

# Nathan Burns

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 LinkedIn  
 Website

## Education

### **University of Tennessee**

*Ph.D in Mathematics*

2021 - 2026

KNOXVILLE, TN

- Thesis: *The Free Boundary Curve Shortening Flow and Its Ancient Solutions*

*M.S in Mathematics*

- Concurrent Masters Degree: Awarded on the Way to Completing Ph.D

### **University of Edinburgh**

2016 - 2020

*M.Math in Mathematics*

EDINBURGH, UK

- First Class with Honours

## Research

### **Publications**

- T. Bourni, N. Burns and S. Catron, "Classification of convex ancient solutions to free boundary curve shortening flow in convex domains",  
*The Journal of Geometric Analysis*, Vol. 35, No. 7. 2025

### **In Preparation**

- T. Bourni, N. Burns, and M. Langford, "Classification of Convex Ancient Free Boundary Curve Shortening Flows in Convex Noncompact Domains", In preparation.
- T. Bourni, N. Burns, and M. Langford, "Stability of the Shrinking Semi-Circle Under the Free Boundary Curve Shortening flow", In Preparation.

### **Miscellaneous Research**

- A. Ho, S. Bagley, C. Beckford, N. Burns, E. Campbell, J. Kingsley and Mary E. Pilgrim, "In Between High School and College: A Qualitative Study on Educators' Self-Reported Teaching Practices",  
*Journal of Education*, DOI:10.1177/00220574261416889 2026
- THIS RESEARCH WAS DONE AS PART OF A RESEARCH ASSISTANTSHIP DURING THE FIRST YEAR OF GRADUATE STUDY.

## Service

### **Co-Organizer for the Geometric Analysis Seminar**

2025/2026 ACADEMIC YEAR

- University of Tennessee

## Academic Activity

### **Academic Visitor**

MARCH 2. - MARCH 8. 2025

- Australian National University

### **Program Associate**

OCT. 21. - NOV. 22. 2024

- SLMath (Formerly the MSRI)
- New Frontiers in Curvature: Flows, General Relativity, Minimal Submanifolds and Symmetry.

## Talks

- Johns Hopkins University - Geometric Analysis Seminar APRIL 2026
- NORTH CAROLINA STATE UNIVERSITY - GEOMETRY AND TOPOLOGY SEMINAR APRIL 2026
- AMS SPRING SOUTHEASTERN MEETING: GEOMETRIC AND NON-SMOOTH ANALYSIS MARCH 2026
- AMS FALL CENTRAL MEETING: RIEMANNIAN GEOMETRY AND SYMMETRY II OCT. 2025
- RUTGERS GAUGE THEORY, LOW-DIMENSIONAL TOPOLOGY, AND GEOMETRIC ANALYSIS MAY 2025
- AUSTRALIAN NATIONAL UNIVERSITY - GEOMETRIC ANALYSIS SEMINAR MARCH 2025

- MATRIX-MFO TANDEM WORKSHOP: NONLINEAR GEOMETRIC DIFFUSION EQUATIONS
- SLMATH (FORMERLY THE MSRI) - GRADUATE STUDENT SEMINAR
- PUNTA DEL ESTE (URUGUAY) - GEOMETRIC FLOWS AND RELATIVITY WORKSHOP

FEB. 2025  
NOV. 2024  
MARCH 2024

## Conference Attendance

- Courant-Rutgers Geometric Analysis Workshop 2026 - Rutgers University JAN. 2026
- TEXAS GEOMETRY AND TOPOLOGY CONFERENCE - UT DALLAS NOV. 2025
- AMS FALL CENTRAL MEETING: AMS SPECIAL SESSION ON RIEMANNIAN GEOMETRY AND SYMMETRY II OCT. 2025
- TOPICS IN DIFFERENTIAL GEOMETRY - BROWN UNIVERSITY JUNE 2025
- RUTGERS GAUGE THEORY, LOW-DIMENSIONAL TOPOLOGY, AND GEOMETRIC ANALYSIS MAY 2025
- MATRIX-MFO TANDEM WORKSHOP: NONLINEAR GEOMETRIC DIFFUSION EQUATIONS FEB. 2025
- THE 30TH SOUTHERN CALIFORNIA GEOMETRIC ANALYSIS SEMINAR - UC IRVINE FEB. 2025
- GEOMETRY AND ANALYSIS OF SPECIAL STRUCTURES ON MANIFOLDS - SLMATH NOV. 2024
- RECENT PROGRESS ON GEOMETRIC ANALYSIS AND RIEMANNIAN GEOMETRY - SLMATH OCT. 2024
- BRIDGING PDE AND GEOMETRIC FLOWS - CARDIFF UNIVERSITY JULY 2024
- KANSAS GEOMETRIC ANALYSIS CONFERENCE - WICHITA STATE UNIVERSITY APRIL 2024
- GEOMETRIC FLOWS AND RELATIVITY WORKSHOP - PUNTA DEL ESTE (URUGUAY) MARCH 2024
- GEOMETRIC FLOWS AND RELATIVITY SUMMER SCHOOL - UNIVERSIDAD DE LA REPÚBLICA MARCH 2024

## Teaching

All teaching as a graduate student at the University of Tennessee.

### ► Instructor of Record

- Math 152 - Calculus for the Life Sciences (2 Sections)
- Math 123 - Finite Mathematics (2 Sections)
- Math 113 - Mathematical Reasoning (3 Sections)

### ► Teaching Assistant

- Math 241 - Calculus III (1 Section)
- Math 231 - Differential Equations I (1 Section)
- Math 125 - Basic Calculus (1 Section)
- Math 119 - College Algebra (1 Section)
- Math 113 - Mathematical Reasoning (2 Sections)

## Fellowships/Awards

All Awards Received as a Graduate Student at the University of Tennessee

- Summer Departmental Research Fellowship SUMMER 2025
- SPIKE TICKLE STEM ENDOWED FELLOWSHIP SPRING 2025
- GRADUATE STUDENT FELLOWSHIP: PASSING UTK ORAL EXAM EARLY SPRING 2024
- GRADUATE STUDENT ACADEMIC ACHIEVEMENT AWARD SPRING 2024
- GRADUATE STUDENT FELLOWSHIP: PASSING PRELIMINARY EXAMS EARLY SPRING 2023
- F.M DRYZER MEMORIAL FELLOWSHIP FALL 2021
- GRADUATE SCHOOL FELLOWSHIP: PREVIOUS OUTSTANDING RECORD THROUGHOUT GRAD. SCHOOL