SIMION STOILOW INSTITUTE OF MATHEMATICS OF THE ROMANIAN ACADEMY

Lucian Bădescu Prize: Award Ceremony

Monday, December 22, 2025

IMAR, *Miron Nicolescu* Amphitheater

11:00 Award Ceremony

Talks by the awardees

12:00 - 12:40 Cristina Palmer-Anghel (IMAR and Université Clermont-Auvergne): *Unifying quantum invariants via configuration spaces*

Quantum link invariants have their origin in representation theory and their geometry is a main open problem in quantum topology. Coloured Jones and coloured Alexander polynomials are two such sequences of invariants whose asymptotics is conjectured to capture deep geometric information. We will present a new topological perspective that unifies these invariants through the topology of configuration spaces. First, for a fixed level, we show that we can read off both coloured Jones and Alexander polynomials of a link from a fixed Lagrangian intersection in a configuration space. At the asymptotic level, Habiro defined his famous universal knot invariant globalising coloured Jones polynomials via representation theory. For the link case, this globalisation remained as an open problem for both sequences of invariants. We answer this open problem originating in representation theory using topological tools. More precisely we define geometrically a universal Jones link invariant and a universal Alexander link invariant via graded intersections in configuration spaces.

12:50 - 13:30 Martin Palmer-Anghel (IMAR): *Asymptotic monopoles, infinite-type surfaces and exotic groups*

I will talk about three recent results of different flavours related by the existence of homological stability phenomena. The first is a partial calculation of the homology of moduli spaces of asymptotic magnetic monopoles; this is currently much less well-understood than the classical monopole moduli spaces, whose homology is completely known after work of Donaldson, Segal and Cohen-Cohen-Mann-Milgram. The second is a complete calculation of the homology of the mapping class group of the plane minus a Cantor set, as well as other infinite-type surfaces. Finally, an important kind of embedding statement in group theory is "any group with property P embeds into an acyclic group with property P" (for example this is true for P = countability and may be used to prove Atiyah's L^2-index theorem). The third result that I will discuss is that this embedding statement is true for P = finiteness type F_n, extending results from the early 80s for n=1 and n=2. These results include joint work with Ulrike Tillmann and with Xiaolei Wu.