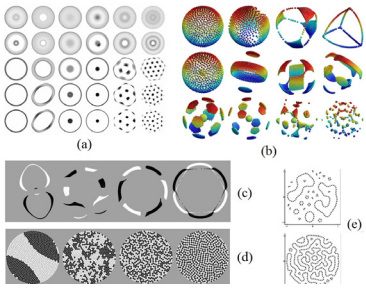
Theodore Kolokolnikov

Applied Mathematics

Dr. Kolokolnikov's group does research on differential equations, pattern formation, and collective behaviour in biological and physical systems. Very broadly, it falls into two areas:

- Models involving nonlocal equations and related phenomena
- Pattern formation in large-scale dynamical systems and PDE's

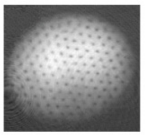


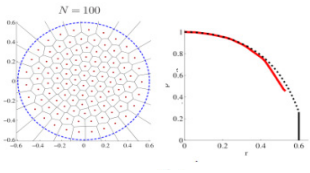
Recent work is related to analysis of PDE's that arise as limits of discrete systems, particularly non-local models of collective behaviour (both biological and physical). The common thread in his research is to derive precise, quantifiable predictions about the behaviour of the systems under study. Dr. Kolokolnikov's group uses a wide range of tools including statistical methods, differerential equations, dynamical systems, scientific computing, asymptotic analysis, graph theory and complex variables.

Recent topics include:

- Complex symmetry-breaking patterns in simple models
- Predator-swarm interactions.
- Vortex dynamics in Bose-Einstein Condensates
- Mathematics of crime

Students are involved in all stages of the projects, from model formulation to hands-on computation, programming, and theory.





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