

# Andrew Graven

MATH PHD CANDIDATE · CALTECH

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## Education

### California Institute of Technology

PHD MATHEMATICS

- Advisor: Nikolai G. Makarov

Pasadena, CA

2021-Present

### Cornell University

BA MATHEMATICS, CONCENTRATION IN MATHEMATICS

- Summa cum laude
- Distinction in all subjects
- Research Advisor: John H. Hubbard

Ithaca, NY

2017-2021

## Professional Experience

Summers

2018-2020

**Caltech Summer Undergraduate Research Fellowship (SURF)**, California Institute of Technology, JPL

## Publications

### PUBLISHED

**Andrew J. Graven** and Nikolai G. Makarov. Quadrature Domains and the Faber Transform. arXiv, Sept. 2025. ([pdf](#))

**Andrew J. Graven** and John H. Hubbard. An Elementary Proof of Poincaré's Last Geometric Theorem. Pro Mathematica, Vol. 31, No. 62, Feb. 2021, pp. 61-93. ([pdf](#))

**Andrew J. Graven** Alan H. Barr, and Martin W. Lo. AAS 21-222: A Rapid Method for Orbital Coverage Statistics With  $J_2$  Using Ergodic Theory. AAS Space Flight Mechanics Meeting, 2021. ([pdf](#))

Leo Huang, **Andrew J. Graven** and David Bindel. Density of States Graph Kernels. SIAM International Conference on Data Mining, April 2021. ([pdf](#))

**Andrew J. Graven** and Martin W. Lo. AAS 19-681: The Long-Term Forecast of Station View Periods for Elliptical Orbits, Astrodynamics Specialist Conference, Portland, ME, Aug 2019. ([pdf](#))

### UNDER PREPARATION

**Andrew J. Graven**. Analysis of Log-Weighted Quadrature Domains, 2025

**Andrew J. Graven**, Nikolai G. Makarov. Abelian Quadrature Domains and Saffman-Taylor Fingering, 2025

**Andrew J. Graven**. On the Coefficients of Conformal Mappings of Quadratic Julia Sets (expository)

## Awards, Fellowships, & Grants

2025 **S. R. Johnson Prize for Excellence in Graduate Study**, Caltech Department of Mathematics

\$ 1,000

2021-2024 **DOD NDSEG Graduate Research Fellowship**, United States Department of Defense

\$ 42,200/yr

## Presentations

\* *presenting author*

### CONFERENCE PRESENTATIONS

- Andrew J. Graven\* August 2024. Uniqueness Problems for Generalized Quadrature Domains. 35th International Workshop on Operator Theory and its Applications, University of Kent.
- Andrew J. Graven\* May 2024. Generalized Quadrature Domains with connections to Hele-Shaw flow. Random Matrices and Related Topics in Jeju.
- Andrew J. Graven\*, Alan H. Barr, and Martin W. Lo. August 2021. A Rapid Method for Orbital Coverage Statistics With  $J_2$  Using Ergodic Theory. AAS Space Flight Mechanics Meeting, Virtual.
- Andrew J. Graven\* and Martin W. Lo. August 2019. The Long-Term Forecast of Station View Periods for Elliptical Orbits. Astrodynamics Specialist Conference, Portland, ME.