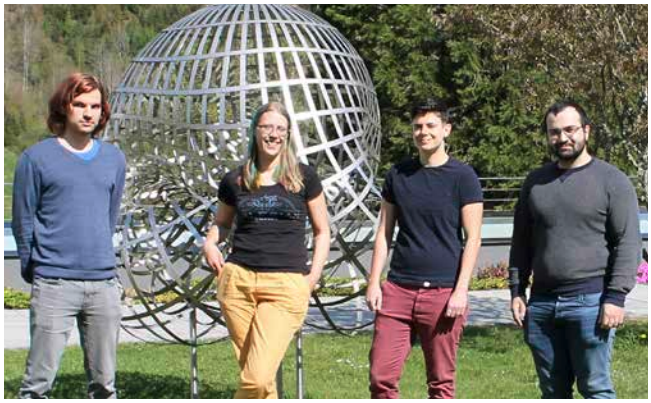
Arindam Biswas, Copenhagen (right)
Pavlo Yatsyna, Praha (left)

03.04. - 30.04.2022



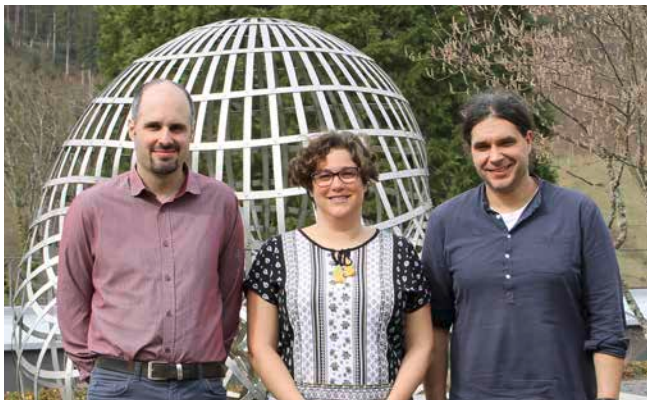
Arman Darbinyan, Austin (left)
Yash Lodha, Lausanne (right)
Markus Steenbock, Rennes (middle)

20.03. - 16.04.2022



Melanie Graf, Tübingen (middle left)
Eleni Kontou, Amsterdam (middle right)
Argam Ohanyan, Wien (right)
Benedict Schinnerl, Wien (left)

10.04. - 23.04.2022

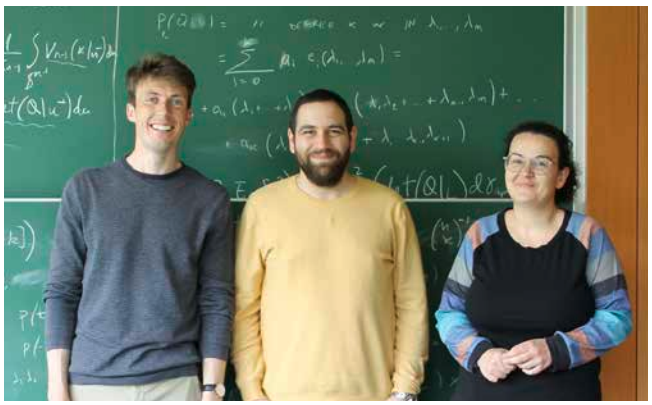


Petra Csomos, Budapest (middle)
Bálint Farkas, Wuppertal (right)
Balázs Kovács, Regensburg (left)

27.03. - 02.04.2022

Jeanine Van Order, Bielefeld

10.04. - 07.05.2022

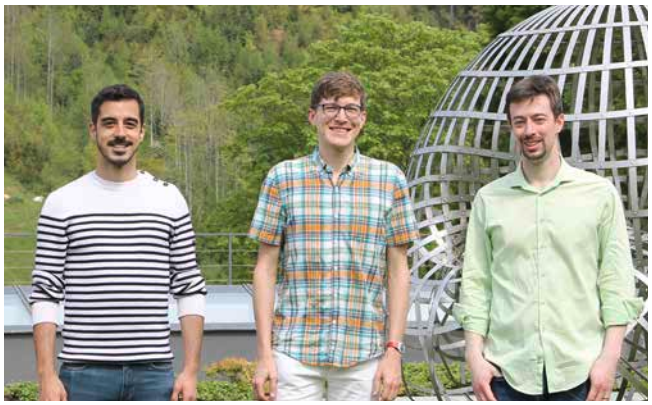


Christopher De Vries, Bremen/Sapporo (left)
Nico Lombardi, Wien (middle)
Eugenia Saorin Gómez, Bremen (right)

24.04. - 07.05.2022

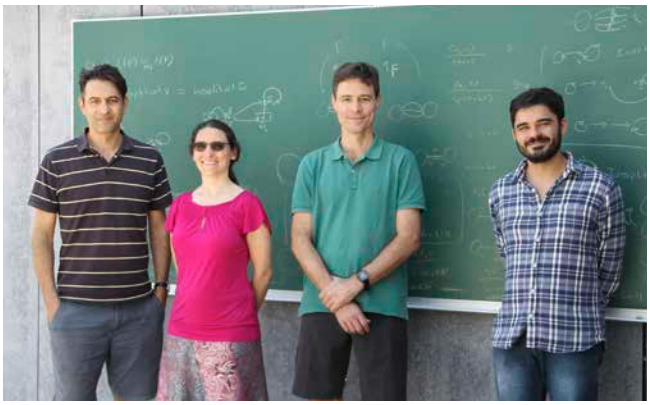
Sabine El Khoury, Beirut (middle right)
Sara Faridi, Halifax (right)
Liana Sega, Kansas City (left)
Sandra Spiroff, Oxford MS (middle left)

15.05. - 28.05.2022



Clément Dupont, Montpellier (left)
Erik Panzer, Oxford (middle)
Brent Pym, Montreal (right)

01.05. - 14.05.2022

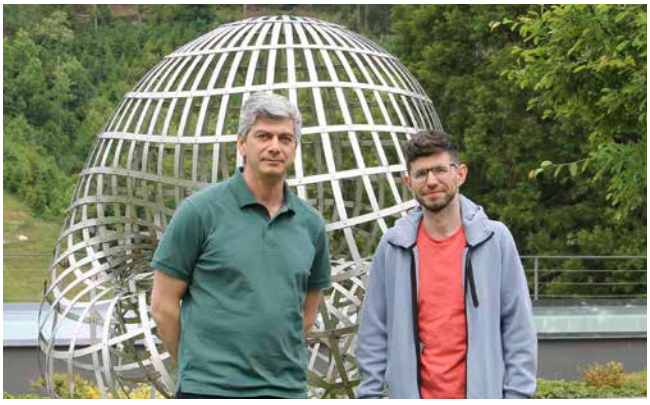


Luiz Gustavo Cordeiro, Florianopolis (right)
Elizabeth Gillaspy, Missoula (middle left)
Daniel Goncalves, Florianopolis (middle right)
Roozbeh Hazrat, Sydney (left)

15.05. - 28.05.2022

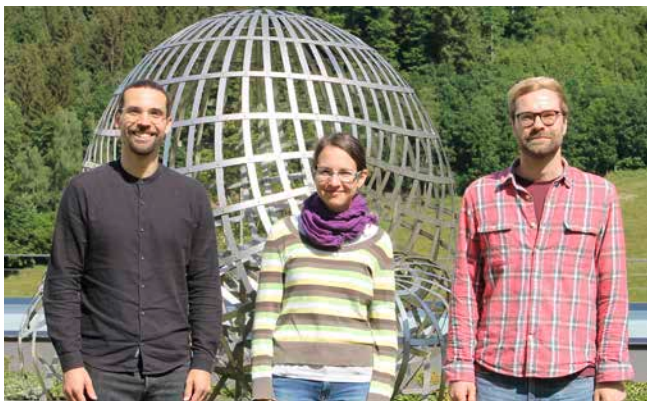
Christopher French, Grinnell (right)
Paul-Hermann Zieschang, Brownsville (left)

08.05. - 21.05.2022



Anton Izosimov, Arizona (right)
Boris Khesin, Toronto (left)

22.05. - 04.06.2022

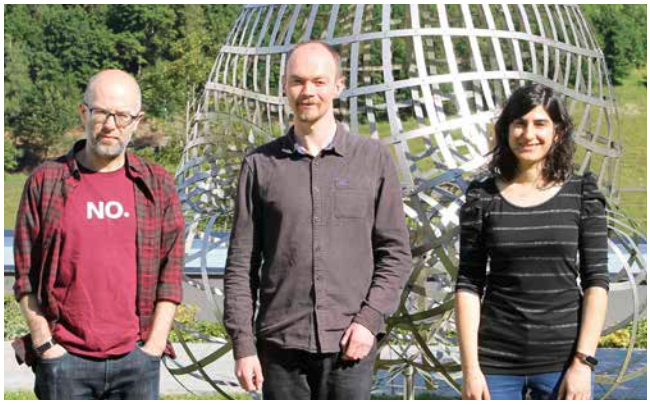


Lea Boßmann, Klosterneuburg (middle)
Nikolai Leopold, Basel (left)
Sören Petrat, Bremen (right)
Simone Rademacher, Klosterneuburg

29.05. - 11.06.2022

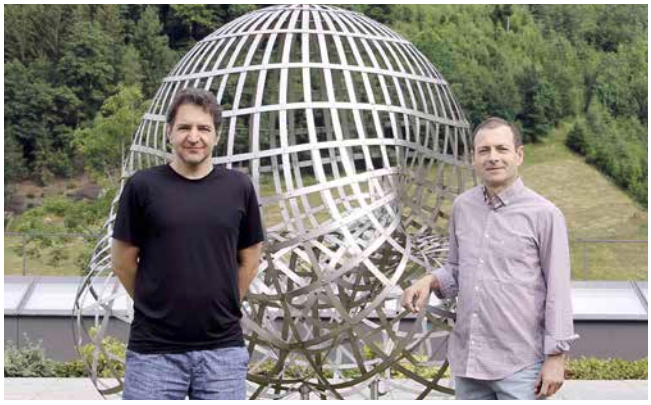
Helge Ruddat, Mainz (right)
Alessio Corti, London (left)

05.06. - 11.06.2022



Carsten Dietzel, Stuttgart (middle)
Paula Menchón, Buenos Aires (right)
Leandro Vendramin, Brussels (left)

29.05. - 11.06.2022



Laurentiu Maxim, Madison (left)
Mihai Tibar, Lille (right)

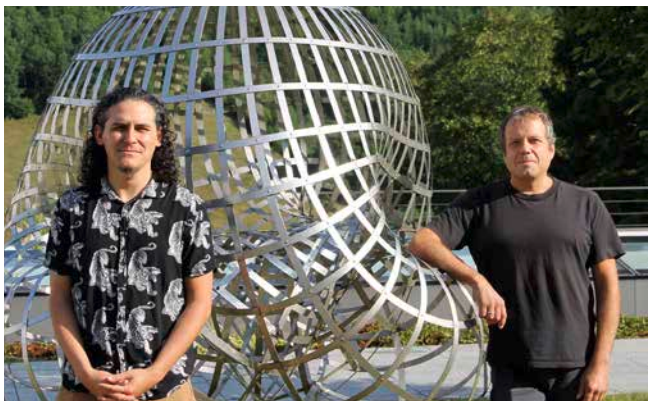
12.06. - 25.06.2022

Quentin Gazda, Bonn (left)
Damien Junger, Münster (right)

29.05. - 11.06.2022

Renee Hoekzema, Oxford (right)
Carmen Rovi, Heidelberg (left)
Julia Semikina, Münster (middle)

12.06. - 25.06.2022

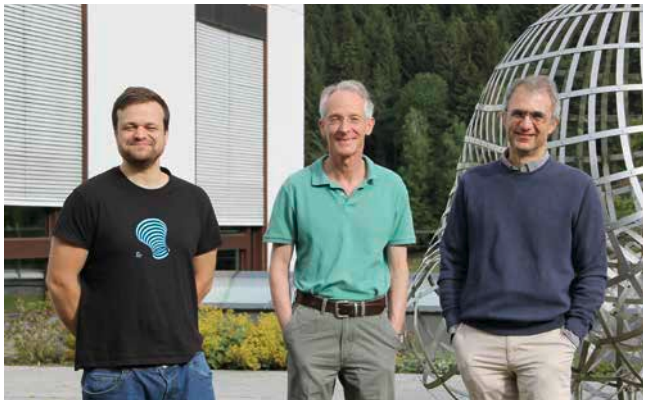


Jenia Tevelev, Amherst (left)
Giancarlo Urzua, Santiago de Chile (right)

19.06. - 02.07.2022

Nicolas Ginoux, Metz (left)
Georges Habib, Fanar-Matn (right)
Simons Raulot, Saint-Étienne-du-Rouvray

10.07. - 23.07.2022

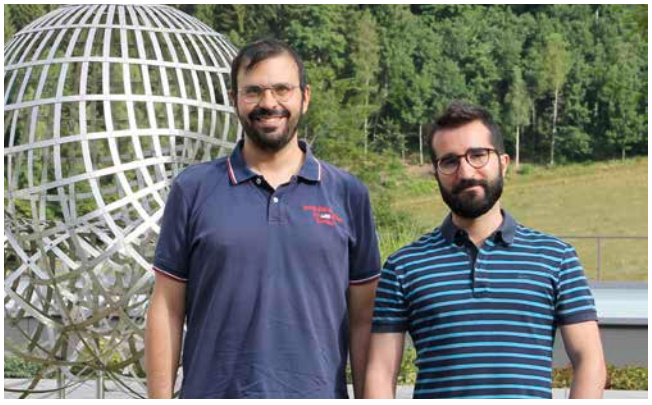


Thomas Baumgarte, College Station (right)
Carsten Gundlach, Southampton (middle)
David Hilditch, Lissabon (left)

26.06. - 09.07.2022

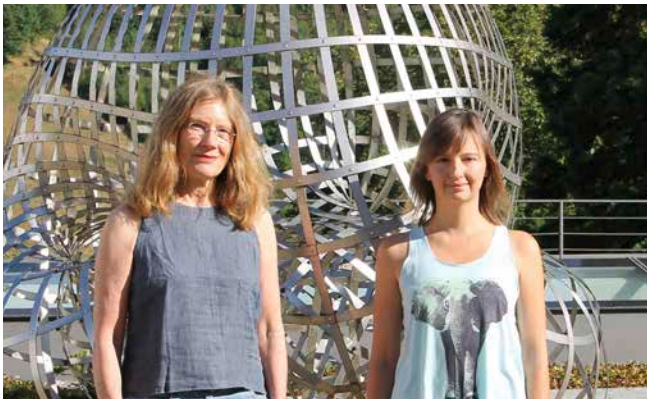
René Schilling, Dresden (left)
Renming Song, Urbana-Champaign
Zoran Vondracek, Zagreb (right)

10.07. - 23.07.2022



Mauro Porta, Strasbourg (left)
Francesco Sala, Pisa (right)

03.07. - 16.07.2022



Agatha Atkarskaya, Jerusalem (right)
Katrin Tent, Münster (left)

10.07. - 23.07.2022

Sara Faridi, Halifax (right)
Huy Tài Hà, New Orleans (left)
Takayuki Hibi, Osaka (middle right)
Susan Morey, San Marcos (middle left)

24.07. - 06.08.2022

Tamara Kucherenko, New York (middle right)
Martin Schmoll, Clemson (left)
Christian Wolf, New York (right)
Yun Yang, Blacksburg (middle left)

07.08.2022 - 20.08.2022

Sarah Hart, London
Veronica Kelsey, St Andrews (left)
Peter Rowley, Manchester (right)

24.07. - 06.08.2022

Trachette Jackson, Ann Arbor (middle right)
Harsh Jain, Duluth (left)
Kerri-Ann Norton, Annandale-on-Hudson (middle left)
Bernardo Bianco Prado, Ann Arbor (right)

07.08. - 27.08.2022

Claudia Polini, Notre Dame (left)
Bernd Ulrich, West Lafayette (right)

24.07. - 06.08.2022

Sandra Bella, Paris

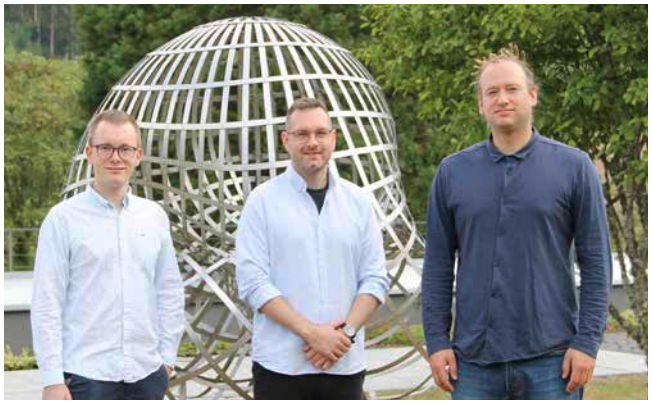
31.07. - 24.09.2022

Adrián Gonzalez Casanova, Mexico City (left)
Charline Smadi, Grenoble (middle)
Anton Wakolbinger, Frankfurt (right)

21.08. - 03.09.2022

Antoni Malet, Barcelona

18.09. - 12.11.2022

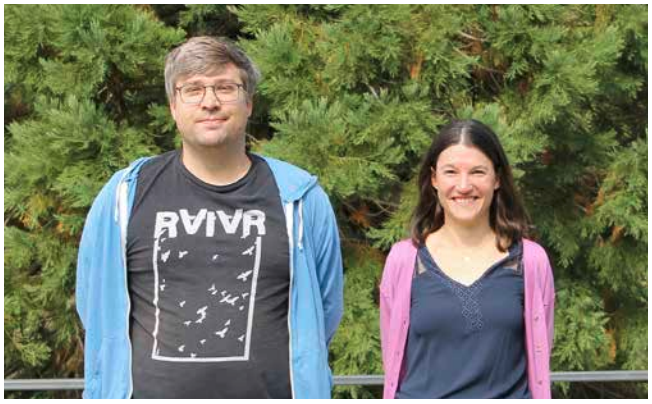


Jan Glaubitz, Hanover NH (middle)
Simon-Christian Klein, Braunschweig (left)
Jan Nordström, Linköping
Philipp Öffner, Mainz (right)

28.08. - 10.09.2022

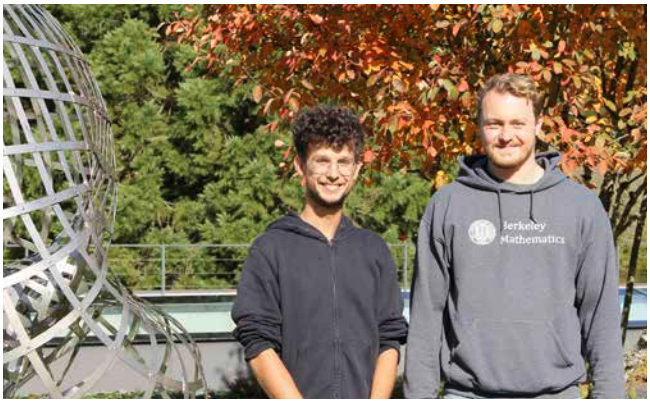
Gerhard Knieper, Bochum (right)
Norbert Peyerimhoff, Durham (left)

18.09. - 08.10.2022



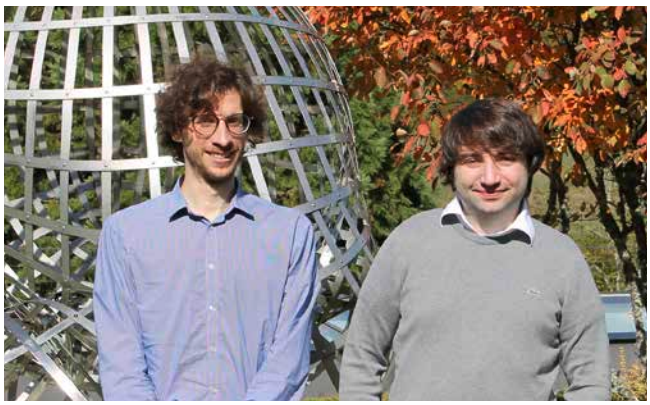
Eleonore Faber, Leeds (right)
Bernd Schober, Oldenburg (left)

11.09. - 24.09.2022



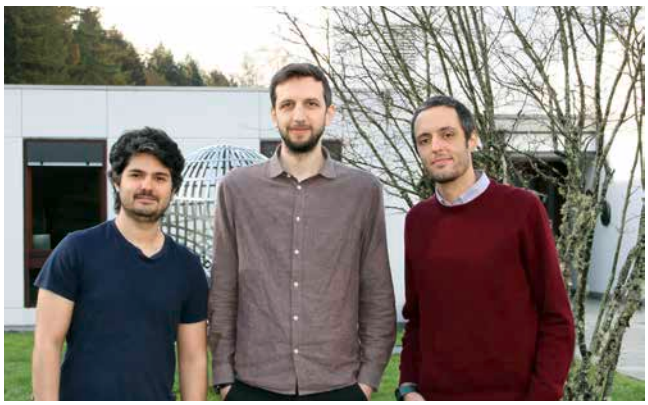
Fabian M. Faulstich, Berkeley (right)
Mathias Oster, Berlin (left)

02.10. - 15.10.2022



Alberto Chiarini, Padova (left)
Maximilian Nitzschner, New York (right)

02.10. - 15.10.2022



Adolfo Arroyo-Rabasa, Louvain-La-Neuve (left)
Paolo Bonicatto, Coventry (right)
Giacomo Del Nin, Coventry (middle)

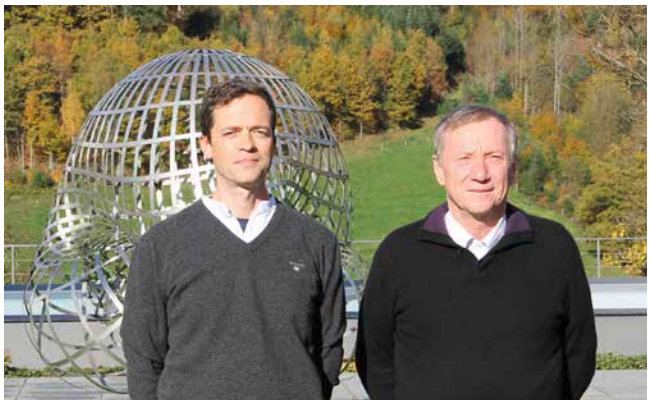
30.10. - 12.11.2022

Francis Burstall, Bath (middle left)
Joseph Cho, Wien (right)
Mason Pember, London (left)
Gudrun Szewieczek, Wien (middle right)

16.10. - 29.10.2022

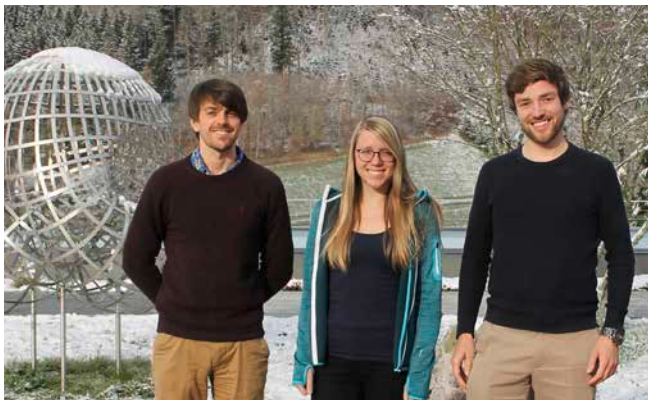
Federico Castillo, Pontificia (middle right)
Yairon Cid-Ruiz, Leuven (middle left)
Fatemeh Mohammadi, Leuven (left)
Jonathan Montano, Las Cruces (right)

27.11. - 17.12.2022



Adam Parusinski, Nice (right)
Armin Rainer, Wien (left)

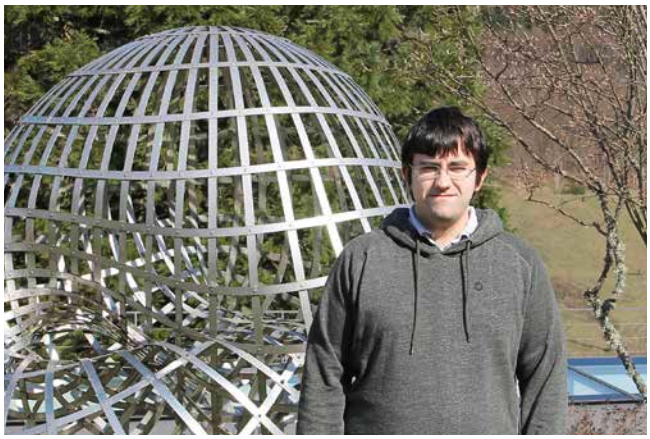
30.10. - 19.11.2022



Thomas Cope, Hannover (left)
Alexander Hahn, Sydney (right)
Ramona Wolf, Zürich (middle)

04.12. - 17.12.2022

2.10. Oberwolfach Leibniz Fellows



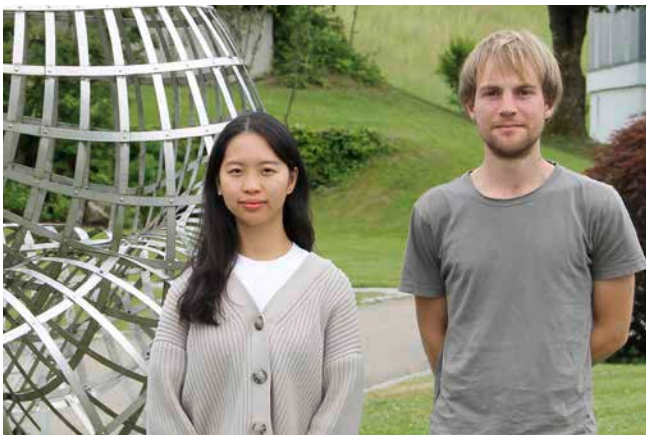
Alexander Trost, Bochum

02.01. - 26.03.2022

external guest researchers:

Bastien Karlhofer, Aberdeen
24.01. - 04.02.2022

Benjamin M.S. Martin, Aberdeen
20.03. - 26.03.2022

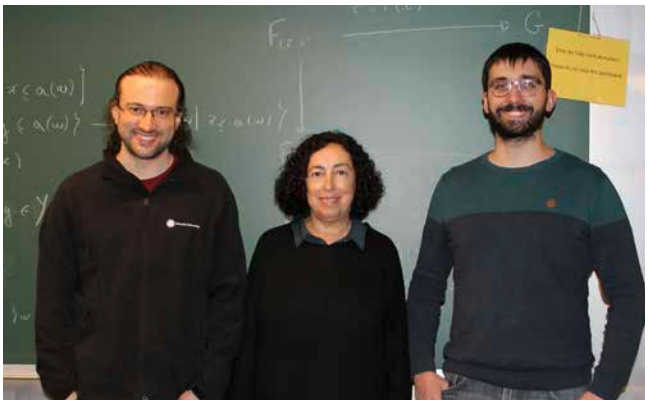


Thu Hien Nguyen, Kharkiv (left)

01.04. - 30.06.2022

external guest researcher:

Alexander Elzenaar, Leipzig (right)
05.06. - 16.06.2022



Fernando Lucatelli Nunes, Coimbra (left)

06.03. - 16.04.2022
17.07. - 27.08.2022

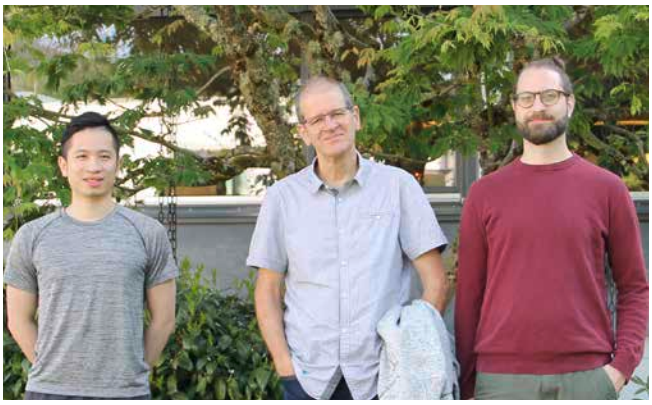
external guest researchers:

Maria Manuel Clementino, Coimbra (middle)
06.03. - 16.03.2022

Rui Prezado, Coimbra (right)
14.03. - 26.03.2022
17.07. - 23.07.2022

Matthijs I.L. Vákár, Utrecht
02.04. - 12.04.2022

Lurdes Sousa, Coimbra
24.07. - 02.08.2022



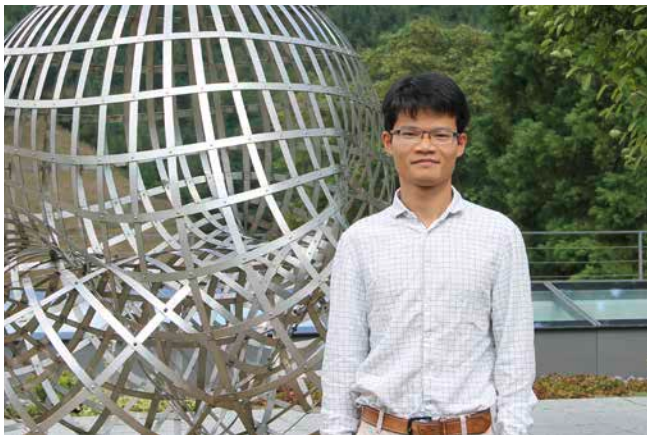
Paul Mücksch, Bochum (right)

03.04. - 26.05.2022

external guest researchers:

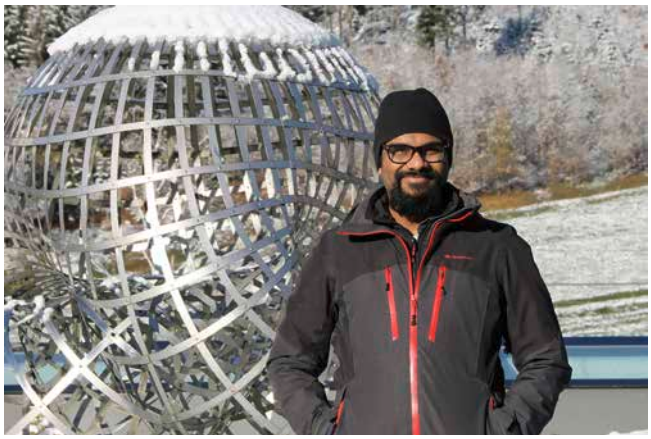
Gerhard Röhrle, Bochum (middle)
15.05. - 20.05.2022

Tan Nhat Tran, Bochum (left)
15.05. - 20.05.2022



Viet Cuong Pham, Bonn

03.07. - 30.07.2022



Rahul Gupta, Regensburg

02.10. - 17.12.2022

Charu Goel, Nagpur

24.09. - 16.10.2022

Yang Yang, Hamburg

25.09. - 17.12.2022

2.11. Publikationen 2022

Das MFO unterstützt die Idee von Open Access. Daher sind alle Publikationen auf der Webseite publications.mfo.de elektronisch frei verfügbar (mit Ausnahme der Buchreihe Oberwolfach Seminars beim Birkäuser Programm von Springer).

Oberwolfach Reports (OWR)

OWR wird in Zusammenarbeit mit EMS Press veröffentlicht und enthält die Ergebnisse der Workshops, Miniworkshops und Arbeitsgemeinschaften in Form von erweiterten Abstracts der Vorträge. Für 2022 sind die Bände OWR 19.1 bis 19.4 mit mehr als 3.000 Seiten erschienen.

Oberwolfach Preprints (OWP)

In OWP werden Resultate von längerfristigen Forschungsaufenthalten publiziert, aber auch von mathematischen Vorträgen im Rahmen von besonderen Veranstaltungen des MFO. 2022 sind die folgenden Preprints erschienen:

2.11. Publications 2022

The MFO supports the idea of open access. Hence, all publications are freely available on the website publications.mfo.de (with the exception of the book series Oberwolfach Seminars from the Birkhäuser program at Springer).

Oberwolfach Reports (OWR)

OWR is published in cooperation with EMS Press and contains extended abstracts of the talks in the Workshops, Mini-Workshops, and Arbeitsgemeinschaften. For 2022, the issues OWR 19.1 to 19.4 were published with more than 3,000 pages in total.

Oberwolfach Preprints (OWP)

OWP mainly contains research results related to a longer stay in Oberwolfach, but this can also include lectures held during special occasions in Oberwolfach. The following Preprints were published in 2022:

- Applications of Nijenhuis Geometry III: Frobenius Pencils and Compatible Non-Homogeneous Poisson Structures
  [OWP-2022-01] Bolsinov, Alexey V.; Konyaev, Andrey Yu.; Matveev, Vladimir S.
- Trivial Source Character Tables of $SL_2(q)$
  [OWP-2022-02] Böhmler, Bernhard; Farrell, Niamh; Lassueur, Caroline
- Some Homological Properties of Borel Type Ideals
  [OWP-2022-03] Herzog, Jürgen; Moradi, Somayeh; Rahimbeigi, Masoomeh; Zhu, Guangjun
- Aeppli-Bott-Chern-Massey Products, Bigraded Notions of Formality, and Non-Zero Degree Maps
  [OWP-2022-04] Milivojević, Aleksandar; Stelzig, Jonas
- Local and Global Canonical Forms for Differential-Algebraic Equations with Symmetries
  [OWP-2022-05] Kunkel, Peter; Mehrmann, Volker
- Characterization of Tropical Planar Curves up to Genus Six
  [OWP-2022-06] Tewari, Ayush Kumar

- Deciding Non-Freeness of Rational Möbius Groups
  [OWP-2022-07] Detinko, Alla; Flannery, Dane; Hulpke, Alexander
- Coorbit Spaces and Dual Molecules: the Quasi-Banach Case
  [OWP-2022-08] Van Velthoven, Jordy Timo; Voigtlaender, Felix
- Bounded Weight Modules for Basic Classical Lie Superalgebras at Infinity
  [OWP-2022-09] Grantcharov, Dimitar; Penkov, Ivan; Serganova, Vera
- Discretization of Inherent ODEs and the Geometric Integration of DAEs with Symmetries
  [OWP-2022-10] Kunkel, Peter; Mehrmann, Volker
- On the Enumeration of Finite L-Algebras
  [OWP-2022-11] Dietzel, Carsten; Menchón, Paula; Vendramin, Leandro
- Shock-avoiding Slicing Conditions: Tests and Calibrations
  [OWP-2022-12] Baumgarte, Thomas W.; Hilditch, David
- Embedding Spaces of Split Links
  [OWP-2022-13] Boyd, Rachael; Bregman, Corey
- On a Conjecture of Khoroshkin and Tolstoy
  [OWP-2022-14] Appel, Andrea; Gautam, Sachin; Wendlandt, Curtis
- Convergence and Error Analysis of Compressible Fluid Flows with Random Data: Monte Carlo Method
  [OWP-2022-15] Feireisl, Eduard; Lukáčova-Medviďová, Mariá; She, Bangwei; Yuan, Yuhuan
- Root Cycles in Coxeter Groups
  [OWP-2022-16] Hart, Sarah; Kelsey, Veronica; Rowley, Peter
- Birational Rowmotion on a Rectangle over a Noncommutative Ring
  [OWP-2022-17] Grinberg, Darij; Roby, Tom
- Quasi-Equilibria and Click Times for a Variant of Muller's Ratchet
  [OWP-2022-18] González Casanova, Adrian; Smadi, Charline; Wakolbinger, Anton
- Hutchinson's Intervals and Entire Functions from the Laguerre-Pólya Class
  [OWP-2022-19] Nguyen, Thu Hien; Vishnyakova, Anna
- Convolution in Dual Cesàro Sequence Spaces
  [OWP-2022-20] Curbera, Guillermo P.; Ricker, Werner J.

Schnappschüsse moderner Mathematik aus Oberwolfach

In den „Schnappschüssen moderner Mathematik aus Oberwolfach" bereiten Teilnehmerinnen und Teilnehmer der wissenschaftlichen Programme des MFO einen besonders spannenden Aspekt ihrer Forschung für die interessierte Öffentlichkeit auf. Im Jahr 2022 sind insgesamt 13 Schnappschüsse aus unterschiedlichen mathematischen Gebieten erschienen:

Snapshots of modern mathematics from Oberwolfach

In the "snapshots of modern mathematics from Oberwolfach" participants of the scientific programs at the MFO explain an especially exciting aspect of their research to an interested public. 13 snapshots from distinct mathematical areas have been published in 2022:

- Emergence in biology and social sciences
  (No. 1/2022) Hoffmann, Franca; Merino-Aceituno, Sara
- The Robinson–Schensted algorithm
  (No. 2/2022) Thomas, Hugh
- Searching for the monster in the trees
  (No. 3/2022) Craven, David A.

- Seeing through rock with help from optimal transport
(No. 4/2022) Frederick, Christina; Yang, Yunan
- Jewellery from tessellations of hyperbolic space
(No. 5/2022) Gangl, Herbert
- Solving inverse problems with Bayes' theorem
(No. 6/2022) Latz, Jonas; Sprungk, Björn
- Representations and degenerations
(No. 7/2022) Dumanski, Ilya; Kiritchenko, Valentina
- Biological shape analysis with geometric statistics and learning
(No. 8/2022) Utpala, Saiteja; Miolane, Nina
- What is pattern?
(No. 9/2022) Baake, Michael; Grimm, Uwe; Moody, Robert V.
- A tale of three curves
(No. 10/2022) Balakrishnan, Jennifer S.
- Characterizations of intrinsic volumes on convex bodies and convex functions
(No. 11/2022) Mussnig, Fabian
- Route planning for bacteria
(No. 12/2022) Hellmuth, Kathrin; Klingenberg, Christian
- Closed geodesics on surfaces
(No. 13/2022) Dozier, Benjamin

3. Infrastruktur und Finanzen

3.1. Übersicht der Bereiche

Die wissenschaftliche Arbeit der Forschungsgäste wird durch eine effiziente Infrastruktur ermöglicht.

Von besonderer Bedeutung ist 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 Gästen rund um die Uhr zur Verfügung.

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

Zur Planung, Durchführung und Begleitung der wissenschaftlichen Programme waren am Institut etwa 23 Stellen in den Bereichen der wissenschaftlichen und allgemeinen Verwaltung, Bibliothek, IT-Abteilung, Öffentlichkeitsarbeit, Gästebetreuung und Hauswirtschaft besetzt. Für die effiziente, konzentrierte Arbeit der Gäste 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.

3.2 Bibliothek

Die Bibliothek des MFO ist für die Forschungsgäste in Oberwolfach das wichtigste Arbeitsmittel. Sie wird intensiv von Teilnehmenden aller Programme genutzt. Viele ziehen eine Einladung nach Oberwolfach anderen Einladungen vor, da sie am MFO Literatur vorfinden, die für sie sonst nicht zugänglich ist. Neben dem hohen internationalen Standard des wissenschaftlichen Programms und den exzellenten Rahmenbedingungen für den persönlichen Gedankenaustausch ist die Bibliothek ein wichtiger Grund für das hohe Ansehen des MFO weltweit.

Der hohe Stellenwert der Bibliothek wird auch deutlich in dem großen Engagement verschiedener Stiftungen wie der Klaus Tschira Stiftung gGmbH, der Marga und Kurt Möllegaard-Stiftung, der VolkswagenStiftung sowie der Carl Friedrich von Siemens Stiftung. So haben die Klaus Tschira

3. Facilities and Finances

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 23 positions in various divisions, such as scientific and administration management, library, IT-service, outreach and media, 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.

3.2 Library

The library is the most important working tool for scientific research in Oberwolfach. It is used intensively by participants of all scientific programs. Many mathematicians prefer an invitation to Oberwolfach to other invitations because they find literature here that is otherwise unavailable for them. In addition to the high international standard of the scientific program and the excellent conditions for the face-to-face exchange of ideas, the library is an important factor for the high reputation of the MFO worldwide.

The high significance of the library is also reflected in the great commitment of various foundations, such as the Klaus Tschira Stiftung gGmbH, the Marga and Kurt Möllegaard-Foundation, the Volkswagen Foundation and the Carl Friedrich von Siemens Foundation. For example,

Stiftung und die VolkswagenStiftung zu gleichen Teilen den Erweiterungsbau der Oberwolfacher Bibliothek finanziert und damit Platz für etwa 20 weitere Jahre geschaffen. Die Carl Friedrich von Siemens Stiftung unterstützt die Oberwolfacher Bibliothek seit 1999 mit einem regelmäßigen Betrag für den Erwerb von Büchern. In 2015-2016 konnte durch Mittel der VolkswagenStiftung die Informations- und Kommunikations-Infrastruktur der Bibliothek modernisiert und eine Kompaktanlage für die gebundenen Zeitschriften eingerichtet werden. Darüber hinaus hat die Deutsche Forschungsgemeinschaft (DFG) seit 2004 zahlreiche Projekte im Rahmen des Förderprogramms „Wissenschaftliche Literaturversorgungs- und Informationssysteme" finanziert.

the Klaus Tschira Stiftung and the Volkswagen Foundation have funded the extension of the library building in equal parts, creating space for another 20 years. The Carl Friedrich von Siemens Foundation has supported the Oberwolfach library since 1999 with a regular amount for the purchase of books. In 2015-2016 the MFO received support from the Volkswagen Foundation to modernize the library infrastructure of information and communication and to install compact shelves for the bound journal volumes. In addition, since 2004, the Deutsche Forschungsgemeinschaft (German Research Foundation, DFG) has financed numerous projects within the funding program "Scientific Library Services and Information Systems".

Bibliotheksprofil

Die Oberwolfacher Bibliothek hat die Aufgabe, die Fachliteratur aus allen Bereichen der Mathematik sowie aus angrenzenden Gebieten so vollständig wie möglich zu erwerben und bereit zu stellen. Im Fokus stehen dabei insbesondere mathematische Fachzeitschriften sowie Monographien und Kongressberichte der relevanten Fachverlage. Schwerpunktmäßig werden Bücher in gedruckter Form angeschafft, Zeitschriften hingegen bevorzugt elektronisch. Aber auch E-Books werden seit 2014 gezielt und in Ergänzung zum gedruckten Bestand erworben. Die relevante Literatur wird gekauft, im Tausch gegen institutseigene Publikationen erworben oder als Geschenk empfangen.

Library profile

The task of the library in Oberwolfach is to acquire and to provide specialist literature from all fields of mathematics and its neighboring areas as complete as possible. In particular, the acquisition focuses on mathematical journals and monographs as well as on conference proceedings of the relevant academic publishers. Books are primarily acquired in printed form, while journals are preferred electronically. However, since 2014 e-books have also been sytematically acquired in addition to the printed stock. The relevant literature is either purchased, acquired in exchange for publications of the Institute, or received as a gift.

Die Bibliothek des MFO ist eine reine Präsenzbibliothek und für die Forschungsgäste rund um die Uhr geöffnet. Sämtliche Bestände stehen innerhalb der Bibliothek ohne Einschränkung zur Verfügung. Es findet keinerlei Ausleihe statt, auch Fernleihe ist nur in begründeten Einzelfällen möglich (z.B. bei Alleinbesitz).

The library of the MFO is a reference library and can be used by our research guests 24 hours a day. The complete collection is available within the library without restriction. There is no lending system, interlibrary lends are only possible in justified individual cases (e.g. in the case of exclusive possession).

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.

Bestand

Zum Bestand der Bibliothek gehörten in 2022 ca. 70.200 gedruckte Bücher, davon 49.800 Monographien und 10.100 Kongressberichte. Die Zahl der E-Books konnte auf etwa 28.500 gesteigert werden. Vor allem durch DFG-Nationallizenzen sowie die DEAL-Verträge und weitere

Library Holdings

The library's collection at the end of 2022 included approximately 70,200 printed books, including 49,800 monographs and 10,100 congress proceedings. The number of e-books has increased to about 28,500. Mainly through DFG National Licences as well as the DEAL contracts and other

Konsortiallizenzen stehen am MFO fast 10.000 E-Journals zur Verfügung. Die Zahl Print-Abonnements ist zurückgegangen auf 150 Titel. In den Kompaktregalen befanden sich darüberhinaus ca. 33.000 gedruckte Zeitschriftenbände, nicht alles davon ist digital erhältlich.

Fernzugriff via HAN

Seit April 2021 konnten wir den Forschungsgästen Fernzugriff auf einige vom MFO lizenzierte Inhalte anbieten. Seit Herbst 2022 ist es nun möglich, mit Hilfe der Software „HAN – Hidden Automatic Navigator" auf sämtliche am MFO lizenzierte eBooks und eJournals von außerhalb des MFO zuzugreifen. Damit konnte dieser Service noch einmal erheblich erweitert und verbessert werden.

Der Fernzugriff ist beschränkt auf die Dauer des geplanten Aufenthaltes am MFO, zuzüglich einer Woche im Voraus sowie zwei Wochen nach Beendigung eines Workshops oder eines Langzeit-Aufenthaltes.

Buchausstellung

Die ständige Buchausstellung gibt interessierten wissenschaftlichen Verlagen die Möglichkeit, ihre Neuerscheinungen im Bereich Mathematik am MFO über einen längeren Zeitraum zu präsentieren. Die Bibliothek des MFO profitiert von dieser Kooperation, indem sie die kostenlos gelieferten Neuerscheinungen in ihren Bestand integrieren kann. 2022 gingen insgesamt 697 Bücher im Rahmen der Buchausstellung in den Bibliotheksbestand ein. Wir danken den folgenden Verlagen für ihre Unterstützung und ihr Mitwirken in unserem Buchausstellungsprogramm:

- American Mathematical Society (AMS)
- Atlantis Press (Co-publishing with Springer)
- Birkhäuser Science
- Cambridge University Press
- CRC Press/Taylor & Francis Group
- De Gruyter GmbH & Co. KG
- EMS Press/EMS Publishing House
- International Press of Boston, Inc.
- Iwanami Shoten Publishers
- Mathematical Society of Japan
- Oxford University Press
- Princeton University Press

consortia licences, almost 10,000 e-journals are available at the MFO. The number of print subscriptions has decreased to 150 titles. Additionally, the compact shelves of the library contain about 33,000 bound journal volumes, where not all of them are also electronically available.

Remote access via HAN

Since April 2021, we have been able to offer research guests remote access to some MFO licensed content. Since fall 2022, it is now possible to access all electronic eBooks and eJournals licensed at the MFO from outside the MFO using the software "HAN – Hidden Automatic Navigator". Thus, this service could once again be significantly expanded and improved.

Remote access to licensed content is limited to the duration of participation in one of the Oberwolfach research programs plus one week prior to the start date and two weeks after the end of a workshop or long-term stay.

Book exhibition

The permanent book exhibition enables academic publishers to present their new publications in the field of mathematics at the MFO for a certain period of time. The library of the MFO benefits from this cooperation, because all books from the exhibition can be included free of charge into the inventory of the library. In the year 2022 the library received a total of 697 books this way. We wish to thank the following publishers for taking part in our book exhibition program:

- Société Mathématique de France (SMF)
- Springer Nature
- Springer Spektrum
- XYZ Press by AwesomeMath (distributed by AMS)

Oberwolfach Photo Collection

Zum Bibliotheksbestand gehört eine umfangreiche Sammlung an Porträts von Mathematikern und Mathematikerinnen, 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 zugrunde liegende Datenbank ist eine Eigenentwicklung des MFO. Die Sammlung wird laufend ergänzt durch eigene Aufnahmen sowie durch externe Beiträge. Sie wird unter anderem für den Bereich Mathematik in der Wikipedia unter den Bedingungen der Creative Commons License Attribution-Share Alike 2.0 Germany sowie in zunehmendem Maße von Verlagen für deren Publikationen genutzt. Ende 2022 waren ca. 22.910 Fotos in der Datenbank enthalten.

Oberwolfach Photo Collection

The inventory of the library includes a large collection of mathematician portraits, collected by Prof. Dr. Konrad Jacobs, Erlangen. This collection has been digitized in the year 2004 with support of the publisher Springer Heidelberg. It is freely available on the internet with a variety of search functions. The underlying database is an in-house development of the MFO. The collection is continuously supplemented by in-house photographs and contributions by mathematicians worldwide. Among other things, the collection is used for the field of mathematics in Wikipedia according to the conditions of the Creative Commons License Attribution-Share Alike 2.0 Germany. Increasingly, publishers use the collection as well for their publications. By the end of 2022 the database contained approximately 22,910 photos.

3.3. IT

Die IT-Abteilung des MFO stellt den Institutsangehörigen, den Gremien und den Gästen effiziente IT-Arbeitsumgebungen zur Verfügung. Sie unterstützt die Bibliothek und den Bereich der Öffentlichkeitsarbeit bei Diensten für die mathematische Community und die interessierte Öffentlichkeit. Dabei sind Informationssicherheit und Datenschutz wichtige Aspekte, die entsprechend berücksichtigt werden.

Seit Ende des Jahres 2022 wird die IT-Abteilung des MFO von einem externen Unternehmen unterstützt, insbesondere im Hinblick auf die Informationssicherheit. Die Zusammenarbeit hilft dem Institut dabei, einen seit Beginn des Jahres 2022 bestehenden Personalengpass in der IT abzufedern.

Verwaltungsbereich

Die Verwaltung der Tagungen und der längeren Forschungsaufenthalte erfolgt mit der am MFO entwickelten Software „owconf", die Anforderungen von wissenschaftlicher Begutachtung, Konferenzmanagement und Hotelsoftware in sich vereinigt. Neuerungen im wissenschaftlichen Programm sowie pandemiebedingte Anforderungen in der Tagungsverwaltung erforderten auch 2022 eine Weiterentwicklung der Software.

3.3. IT

The IT department of the MFO provides an efficient IT infrastructure for the employees of the Institute, the committees, and the visiting scientists. Furthermore, the IT department supports the library and the public relations of the MFO with regard to services for the mathematical community and the interested public. Data security and data protection are important tasks, taken into account throughout.

Since the end of 2022, the IT department of the MFO has been supported by an external company, in particular with regard to data security. The collaboration helps the Institute cushion a personnel shortage that has existed since the beginning of 2022.

Administrative sector

The databased software "owconf", developed in-house, handles all tasks arising from scientific management, conference management and guesthouse administration. In 2022, enhancements were necessary due to the innovations in the scientific program and the changing requirements in conference administration related to the pandemic.

Kommerzielle Software wird in den Bereichen Finanzbuchhaltung, Personalverwaltung sowie beim Bibliothekskatalog und der Literaturrecherche eingesetzt.

Commercial software is used for financial accounting and human resources, for the library catalog and the literature search portal.

Das Verwaltungspersonal arbeitet hauptsächlich mit Remote-Desktop-Sitzungen, die von den PC-Arbeitsplätzen oder per VPN von mobilen Arbeitsplätzen aus genutzt werden.

The administrative staff mainly works with remote desktop sessions, which are accessed from the PC workstations or from mobile workstations via VPN.

Gästebereich

Wegen der relativ kurzen Aufenthalte der Gäste sind alle IT-Angebote so intuitiv wie möglich gestaltet. Die Gäste erhalten persönliche Nutzerkonten, drahtlosen und kabelgebundenen Internetzugang sowie Scan- und Druckmöglichkeiten. Terminal-Server-Arbeitsplätze bieten neben den üblichen Office-Anwendungen Zugriff auf einen Compute-Server mit Maple, Mathematica, Magma sowie einer Vielzahl freier mathematischer Software.

Guests' working environments

Due to the relatively short stays of the guest scientists, all services are designed as easy to use as possible. Guest scientists are provided with personal accounts, wifi and cable-bound ethernet connection as well as scan and print facilities. Terminal Server workplaces offer the usual office tools together with access to a compute server with Maple, Mathematica, Magma and a range of free mathematical software.

Alle Vortragsräume sind mit moderner Präsentations- und Videokonferenztechnik augestattet. Hochwertige Deckenmikrofone, Matrixmischer und sehr gute Lautsprecher sorgen auch bei der Kommunikation zwischen größeren Gruppen für eine hervorragende Tonqualität. Eine Trackingkamera schwenkt automatisch auf den korrekten Bildausschnitt wenn sich die vortragende Person von einer Tafel zur nächsten bewegt. Alle wichtigen Funktionen zur Steuerung der Kamera, des Audiosystems sowie sonstiger Peripheriegeräte stehen den Videokonferenzassistenten auf einem übersichtlichen Tastenfeld zur Verfügung. Auch für Kleingruppen und Einzelpersonen in den Langzeitprogrammen des MFO stehen Videokonferenzsysteme zur Verfügung.

The IT section maintains modern presentation and videoconference equipment in all lecture rooms. High-quality ceiling microphones, matrix mixers and very good loudspeakers ensure excellent sound quality even in the communication of larger groups. A tracking camera automatically pans to the correct section when the lecturer moves from one blackboard to the next. The important functions for controlling the camera, the audio system and other peripheral devices are available to the video conference assistant on an easy-to-use keypad. Video conference systems are also available for small groups and individuals in the long-term programs of the MFO for exchange with distant cooperation partners.

Webdienste

Die Webdienste für die Gäste und die weitere mathematische Community bieten Informationen über die Angebote des MFO, künftige und vergangene Forschungsprogramme und – in Zusammenarbeit mit der Bibliothek – freien Zugang zu Publikationen des Instituts. Der spezielle Webdienst „Oberwolfach Photo Collection" ist eine Eigenentwicklung des MFO.

Web services

Web services for the guest scientists and the wider mathematical community include information about MFO facilities, future and past research programs at the MFO and open access to publications of the Institute in collaboration with the MFO library. The special web service "Oberwolfach Photo Collection" has been developed in-house.

Unterstützung der Öffentlichkeitsarbeit

Die IT-Abteilung unterstützt die Öffentlichkeitsarbeit des MFO, insbesondere die „Schnappschüsse moderner Mathematik aus Oberwolfach", für deren Produktion sie die Infrastruktur bereitstellt. Außerdem betreut die IT des MFO das Oberwolfacher Museum für Mineralien und Mathematik „MiMa". Dieses wird von der Gemeinde Oberwolfach, dem Verein der Freunde

Support of outreach activities

The IT section also supports the outreach activities of the MFO, in particular it supplies the infrastructure for producing the "snapshots of modern mathematics from Oberwolfach". Moreover, the IT section services the Museum for Minerals and Mathematics "MiMa". It is run jointly by the local authority, the association of the Friends of Minerals and Mining and the MFO

von Mineralien und Bergbau Oberwolfach und dem MFO gemeinsam betrieben (s. Abschnitt 3.4.: Öffentlichkeitsarbeit). Ausgewählte Exponate werden auch direkt am Institut den Forschungsgästen über einen Touchscreen bereitgestellt.

3.4. Öffentlichkeitsarbeit

Das MFO richtet sich in seiner Öffentlichkeitsarbeit sowohl an wissenschaftliche als auch an nicht-wissenschaftliche Zielgruppen. Die wissenschaftliche Kernzielgruppe, bestehend aus Mathematikern und Mathematikerinnen sowie Forschenden in angrenzenden Gebieten, erhält regelmäßig Informationen über anstehende Veranstaltungen und wissenschaftliche Programme des MFO. Das MFO verschickt dazu einen halbjährlichen Rundbrief per Email, informiert auf der eigenen Webseite und verbreitet Flyer und Poster. Außerdem nutzt das Institut die angebotenen Informationskanäle der mathematischen Fachgesellschaften, z.B. von DMV und EMS.

Zusätzlich zur wissenschaftlichen Kernzielgruppe richtet sich das MFO an im weiteren Sinne forschungsinteressierte Gruppen, insbesondere an Schülerinnen und Schüler, Studierende, Lehrkräfte und Wissenschaftsredaktionen, sowie an die breite Öffentlichkeit. Das Ziel ist es, das Verständnis für die Bedeutung der Mathematik und der modernen mathematischen Forschung zu fördern. Das MFO verfolgt dazu drei miteinander vernetzte Aktivitäten: Das Institut ist Mitbetreiber des Museums für Mineralien und Mathematik in Oberwolfach, es ist Herausgeber der Open-Source Schriftenreihe „Schnappschüsse moderner Mathematik aus Oberwolfach" und es ist Teilhaber und Kooperationspartner der IMAGINARY gGmbH.

Mathematik im MiMa

Das Mathematische Forschungsinstitut Oberwolfach betreibt seit 2010 gemeinsam mit dem Verein der Freunde von Mineralien und Bergbau und der Gemeinde Oberwolfach das MiMa – Museum für Mineralien und Mathematik. Das Museum zeigt eine einzigartige Sammlung an Mineralien aus dem gesamten Schwarzwald und erklärt ihre kristallinen Formen und Symmetrien in interaktiven mathematischen Installationen.

Der mathematische Teil der Ausstellung bietet kunstvolle Einblicke in die Mathematik und lädt dazu ein, mathematische Phänomene spielerisch zu erforschen. Sowohl Konzepte der angewandten als auch der reinen Mathematik werden in interaktiven Programmen, Hands-on-Exponaten und Bildern dargestellt. Ein deutlicher

– all seated at Oberwolfach (see section 3.4.: Outreach and Media). Selected exhibits are also provided to our research guests at the Institute on a touchscreen.

3.4. Outreach and Media

In its outreach the MFO addresses both academic and non-academic target groups. The core academic target group, consisting of mathematicians and researchers in adjacent areas, regularly receives information on forthcoming events and scientific programs of the MFO. The MFO sends a biannual newsletter via email, informs on its website and distributes posters and flyers. The Institute also uses the information channels offered by national and international mathematical societies, e.g. of the German Mathematical Society (DMV) and the European Mathematical Society (EMS).

In addition to the core academic target group, the MFO addresses groups interested in research in a broader sense, in particular pupils, students, teachers and science journalists, as well as the general public. The main objective with regard to these audiences is to promote the understanding of the importance of mathematics and modern mathematical research. The MFO pursues three interlinked activities: The Institute is co-operator of the Museum of Minerals and Mathematics in Oberwolfach, it is the publisher of the open-source article series "snapshots of modern mathematics from Oberwolfach" and it is shareholder and cooperation partner of the IMAGINARY gGmbH.

Mathematics at the MiMa

Since 2010 the Mathematisches Forschungsinstitut Oberwolfach engages in the MiMa – Museum for Minerals and Mathematics, together with the association of the Friends of Minerals and Mining in Oberwolfach and the municipality Oberwolfach. The museum shows a one-of-a-kind collection of minerals from all over the Black Forest and explains their forms and symmetries with interactive mathematical applications.

The maths exhibition delivers aesthetic insights into mathematics and enables visitors to playfully explore mathematical phenomenons. Interactive programs, hands-on exhibits, and images depict concepts of both applied and pure mathematics. A clear focus is put on the mathematical foundations of crystallography. Through this

Schwerpunkt liegt auf den mathematischen Grundlagen der Kristallografie. Durch die Verknüpfung von Mathematik und Mineralogie bietet das Museum einen interdisziplinären Zugang zu beiden Wissenschaften und vereint zwei Besonderheiten der Region unter einem Dach.

combination of mathematics and mineralogy, the museum offers an interdisciplinary approach to both sciences and presents two unique features of the region in one single spot.

Die Ausstellung richtet sich an ein breites Publikum. Ein besonderer Schwerpunkt liegt auf den Schulen der Region, für die spezielle Führungen angeboten werden. Im Rahmen der Reihe „Kultur im MiMa" finden außerdem Veranstaltungen zu unterschiedlichen Themen aus Mathematik und Mineralogie statt.

The exhibition is aimed at a broad audience. A special focus is on the schools of the region, for which special tours are offered. Within the "Culture in MiMa" series, there are also events on various topics from mathematics and mineralogy.

Nach zwei Jahren der Pandemie mit längeren Schließzeiten stiegen die Besucherzahlen in diesem Jahr wieder an. Etwa 4.700 Personen besuchten 2022 das MiMa.

After two years of the pandemic with longer closure times, visitor numbers increased again this year. Around 4,700 people visited the MiMa in 2022.

Schnappschüsse moderner Mathematik

Das Ziel der „Schnappschüsse moderner Mathematik aus Oberwolfach" ist es, mathematische Ideen und Probleme in verständlicher Art und Weise einem breiten Publikum zu vermitteln. Sie sollen spannende Einblicke in die aktuelle mathematische Forschung bieten. Die Schnappschüsse werden von Teilnehmenden des wissenschaftlichen Programms am MFO geschrieben. Ein Team aus Editorinnen und Editoren unterstützt sie bei der Aufbereitung der komplizierten Sachverhalte für ein breites Publikum. Das MFO veröffentlicht die Schnappschüsse frei verfügbar unter einer Creative Commons Lizenz.

Snapshots of modern mathematics

The aim of the "snapshots of modern mathematics from Oberwolfach" is to explain mathematical problems and ideas in an understandable way to a broad audience. They shall provide exiting insights into current mathematical research. The snapshots are written by participants of the scientific program at the MFO. A team of editors assists them in communicating complicated matters to a broad audience. The MFO publishes the snapshots for free download under a Creative Commons license.

Das Schnappschuss-Projekt hat zum Ziel, Verständnis und Wertschätzung für moderne Mathematik und mathematische Forschung in der interessierten Öffentlichkeit weltweit zu fördern. Die angestrebte Leserschaft besteht aus Mathematiklehrkräften, Wissenschaftsjournalistinnen und -journalisten, Studierenden sowie fortgeschrittenen Schülerinnen und Schülern.

The snapshot project is designed to promote the understanding and appreciation of modern mathematics and mathematical research in the interested public world-wide. The targeted readership consists of mathematics teachers, science journalists, undergraduate and advanced high school students.

Das Projekt wurde 2022 von Dr. Anja Randecker koordiniert. Sie ist als Chefeditorin für das Editieren der Texte verantwortlich. In diesem Jahr haben Dr. Michela Egidi, Dr. Carina Geldhauser, Dr. Kelsey Houston-Edwards, Dr. Jan Kohlrus, Daniel Kronberg, Dr. Marta Maggioni, Dr. Sara Munday, Anup Anand Singh, Dr. Matthew Tam und Joonas Mikael Vättö Schnappschüsse editiert. Im Laufe des Jahres wurden 13 Schnappschüsse publiziert (s. Abschnitt 2.11.: Publikationen).

In 2022 the project was coordinated by Dr. Anja Randecker. As senior editor she is responsible for the editing process of the snapshots. Dr. Michela Egidi, Dr. Carina Geldhauser, Dr. Kelsey Houston-Edwards, Dr. Jan Kohlrus, Daniel Kronberg, Dr. Marta Maggioni, Dr. Sara Munday, Anup Anand Singh, Dr. Matthew Tam and Joonas Mikael Vättö worked as junior editors. 13 snapshots were published in this year (see section 2.11.: Publications).

Um die Bekanntheit des Projekts zu erhöhen wurden die Snapshots im August 2022 auf der MATRIX x IMAGINARY Konferenz am Institut Henri Poincaré in Paris präsentiert. Anja

In order to increase awareness for the project, the snapshots were presented in August 2022 at the MATRIX x IMAGINARY conference at the Institut Henri Poincaré in Paris. Anja Randecker

Randecker hielt dort einen Vortrag und stellte das Projekt auf dem Math Bazaar vor. Zu diesem Anlass richtete das MFO eine mobile Snapshots-Station ein, basierend auf dem Programm „Snapshot-Slider" von IMAGINARY. Die Station kann auch für weitere Messeauftritte genutzt werden. Für die Präsentation in Paris wurden außerdem erstmals zwei Snapshots auf Französisch übersetzt, die im Anschluss an die Konferenz veröfffentlicht wurden.

gave a talk and presented the project at the Math Bazaar. For this occasion, the MFO set up a mobile snapshots station based on IMAGINARY's "Snapshot Slider" program. The station can now be used for further fairs and exhibitions. For the presentation in Paris, two snapshots were translated into French for the first time and were published after the conference.

Zusammenarbeit mit IMAGINARY

IMAGINARY startete am MFO anlässlich des Wissenschaftsjahres der Mathematik 2008 als interaktive Wanderausstellung und entwickelte sich über die Jahre zu einer Online-Plattform für interaktive Mathematik-Vermittlung. Seit 2016 ist IMAGINARY eine selbständige gemeinnützige GmbH mit einem breiten Spektrum an Dienstleistungen in der Mathematikkommunikation. Das MFO ist Teilhaber der Gesellschaft und kooperiert mit IMAGINARY im Bereich seiner Öffentlichkeitsarbeit, insbesondere bei den Schnappschüssen und dem MiMa. Beide Projekte gingen als Teilprojekte aus IMAGINARY hervor und sind heute noch am MFO angesiedelt. Im MiMa unterstützt IMAGINARY das MFO bei der Auswahl und Implementierung neuer Exponate. Die Schnappschüsse werden maßgeblich über die IMAGINARY-Plattform verbreitet sowie auf vielen IMAGINARY-Ausstellungen in der interaktiven Station „Snapshot-Slider" gezeigt und zum Ausdrucken oder Verschicken angeboten.

Cooperation with IMAGINARY

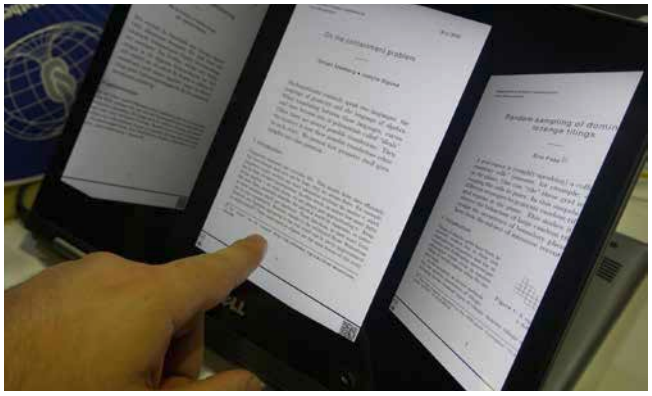
IMAGINARY started at the MFO on the occasion of the science year of mathematics in 2008 as an interactive traveling exhibition and developed over the years to an online platform for interactive mathematics communication. In 2016 IMAGINARY became an independent non-profit company (gGmbH) offering a wide range of services in mathematics communication. The MFO is a shareholder of the company and cooperates with it within the scope of public relations – in particular, with regard to the snapshots and the MiMa. Both projects were once founded as subprojects of IMAGINARY and are continued by the MFO. With regard to the MiMa, IMAGINARY supports the MFO in the selection and implementation of new exhibits. The snapshots are largely distributed via the IMAGINARY platform. They are also presented at many IMAGINARY exhibitions in the interactive "Snapshot-Slider" and offered for printing or mailing.

Weitere Projekte

2022 konnte außerdem die Festschrift zum 75-jährigen Jubiläum des Instituts fertiggestellt und veröffentlicht werden. Sie umfasst neben den Grußworten von Freunden und Förderern des MFO auch ein Transkript des Festvortrags von Stefan Müller (Bonn) sowie einen Artikel des Mathematik- und Wissenschaftshistorikers Volker Remmert (Wuppertal) über die Rolle von Szolem Mandelbroijt und John Todd für den Erhalt des Instituts nach dem Zweiten Weltkrieg.

Further projects

In 2022, the publication for the 75th anniversary of the Institute (Festschrift) was completed and published. In addition to the greetings from friends and supporters of the MFO it includes a transcript of the lecture given at the anniversary celebration by Stefan Müller (Bonn) and an article by the mathematics and science historian Volker Remmert (Wuppertal) about the role of Szolem Mandelbroijt and John Todd for the maintenance of the Institute after World War II.



Snapshot-Slider (Photo: IMAGINARY)

Festschrift

3.5. 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.

Das Tagungsgebäude liegt dem Gästehaus direkt gegenüber und wurde 1975 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 Gästen doch rund um die Uhr die Möglichkeit zu kreativer Arbeit, was intensiv genutzt wird. Im Frühjahr 2010 wurde die Sanierung des Gästehauses abgeschlossen.

Der Verwaltungsbereich umfasst derzeit 10,85 besetzte Stellen für die wissenschaftliche Verwaltung (Organisation der Workshops, Öffentlichkeitsarbeit, Drittmittelprojekte), die Bibliothek, die IT sowie für die allgemeine Verwaltung (Finanzverwaltung, Beschaffungswesen, 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 der Programme Oberwolfach Research Fellows und Oberwolfach Leibniz Fellows möglich. Der Hauswirtschaftsbereich umfasst insgesamt 13,75 Stellen für Küche und Zimmerservice sowie für die Pflege von Gebäuden und Grundstück (davon waren 2022 11,1 Stellen besetzt).

3.5. Administration and housekeeping

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

The library building is located immediately opposite the guest house and was built with funds from the Volkswagen Foundation in 1975. 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 Volkswagen Foundation 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.

The administration encompasses at the moment 10.85 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, 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 program at the MFO. The guest house was built with funds from the Volkswagen Foundation 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 programs Oberwolfach Research Fellows and Oberwolfach Leibniz Fellows. The housekeeping department comprises 13,75 positions for kitchen and room service as well as for the maintenance of the buildings and premises (11.1 positions staffed in 2022).

3.6. Finanzielle Übersicht

Erlöse 2022	
(gerundet auf 1.000 €)	
Zuwendung Bund/Länder	3.414.000
Selbstbewirtschaftungsmittel aus 2021	77.000
Drittmittel	240.000
Spenden	100.000
Sonstige Einnahmen	130.000
Zweckgebundene Reste aus 2021	536.000
Summe Erlöse	**4.497.000**

Aufwendungen 2022	
(gerundet auf 1.000 €)	
Personalausgaben	1.849.000
Materialaufwand	342.000
Aufwand für bezogene Leistungen	238.000
Sonstige Aufwendungen (inklusive Sachausgaben Bibliothek)	1.392.000
Rückstellungen für zweckgebundene Reste	552.000
Investitionen	124.000
Summe Aufwendungen	**4.497.000**

Erläuterungen

Der Anteil von Drittmitteln, Spenden und sonstigen Einnahmen bezogen auf die Gesamtsumme der Erlöse liegt im Haushaltsjahr 2022 bei 12,1%. Die zweckgebundenen Reste und Selbstbewirtschaftungsmittel aus 2021 sind dabei nicht berücksichtigt.

Öffentliche Mittel

Das MFO erhielt im Haushaltsjahr 2022 insgesamt 3,414 Mio. Euro Zuwendung von Bund und Ländern.

Drittmittel

Die projektbezogenen Drittmittel rekrutierten sich im Haushaltsjahr 2022 insbesondere aus Mitteln der National Science Foundation (NSF) der USA, der Simons Foundation und der Carl Friedrich von Siemens Stiftung.

3.6. Financial overview

Revenues 2022	
(rounded to 1,000 €)	
Benefits from the federation/federal states	3.414.000
Benefits from 2021	77.000
Third party funds	240.000
Donations	100.000
Other income	130.000
Earmarked surpluses	536.000
Total revenues:	**4.497.000**

Expenses 2022	
(rounded to 1,000 €)	
Personnel department	1.849.000
Purchases	342.000
Expenses for drawn benefits	238.000
Other expenses (with material expenses for the library)	1.392.000
Provisions for earmarked surpluses	552.000
Investments	124.000
Total expenses:	**4.497.000**

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 12.1%. Funds carried forward from 2021 are disregarded here.

Public funding

In the fiscal year 2022 the MFO received 3.414 million Euro funding from the federation and the federal states.

Third-party funds

Earmarked third party funds in the fiscal year 2022 are mainly composed of the grants from the US National Science Foundation (NSF), the Simons Foundation and the Carl Friedrich von Siemens Foundation.

Förderverein und Oberwolfach Stiftung

Zweckgebundene Spenden erhielt das MFO auch im Haushaltsjahr 2022 vom Förderverein, der Oberwolfach Stiftung und der Carl Friedrich von Siemens Stiftung. Die Gelder wurden für Reisekostenzuschüsse in besonderen Fällen, für die Unterstützung von Kinderbetreuungskosten, die Beschaffung von Büchern in der Bibliothek und als Zuschuss zu Baumaßnahmen verwendet.

Förderverein and Oberwolfach Foundation

Earmarked donations have been received by the Förderverein, the Oberwolfach Foundation, and the Carl Friedrich von Siemens Foundation. These funds have been used to support travel costs for scientists in special cases, for child support, for special literature, and as additional support for building measures.

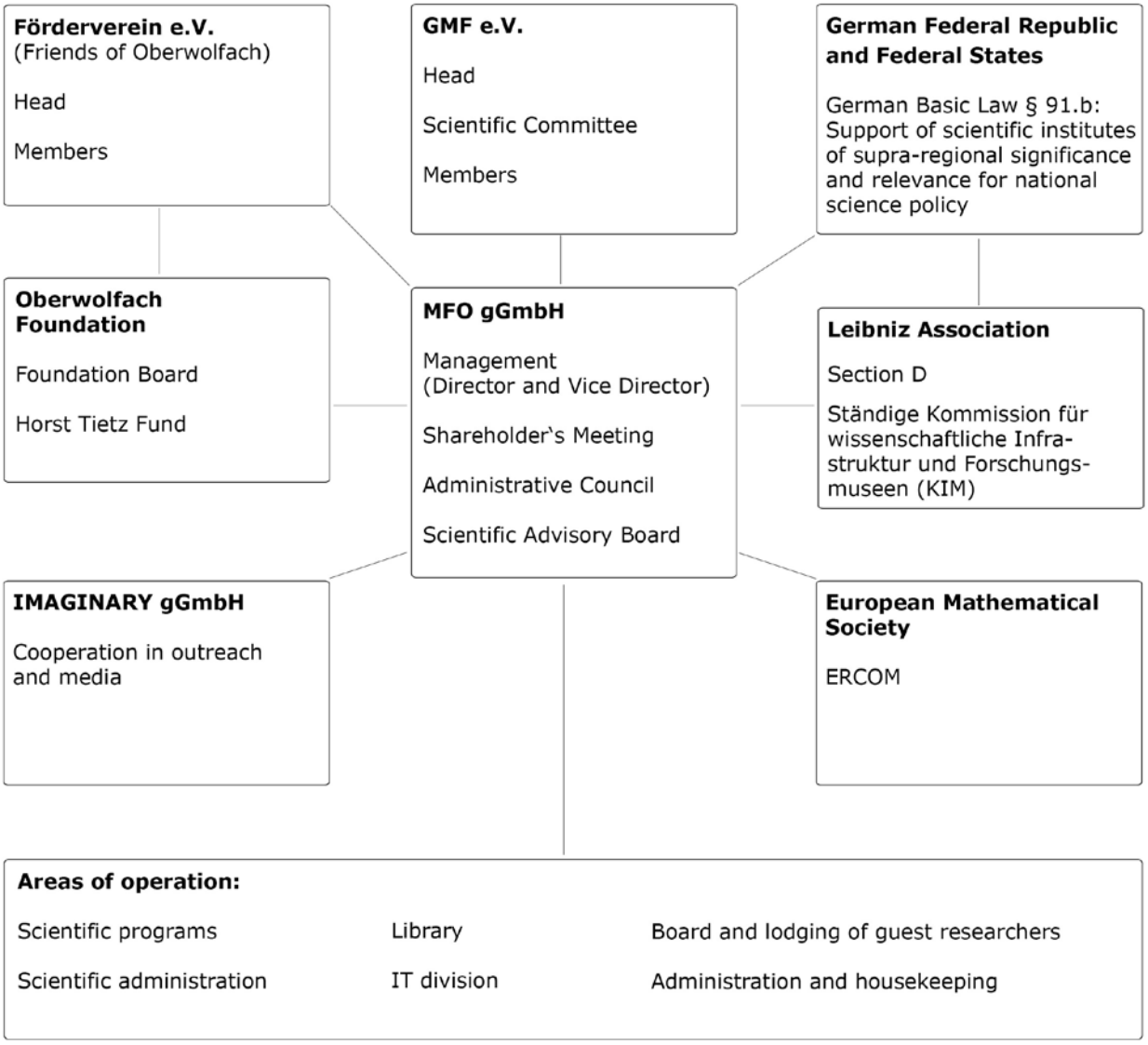
3.7. Dank

Ein besonders herzliches Dankeschön gilt den Zuwendungsgebern (Bund und Länder). Weiter gilt unser Dank allen Drittmittelgebern wie der Carl Friedrich von Siemens Stiftung, der National Science Foundation (NSF) und der Simons Foundation. Ein besonderes Dankeschön gilt natürlich auch dem Förderverein und der Oberwolfach Stiftung für die großzügige Unterstützung des MFO.

3.7. Acknowledgement

A particular thank-you goes to the federation and the federal states for their financial support. We would also like to thank for the third-party funds received from the Carl Friedrich von Siemens Foundation, the National Science Foundation (NSF) and the Simons Foundation. Our special thank-you also goes to the Förderverein and the Oberwolfach Foundation for their important support of the MFO.

3.8. Organigramm



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 Mathematikerinnen und 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 vier institutionellen Mitglieder DMV (Deutsche Mathematiker-Vereinigung), GAMM (Gesellschaft für angewandte Mathematik und Mechanik), EMS (European Mathematical Society) 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 etwa 600 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.

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 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 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 four institutional members, namely DMV (Deutsche Mathematiker-Vereinigung), GAMM (Gesellschaft für angewandte Mathematik und Mechanik), EMS (European Mathematical Society) and the Förderverein. The GMF is the legal owner of the site and of the buildings of the MFO. 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, Friends of Oberwolfach) has about 600 members and provides additional financial support for the MFO by its membership fees. The Oberwolfach Foundation, 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.

Das Institut ist außerdem Gesellschafter der IMAGINARY gGmbH und kooperiert mit dieser im Bereich der Öffentlichkeitsarbeit. IMAGINARY begann als Projekt des MFO im Jahr 2008 und wurde 2016 als selbständiger Dienstleister im Bereich der Mathematik-Kommunikation ausgegründet.

Furthermore the Institute is a shareholder of the IMAGINARY gGmbH and cooperates with the company in the field of public relations. IMAGINARY started in 2008 as a project of the MFO. Since 2016 it is an independent service provider in the field of mathematics communication.

Beschäftigte des MFO — Staff of the MFO — 2022

Wissenschaftliche Verwaltung	**Scientific Administration**	
Direktor	Director	Prof. Dr. Gerhard Huisken
Stellvertretender Direktor	Vice Director	Prof. Dr. Matthias Hieber
Wissenschaftlicher Administrator	Scientific Administrator	apl. Prof. Dr. Stephan Klaus
Wissenschaftliche Mitarbeiterin	Scientific Assistant	Dr. Tatjana Ruf
Sekretärinnen für das wissenschaftliche Programm	Secretaries for the scientific program	Silke Okon, Andrea Schillinger
Verwaltung	**Administration**	
Verwaltungsleitung	Head of Administration	Susanne Riester
Sekretärinnen im Gästebüro	Secretaries in the guest services office	Annette Disch, Petra Lein, Stefanie Reith
Bibliothekarin	Librarian	Verena Franke
Fachangestellte für Medien- und Informationsdienste (FaMI)	Library Assistant	Jennifer Hinneburg
Auszubildende FaMi	Trainee in the library	Ronja Firner
IT	IT	Gerold Glöde, Helmut Kastenholz, Christoph Weber
Hauswirtschaft	**Housekeeping**	
Hauswirtschaftsleiterin	Housekeeping Manager	Charlotte Endres
Hausmeister	Caretaker	Helmut Breithaupt, Anton Herrmann
Weitere Beschäftigte	Further housekeeping staff	ca. 9 full time equivalent

Verwaltungsrat des MFO/Administrative Council of the MFO

(Mitglieder/Members 2022)

Tania Bolius	Ministerium für Wissenschaft, Forschung und Kunst, Stuttgart, (Vorsitzende/Chair)
Jan Neitzke (until 10/2022)/ Jochen Leyendecker (since 10/2022)	Bundesministerium für Bildung und Forschung, Bonn, (stellvertretender Vorsitzender/Vice Chair)
Prof. Dr. Jean-Pierre Bourguignon	IHÉS/Past President of the European Research Council
Dr. Franz Dettenwanger	VolkswagenStiftung, Hannover
Prof. Dr. Friedrich Götze	Fakultät für Mathematik, Universität Bielefeld
Christian Mees	Ministerium für Wirtschaft, Innovation, Digitales und Energie des Saarlandes
Prof. Dr. Felix Otto	Direktor des Max-Planck-Instituts für Mathematik in den Naturwissenschaften, Leipzig
Prof. Dr. Thomas Schick	Universität Göttingen
Beate Spiegel	Geschäftsführerin der Klaus Tschira Stiftung gGmbH, Heidelberg

Wissenschaftlicher Beirat des MFO/Scientific Advisory Board of the MFO

(Mitglieder/Members 2022)

Prof. Dr. Maria Chudnovsky, Princeton
Prof. Dr. Barbara Fantechi, Trieste
Prof. Dr. Annette Huber-Klawitter, Freiburg (vice chair)
Prof. Dr. Bảo Châu Ngô, Chicago/Hanoi
Prof. Dr. Barbara Niethammer, Bonn
Prof. Dr. Thomas Schick, Göttingen (chair)
Prof. Dr. Bernd Sturmfels, Leipzig/Berkeley

Gesellschaft für Mathematische Forschung e.V. (GMF)

Vorstand der GMF/Head of the GMF
(Mitglieder/Members 2022)

Prof. Dr. Friedrich Götze, Bielefeld	Vorstandsvorsitzender der GMF/ Chair of the GMF
Prof. Dr. Felix Otto, Leipzig	Vorsitzender der Wissenschaftlichen Kommission/ Chair of the Scientific Committee
Prof. Dr. Joachim Schwermer, Wien	Schatzmeister/Treasurer

Wissenschaftliche Kommission der GMF/Scientific Committee of the GMF
(Mitglieder/Members 2022)

Prof. Dr. Nalini Anantharaman, Strasbourg
Prof. Dr. Arthur Bartels, Münster
Prof. Dr. Jean Bertoin, Zürich
Prof. Dr. Jean-Benoît Bost, Orsay
Prof. Dr. Sébastien Bouksom, Palaiseau
Prof. Dr. Eric Cancès, Paris
Prof. Dr. Thierry Coquand, Göteborg
Prof. Dr. Alessio Figalli, Zürich
Prof. Dr. Alice Guionnet, Lyon
Prof. Dr. Daniel Huybrechts, Bonn
Prof. Dr. Bernhard Keller, Paris
Prof. Dr. Gitta Kutyniok, München
Prof. Dr. Monique Laurent, Amsterdam
Prof. Dr. Philippe Michel, Lausanne
Prof. Dr. Felix Otto, MIS Leipzig (chair)
Prof. Dr. Markus Reineke, Bochum
Prof. Dr. Eero Saksman, Helsinki
Prof. Dr. Karl-Theodor Sturm, Bonn
Prof. Dr. Benjamin Sudakov, Zürich
Prof. Dr. Andreas Thom, Dresden (vice chair)
Prof. Dr. Corinna Ulcigrai, Zürich
Prof. Dr. Sara van de Geer, Zürich
Prof. Dr. Eva Viehmann, Münster
Prof. Dr. Anna Wienhard, MIS Leipzig
Prof. Dr. Barbara Wolmuth, München