

Colloquium

University of Notre Dame
Department of Mathematics

Alexander Kiselev - Duke University

Speaker: Alexander Kiselev

Duke University

Will give a lecture entitled

The flow of polynomial roots under differentiation

Date: Friday, April 12, 2024

Time: 4:00 PM

Location: 129 Hayes-Healy Bldg



Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.

Zoom URL: NA

Abstract:

The question of how polynomial roots move under differentiation is classical. Contributions to this subject have been made by Gauss, Lucas, Marcel Riesz, Polya and many others. In 2018, Stefan Steinerberger derived formally a PDE that should describe the dynamics of polynomial roots under differentiation in certain situations. The PDE in question is of hydrodynamic type and bears a striking resemblance to the models used in mathematical biology to describe collective behavior and flocking of various species- such as fish, birds or ants. I will discuss joint work with Changhui Tan in which we establish global regularity of Steinerberger's equation and make a rigorous connection between its solutions and evolution of roots under differentiation for a class of trigonometric polynomials.