Xinran Yu

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Research Interests

Geometric analysis
In particular· conformal geometry · generalized Einstein metrics on asymptotically hyperbolic spaces · conic singularities

Education

University of Illinois at Urbana-Champaign, Illinois 2017–present
Ph.D. in Mathematics, expected May 2025
MS in Mathematics, May 2019

University of Liverpool, Liverpool, United Kingdom 2015–2017
BSc in Mathematics (with Honors), June 2017
Thesis: *Analytic Continuation and Riemann Surfaces.* Supervisor: Dr. Jon Woolf.

Xi'an Jiaotong-Liverpool University, Suzhou, China 2013–2015
BSc in Applied Mathematics, June 2017

Teaching & Mentoring

Teaching Assistant, *University of Illinois at Urbana-Champaign* 2019–present
Teaching

Stand-alone Math231 Calculus II, Spring 2022
Discussion Math241 Calculus III, on the List of Teachers Ranked as Excellent by Their Students (Fall 2021)
Discussion Math231 Calculus II, on the List of Teachers Ranked as Excellent by Their Students (Spring 2021)
Tutor Math286 Introduction to Differential Equation Plus, Fall 2020

Grading

Geometry courses
· *Math402* Non Euclidean Geometry · *Math403* Euclidean Geometry · *Math423* Differential Geometry
· *Math518* Differentiable Manifolds I · *Math519* Differentiable Manifolds II · *Math512* Abstract Algebraic Geometry
· *Math514* Complex Algebraic Geometry
Analysis courses
· *Math541* Functional Analysis · *Math553* Introduction to Partial Differential Equations
· *Math489* Dynamics & Differential Equations
Algebra courses
· *Math416* Abstract Linear Algebra · *Math417* Introduction to Abstract Algebra I
· *Math418* Introduction to Abstract Algebra II · *Math417* Introduction to Abstract Algebra I
Topology courses
· *Math525* Algebraic Topology I

Graduate Team Leader at Illinois Geometry Lab, *University of Illinois at Urbana-Champaign* Fall 2019
Faculty mentor: Katelyn Leisman.
Project: *Simulating Multi-Soliton Solutions to NLS and KdV and Studying Interactions*

· Our team focused on the nonlinear Schrödinger (NLS) equation with nonzero boundary condition and studied the exact solution of a one-soliton solutions. We compared the solution of those with zero boundary condition, and used Python to generate figures and animations for the solution.

- Duty – Held weekly meetings and provided Python and LaTeX supports to the team.
  – Supervised on the mid-semester presentation and the open house event
  – Helped the team to formulate final report.

Talks

The fractional Laplacian through Dirichlet problem formulation Feb 2024
Graduate Geometry and Analysis Seminar at UIUC

Introduction to Lovelock metrics Nov 2023
Graduate Geometry and Analysis Seminar at UIUC

The ambient obstruction tensor Feb 2023
Graduate Geometry and Analysis Seminar at UIUC

Introduction to Einstein-Maxwell equations Oct 2022
Graduate Geometric Analysis Seminar at UIUC

The Rrenormalized Volume of Conformally compact Einstein Manifolds Oct 2022
Graduate Geometric Analysis Seminar at UIUC

Einstein Filling on Hyperbolic Ball Feb 2022
Graduate Analysis Seminar at UIUC

The Yamabe Problem Apr 2021
Graduate Geometry and Topology Seminar at UIUC

Honors & Awards

Ruth V Shaff & Genevie I. Andrews Fellowship, *University of Illinois at Urbana-Champaign* Spring 2024
Mathematics department fellowship

Wills Prize in Mathematics, *University of Liverpool* Jul 2017
Special honor in the examination for the degree of bachelor of science with honors.

IMA Prize, *University of Liverpool* Jul 2017
Outstanding performance in the final year, offered by the Institute of Mathematics and its Applications.

University Academic Achievement Award, *Xi'an Jiaotong-Liverpool University* 2014–2015
Top 10% of the program.

Services & Enrichment

International TA Panel Panelist, *University of Illinois at Urbana Champaign* Aug 2022
Discussing language requirements and how TA practices are different in the US compared to foreign countries.

Staff-Student Liaison Committee Member, *University of Liverpool* 2016–2017
Worked as a course representative. Offered student perspective on the Mathematics department and contributed to improvements of the department.

Skills

Python & R

- Attended PI4 Bootcamp and did a project regarding goodreads book analysis.
- Simulated solutions of a Nonlinear Schrödinger Equation and generated graphics for the solutions.

Mathematica