

Xinran Yu

University of Illinois at Urbana-Champaign, 1409 W. Green Street, Urbana, IL 61801, USA
xinran4@illinois.edu ◊ +1 (217) 550-2664 ◊ <https://xinrany.github.io/home/>

Research Interests

Geometric analysis

- conformal geometry • generalized Einstein metrics on asymptotically hyperbolic spaces
- conic singularities • wedge calculus and edge calculus

Education

Ph.D in Mathematics, *University of Illinois at Urbana-Champaign (UIUC)* expected May 2025

Master degree in May 2019

Research Focus: Conformal geometry, modifying Einstein's theory of general relativity.

Relevant Coursework: PDEs, Differential Geometry, Functional Analysis

BSc in Mathematics with Honors, *University of Liverpool and Xi'an Jiaotong-Liverpool University* 2017

Thesis: *Analytic Continuation and Riemann Surfaces*. Supervisor: Dr. Jon Woolf.

Teaching & Mentoring

Graduate Team Leader, *Illinois Math Lab, University of Illinois at Urbana-Champaign* Fall 2024

Project: [Documenting Historical Mathematical Models](#)

Faculty member: Sarah Park and Karen Mortensen

- Collaborating with the University Library to catalog one of the largest mathematical model collections globally.
- Developing a digital catalog using **Mathematica** for public exhibit and future access.

Graduate Team Leader, *Illinois Geometry Lab, University of Illinois at Urbana-Champaign* Fall 2019

Project: [Simulating Multi-Soliton Solutions to NLS and KdV and Studying Interactions](#)

Faculty member: Katelyn Leisman

- Simulated multi-soliton solutions to the nonlinear Schrödinger (NLS) equation with nonzero boundary conditions
- Used **Python** for data visualization and model creation.
- Supervised [mid-semester presentation](#) and [open house event](#) and led [final report](#).

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

Discussion Math220 Calculus I, Fall 2024

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 \(Spring 2021\)](#)

Tutored Math286 Introduction to Differential Equation Plus, Fall 2020

Talks

Conformal geometry in Lovelock gravity theories Apr 2024

AWM Graduate Student Colloquium at UIUC

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 Graduate Geometry and Analysis Seminar at UIUC	Feb 2023
Introduction to Einstein-Maxwell equations Graduate Geometric Analysis Seminar at UIUC	Oct 2022
The renormalized volume of conformally compact Einstein manifolds Graduate Geometric Analysis Seminar at UIUC	Oct 2022
Einstein filling on hyperbolic ball Graduate Analysis Seminar at UIUC	Feb 2022
The Yamabe problem Graduate Geometry and Topology Seminar at UIUC	Apr 2021

Honors & Awards

Ruth V Shaff & Genevie I. Andrews Fellowship , <i>University of Illinois at Urbana-Champaign</i> Mathematics department fellowship	Spring 2024
Wills Prize in Mathematics , <i>University of Liverpool</i> Special honor in the examination for the degree of bachelor of science with honors.	Jul 2017
IMA Prize , <i>University of Liverpool</i> Outstanding performance in the final year, offered by the Institute of Mathematics and its Applications.	Jul 2017
University Academic Achievement Award , <i>Xi'an Jiaotong-Liverpool University</i> Top 10% of the program.	2014-2015

Services & Enrichment

International TA Panel Panelist , <i>University of Illinois at Urbana Champaign</i> Discussing language requirements and how TA practices are different in the US compared to foreign countries.	Aug 2022
Staff-Student Liaison Committee Member , <i>University of Liverpool</i> Worked as a course representative. Offered student perspective on the Mathematics department and contributed to improvements of the department.	2016-2017

Projects and Related Courses

Goodreads Data Analysis , <i>PI4 Bootcamp, University of Illinois at Urbana-Champaign</i> Analyzed reading patterns and trends in book ratings using Python , providing insights into user behavior and preferences.	June 2020
Multi-Soliton Simulation , <i>Illinois Geometry Lab, University of Illinois at Urbana-Champaign</i> Led a team in simulating interactions between multi-soliton solutions, developing graphics and reports using Python to illustrate findings.	Fall 2019

Technical Skills

Programming Languages: Python, R

Data Analysis & Modeling: statistical analysis, Partial Differential Equations, machine learning

Software: Mathematica

Languages: English (fluent), German (intermediate), Japanese (intermediate)