Daniel Santiago

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Education

Massachusetts Institute of Technology — Cambridge, MA
Bachelor of Science in Pure Mathematics — *Expected June 2024*

- GPA: 4.8/5.0

Research Experience

MIT Summer Program for Undergraduate Research — June 2023 – August 2023
Cambridge, MA

- Worked with graduate student Michael Law and undergraduate Isaac Lopez on a project generalizing the Positive Mass Theorem.

SMALL REU at Williams College — June 2022 – August 2022
Cambridge, MA

- Researched knotoids and links in handlebodies in the Knot Theory group at SMALL under Professor Colin Adams.

MIT Undergraduate Research Opportunities Program — September 2021 – June 2022
Cambridge, MA

- Studied explicit examples of cusp formation in the Plebanski-Demianski family of Einstein Metrics with Professor Tristan Ozuch and undergraduate Carlos Alvarado.

Research in Factorization Theory — August 2019-May 2020
Mayagüez, PR

- Worked with Professor Reyes M. Ortiz at the University of Puerto Rico on research in τ_n-factorizations over the integers.

Publications and Pre-prints

1. Adams, C., Bonat, A., Chande, M., Chen, J., Jiang, M., Romrell, Z., Santiago, D., Shapiro, B. and Woodruff, D., 2022. Hyperbolic Knotoids. arXiv preprint arXiv:2209.04556. Submitted.
2. Adams, C., Bonat, A., Chande, M., Chen, J., Jiang, M., Romrell, Z., Santiago, D., Shapiro, B. and Woodruff, D., 2022. Generalizations of Knotoids and Spatial Graphs. arXiv preprint arxiv:2209.01922. Submitted.
3. Alvarado, C.A., Ozuch, T. and Santiago, D. , 2022. Families of degenerating Poincaré-Einstein metrics on $\mathbb{R}^4$. arXiv preprint: arXiv:2206.07993. To appear in *Annals of Global Analysis and Geometry*.
4. Adams, C., and Santiago, D., 2023. Composition Properties of Hyperbolic Links in Handlebodies.New York Journal of Mathematics, 29, 1097-116.
5. Law, M., Lopez, I., and Santiago, D. Positive Mass Theorems for Weighted Manifolds and Smooth Metric Measure Spaces. In Preparation.

Awards

- Hartley Rogers Jr. Prize for best paper in the 2023 MIT Summer Program for Undergraduate Research. Received with Michael Law and Isaac Lopez.
- NSA First Mathematics Award at 2019 Intel International Science and Engineering Fair
- Fourth Mathematics Award at 2019 Intel International Science and Engineering Fair

Work and Reading Experience

Grader February 2022 -May 2022
Cambridge,MA

- Worked as a grader for the Introduction to Topology Class (18.901) at MIT

MIT Mathematics Directed Reading Program January 2022, January 2023
Cambridge,MA

- Read *Topics in Heat Equations* under the supervision of Julius Baldauf.
- Read Lawson and Michelson's *Spin Geometry* under the supervision of Natalia Pacheco-Tallaj.

MIT Undergraduate Research Opportunities Program July 2021- August 2021
Cambridge,MA

- Read about Riemannian metrics with constant Gauss curvature in dimension 2 with Professor Tristan Ozuch.

Expository Papers

1. The Spherical Bernstein Problem in S^3. Final Paper for the Seminar in Geometry course at MIT.

Conference Presentations

1. Pi Mu Epsilon poster presenter at 2023 Joint Mathematics Meetings. Presented on the project *Hyperbolic Knotoids*.

Community & Leadership

Staff Member in MIT Undergraduate Math Association 2020-2021, September 2022-Present
Cambridge, MA

- Working as Committee Head of the Diversity, Equity, Inclusion and Outreach Committee of the Undergraduate Math Association. Help organize events and plan activities of the Association.

Technical Skills

Languages: Bilingual (English and Spanish)
Computer Skills: LaTeX, Wolfram Language, Python