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The 21st ÖMG Congress and the Annual DMV Meeting 2025 in Linz

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Overview

The national meetings of the ÖMG, which are held once every two years, have a history of several decades. The German Mathematical Society (DMV) holds its own national meeting every year. These meetings have an even longer history that can be traced back into the 19th century. Once every four years, the national meetings of the ÖMG and the DMV are held jointly. This tradition was established in 1960, and in the present century, such joint meetings were held in Passau (2021), Salzburg (2017), Innsbruck (2013), Graz (2009), Klagenfurt (2005), and Vienna (2001). In 2025, we have had another joint meeting.

It took place from September 1 to September 5 at the Johannes Kepler University in Linz, where joint ÖMG-DMV meetings had already been held in 1968 and 1993. The 2025 meeting featured a diverse scientific program including plenary lectures, thematic sections, minisymposia, and several satellite events. In total, there were about 500 participants and around 300 talks. The registered participants came from 24 distinct countries, but most of them were from Austria (45%) or Germany (35%).

The scientific committee consisted of the local mathematics faculty in Linz (Evelyn Buckwar, Herbert Egger, Luca Gerado-Giorda, Bert Jüttler, Manuel Kauers, Ronny Ramlau, and Carsten Schneider), three representatives of the ÖMG (Michael Drmota from TU Wien, Barbara Kaltenbacher from Klagenfurt, and Friedrich Pillichshammer from Linz), and three representatives of the DMV (Moritz Kassmann from Bielefeld, Gudrun Thäter from Karlsruhe, and Alexander Zimmermann from Picardie in France). Manuel Kauers served as chair of the committee. He also served as chair of the local arrangements team, which

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besides him included Christoph Koutschan, Friedrich Pillichshammer, and Wolfgang Windsteiger.

The scientific committee selected the plenary speakers, determined the sections, and appointed one organizer for each section. Section organizers were encouraged to pick a co-organizer of their choice, preferably in such a way that each section had one organizer from Austria and one from Germany. The scientific committee also reviewed and decided about the proposals for minisymposia.

Section organizers could decide freely how they composed the program of their section. Some made an open call for contribution in their respective communities, others approached potential speakers directly, and some used a combination of both approaches. Individuals who approached the conference organizers wishing to give a talk but who could not be accommodated in one of the sections had the option to give a talk in the "general section".

The organizers wish to thank all speakers, section and minisymposium organizers, and participants for their contributions, as well as the sponsors and exhibitors for their generous support.

Program

Here we document the key components of the conference program. The complete program including titles and abstracts of all talks is available on the conference homepage

https://www.jku.at/oemg-dmv-2025/

Plenary Lectures

- Marie-Therese Wolfram (University of Warwick)

  From Inverse Optimal Transport to Global Trade

  Optimal transport theory provides a powerful mathematical and computational framework for problems in data science and economics. This talk explored the inverse optimal transport problem—inferring the underlying cost structure from noisy data—and its applications to global trade. Examples highlighted the unequal impact of disruptions such as the war in Ukraine on global wheat markets, and provided insights into Brexit and other trade barriers.

- Bernd Sturmfels (MPI Leipzig)

  Gram Matrices for Isotropic Vectors

The algebraic geometry of low-rank symmetric matrices with zero diagonal blocks was discussed, with applications to kinematic variables in quantum field theory.

- Annika Lang (Chalmers University of Technology)

  Random Fields and Stochastic Partial Differential Equations on Surfaces: a Computational Approach

  Random fields and stochastic PDEs on manifolds were introduced with computational techniques for generating random samples and approximating solutions. Applications to evolving stochastic manifolds and random shapes were presented.

- Paul Balmer (UCLA)

  Impossible Classification and Tensor-Triangular Geometry

  The lecture surveyed mathematical areas where complete classification is not feasible and showed how geometric and categorical perspectives can provide insight, leading to the theory of tensor-triangular geometry.

- Gregory Miermont (ENS Lyon)

  Combinatorial and Probabilistic Aspects of Maps

  Random maps were presented as combinatorial models for random metrics. The lecture covered enumerative theory of maps and limiting random geometric structures.

- Angkana Rueland (University of Bonn)

  Nonlocality, Anisotropy and Inverse Problems

  The talk examined the Calderón problem and its nonlocal variants, highlighting how fractional formulations provide new insights into anisotropic inverse problems.

- Tim Browning (ISTA)

  Pairs of Commuting Matrices

  A new upper bound for the density of commuting pairs of integer matrices was presented, combining Fourier analysis and algebraic techniques. Joint work with Will Sawin and Victor Wang.

- Ilse Fischer (University of Vienna)

  The Art of Bijections: Alternating Sign Matrices and Littlewood Identities

  Classical equinumerosity phenomena involving alternating sign matrices and plane partitions were discussed, together with new bijective perspectives and Littlewood-type identities.

Public Lecture

The traditional public lecture was given by Bruno Buchberger from JKU, who also contributed to the meeting by playing live music at the reception on the first day. In his lecture "Künstliche Intelligenz: Alles Mathematik!", he reflected on the role of artificial intelligence in mathematics. He emphasized the self-algorithmizing nature of mathematics and argued for its unending creativity and societal relevance. Buchberger's lecture attracted a lot of attention beyond the participants of the meeting.

Sections

The program contained the following thematic sections. Sections consisted of up to twelve talks.

- S01 Algebra ∘ Organized by Dietrich Burde (Wien).
- S02 Analysis and Topology ∘ Organized by Hans G. Feichtinger (Wien) and ARI (OEAW)
- S03 Computer Algebra ∘ Organized by Christoph Koutschan (Linz), Daniel Robertz (Aachen)
- S04 Data Science ∘ Organized by Axel Klawonn (Köln), Martin Stoll (Chemnitz)
- S05 Differential Geometry and Global Analysis ∘ Organized by Ilka Agricola (Marburg), Verena Bögelein (Salzburg)
- S06 Discrete Mathematics ∘ Organized by Stephan Wagner (Graz)
- S07 Inverse Problems ∘ Organized by Barbara Kaltenbacher (Klagenfurt), Thomas Schuster (Saarbrücken), Bochra Mejri-Mergl (Linz), Simon Hubmer (Linz)
- S08 Logic ∘ Organized by Martin Goldstern (Wien)
- S09 Partial Differential Equations ∘ Organized by Elisa Davoli (Wien), Manuel Friedrich (Erlangen)
- S10 Stochastics ∘ Organized by Michaela Szölgyenyi (Klagenfurt), Anja Sturm (Göttingen)
- S11 Number Theory ∘ Organized by Kathrin Bringmann (Köln), Nicolas Smoot (Wien)

- S12 Numerical and Scientific Computing ∘ Organized by Michael Feischl (Wien), Markus Bachmayr (Aachen)
- S13 Optimization and Control ∘ Organized by Christian Clason (Graz), Anton Schiela (Bayreuth)
- S14 General Section ∘ Organized by Friedrich Pillichshammer (Linz)

Minisymposia

The program contained the following minisymposia. Minisymposia consisted of up to eight talks.

- M01 Additive Combinatorics and Discrete Geometry ∘ Organized by Oliver Roche-Newton (Linz), Audie Warren (Linz)
- M02 Algebraic Geometry and Representation Theory ∘ Organized by Eleonore Faber (Graz), Martin Kalck (Graz), Balázs Szendrői (Wien)
- M03 Analysis of Dynamical Systems in Mathematical Biology ∘ Organized by Burcu Gürbüz (Mainz), Nicola Vassena (Leipzig)
- M04 Applied Operator Theory ∘ Organized by Patricia Alonso Ruiz (Jena), Amru Hussein (Kassel), Delio Mugnolo (Hagen), Noema Nicolussi (Graz)
- M05 Approximation, Sampling, and Learning in High Dimensions ∘ Organized by Ahmed Abdeljawad (Linz), Anupam Gumber (Wien)
- M06 Frame Multipliers and Applications ∘ Organized by Diana T. Stoeva (Wien)
- M07 Higher Order Variational Problems in Analysis and Geometry ∘ Organized by Volker Branding (Wien), Anna Siffert (Münster)
- M08 Information-Based Complexity ∘ Organized by Friedrich Pillichshammer (Linz), Mario Ullrich (Linz)
- M09 Mathematical Research Data in the Era of Artificial Intelligence ∘ Organized by Thomas Koprucki (Berlin), Moritz Schubotz (Karlsruhe), Karsten Tabelow (Berlin), Olaf Teschke (Karlsruhe)
- M10 Mathematics and Arts ∘ Organized by Marlene Knoche (Görlitz), Diaaeldin Taha (Leipzig)
- M11 Mathematik und Gesellschaft ∘ Organized by Lara Gildehaus (Klagenfurt), Ralf Köhl (Kiel), Gudrun Thäter (Karlsruhe)

- M12 Numerical Methods for Evolutionary PDEs ∘ Organized by Matteo Ferrari (Wien), Monica Nonino (Wien)
- M13 Optimal Transport and applications ∘ Organized by Camilla Brizzi (München), Lorenzo Portinale (Milano)
- M14 Partial Differential Equations on Networks ∘ Organized by Martin Burger (Hamburg), Herbert Egger (Linz), Ariane Fazeny (Hamburg)
- M15 Random Matrices and Mathematical Physics ∘ Organized by Torben Krüger (FAU Erlangen), Jana Reker (ENS de Lyon)
- M16 Recent Developments in Several Complex Variables and Cauchy-Riemann Geometry ∘ Organized by Luke Edholm (Wien), Hendrik Herrmann (Wien), Weixia Zhu (Wien)
- M17 Set theoretic perspectives on the real line ∘ Organized by Takehiko Gappo (Wien), Corey Switzer (Wien)
- M18 Strengthening mathematical cooperation with the Global South ∘ Organized by Erhard Achinger (Linz), Balázs Szendrői (Wien)
- M19 Variational Methods for PDEs in Materials Science and Biology ∘ Organized by Rossella Giorgio (Wien), Anna Kubin (Wien), Dario Reggiani (Münster)
- M20 Weighted spaces in functional analysis and applications ∘ Organized by Stefan Fürdös (Wien), Gerhard Schindl (Wien)
- M21 Mathematical Analysis of Complex Quantum Systems ∘ Organized by Volker Bach (Braunschweig), Heinz Siedentop (München)

Further Program Elements

The opening on the first day included two award ceremonies. On behalf of the DMV, Jürg Kramer delivered the Minkowski medal for the year 2025 to Markus Hausmann (Bonn), and on behalf of the ÖMG, Vera Fischer delivered the ÖMG-Förderungspreis for the year 2025 to Juan P. Aguilera (TU Wien). The awardee gave a presentation on “Large infinities and ordinal-definability” on Wednesday. Also the award winner of the previous year, Matthew Kwan (ISTA), gave his award lecture at the meeting. He spoke about “Very Sparse Random Discrete Matrices”.

Both DMV and ÖMG held their respective annual business meetings on Wednesday afternoon.

The core program of the meeting was complemented by three satellite events:

- The Austrian Statistics Days (Andreas Futschik et al.)
- The Austrian Stochastics Day (Irene Tubikanec and Sascha Desmettre)
- The Teachers' Day (Markus Hohenwarter, Robert Weinhandl)

While scientifically and organizationally independent from the ÖMG-DMV-meeting, the schedules and locations of these meetings have been coordinated so as to enable exchange across communities.

The social program included a reception with live music on Monday and a conference dinner on Wednesday at the restaurant Josef in the city center. Coffee breaks facilitated informal discussions among participants throughout the week. Various publishers and producers of mathematical software enriched the coffee break area with their exhibitions.

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