March 4, 2024

Vladimir Dragović

Ellipsoidal Billiards, Combinatorics, and Polynomial Pell's Equations

We discuss interrelations between billiards within ellipsoids in the d-dimensional Euclidean space, theory of approximations, theory of partitions, and polynomial Pell's equations over d real intervals. We classify periodic trajectories by employing their relationship with extremal polynomials. We answer positively all three Ramirez–Ros conjectures. We also study resonant trajectories by relating them to extremal rational functions and generalized Pell's equations. The talk is based on joint work with Milena Radnović and the following papers:

[1] V. Dragović, M. Radnović, Periodic ellipsoidal billiard trajectories and extremal polynomials, Communications. Mathematical Physics, 2019, Vol. 372, p. 183-211.

[2] G. Andrews, V. Dragović, M. Radnović, Combinatorics of the periodic billiards within quadrics, The Ramanujan Journal, Vol. 61, No. 1, p. 135-147, 2023.

[3] V. Dragović, M. Radnović, Resonance of ellipsoidal billiards trajectories and extremal rational functions, Advances in Mathematics, Article 109044, Vol. 424, 2023.

SCIENTIFIC SEMINAR
"DIFFERENTIAL GEOMETRY AND APPLICATIONS"

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