# Programme

**Monday, December 9**

Chair Edward Saff
9:30-10:15 Stefan Steinerberger, Unexplained Regularity in Greedy Sequences
10:20-10:50 Coffee break
10:50-11:35 Felipe Goncalves, Linear Programming, Sign Uncertainty and Sphere Packings

Chair Dmitriy Bilyk
14:00-14:45 Frank Vallentin, Polarization of Lattices: Root Lattices and Linear Programming Bounds for Spherical Designs
14:50-15:35 Maya Stoyanova, Optimal Polarization (PULB) Pairs of Codes Found in the $E_8$ and Leech Lattices
15:40-16:10 Coffee break
16:10-16:55 Peter Dragnev, On Universal Optimality of Distance-Avoiding Spherical Codes

18:00 Welcome reception

**Tuesday, December 10**

Chair Peter Boyvalenkov
9:30-10:15 Peter Grabner, Singular Positive Definite Functions on Projective Spaces
10:20-10:50 Coffee break
10:50-11:35 Robert Womersley, Numerical Experiments with Good Riesz Energy Points on the Sphere $\mathbb{S}^2$: Asymptotics, Voronoi Cells and Scars

Chair Peter Grabner
14:00-14:45 Sergiy Borodachov, Maxima of the Potential and the Polarization Property of Distance-Regular Sets
14:50-15:20 Coffee break
15:20-16:05 Peter Boyvalenkov, Energy Bounds for Weighted Spherical Codes and Designs via Linear Programming

**Wednesday, December 11**

Chair Sergiy Borodachov
9:30-10:15 Florian Theil, The Read-Shockley Law
10:20-10:50 Coffee break
10:50-11:35 Tetiana Stepanyuk, Estimates for the Discrete Energies on the Spheres of Arbitrary Dimension

Chair Florian Theil
14:00-15:00 Danila Cherkashin, Extremal Problems on Euclidean Spheres
15:05-15:35 Coffee break
15:35-16:20 Johann Brauchart, Inner Product Expansions for Logarithmic and Riesz $s$-Energy Are Unexpected Successful
16:25-16:45 Geno Nikolov, Simple Bounds for the Extreme Zeros of Jacobi Polynomials

**Thursday, December 12**

Chair Robert Womersley
9:30-10:15 Dmitriy Bilyk, Phase Transitions and Discrete Minimizers in Energy Optimization
10:20-10:50 Coffee break
10:50-11:35 Jordi Marzo, Hyperuniformity and the Sum Charge Rule
11:40-12:25 Douglas Hardin, Linear Programming Bounds for the Energy of Lattice Periodic Configurations

Chair Edward Saff
14:00-15:00 Open problems session, part 1
15:00-15:30 Coffee break
15:30-16:30 Open problems session, part 2

19:00 Conference dinner (joint with Fifth International Conference "Women in Mathematics in South-Eastern Europe")

**Friday, December 13**

Chair Felipe Goncalves
9:30-10:15 Ryan Matzke, Surface Level Repulsion: Geodesic Riesz Energy on Spheres and Projective Spaces
10:20-10:50 Coffee break
10:50-11:35 Matthew de Courcy-Ireland, Room for One More? Saturation Probability of Random Lattice Packings

**Participants**

Dmitriy Bilyk (organizer), University of Minnesota, USA
Peter Grabner (organizer), Graz University of Technology, Austria
Edward Saff (organizer), Vanderbilt University, USA
Maya Stoyanova (organizer), FMI-SU, Bulgaria
Peter Boyvalenkov (local organizer), IMI-BAS, Bulgaria
Sergiy Borodachov, Towson University, USA
Johann Brauchart, Graz University of Technology, Austria
Danila Cherkashin, IMI-BAS, Bulgaria
Matthew de Courcy-Ireland, Stockholm University, Sweden
Peter Dragnev, Purdue University Fort Wayne, USA
Felipe Goncalves, IMPA, Brasil, SR
Douglas Hardin, Vanderbilt University, USA
Maryna Manskova, Graz University of Technology, Austria
Jordi Marzo, Universitat de Barcelona, Spain
Ryan Matzke, Vanderbilt University, USA
Geno Nikolov, FMI-SU, Bulgaria
Stefan Steinerberger, University of Washington, USA
Tetiana Stepaniuk, Institute of Mathematics, NAS of Ukraine, Ukraine
Florian Theil, Warwick University, UK
Frank Vallentin, Koeln University, Germany
Robert Womersley, University of New South Wales, Australia