

# Jonah Robinson

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## EDUCATION

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**Texas A&M University**, College Station, Texas

Graduation: December 2022

- B.S. in Applied Mathematics (Honors), Concentration: Biological Science
- GPA: 3.824, Major GPA: 3.97

- M.S. in Mathematics
- GPA: 4.0

Graduation (expected): December 2024

## RESEARCH EXPERIENCE

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### Research Assistant

Summer 2022 – Present

*Advisors:* Frank Sottile, Matthew Faust

- Large-scale experimental study of Bloch varieties of discrete periodic operators using tools from computational and combinatorial algebraic geometry. Computations carried out on the math department's Whistler Computing Cluster.
- Led to a paper [2] currently in preparation as well as ongoing development of a Macaulay2 package.

### Spectral Theory of Differential Operators REU

Fall 2022 – Spring 2023

*Advisors:* Wencai Liu, Rodrigo Matos, Matthew Faust

- Studied Floquet isospectrality of discrete periodic Schrödinger operators with separable potentials. Established existence of separable complex potentials isospectral to the zero potential, resulting in [1].
- Led student group in regular meetings to make observations from computational data and work towards proofs of these observations.

### Directed Reading Program

Fall 2021

- Engaged in directed study of *Topological Crystallography with a View Towards Discrete Geometric Analysis* by Toshikazu Sunada
- Gave a twenty-minute presentation on topological crystallography to undergraduates in the mathematics department

## PUBLICATIONS & PREPRINTS

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1. M. Faust, W. Liu, R. Matos, J. Plute, J. Robinson, Y. Tao, E. Tran, C. Zhuang; Floquet isospectrality of the zero potential for discrete periodic Schrödinger operators. *J. Math. Phys.* 1 July 2024; 65 (7): 073501.
2. M. Faust, J. Robinson, F. Sottile, The critical point degree of a periodic graph, in preparation

## CONFERENCES & WORKSHOPS

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### SIAM TX-LA 7-th Annual Meeting

October 2024

*Minisymposium on Periodic Operators*

- Presented “The Critical Point Degree of a Periodic Graph”, slides

### TEXAS ALGEBRAIC GEOMETRY SYMPOSIUM

April 2024

*Joint between Texas A&M, Rice University, and University of Texas at Austin*

- Presented “Discrete Invariants of the Dispersion Relation”, poster

### TX-LA Undergraduate Mathematics Conference

March 2024

*Joint conference by Texas A&M, University of Houston, and Louisiana State*

- Presented “Floquet Isospectrality of the Zero Potential for Discrete Periodic Schrödinger Operators”, slides (joint)

**SIAM TX-LA 6-th Annual Meeting** October 2023  
*Minisymposium on Applications of Combinatorial and Computational Algebraic Geometry*  
 • Presented “Invariants of the Dispersion Relation for Discrete Periodic Operators”, slides

**Joint Mathematics Meetings Poster Presentation** January 2023  
*Pi Mu Epsilon Student Poster Session*  
 • Presented “Discrete Invariants of the Dispersion Relation”, poster

**Texas State Math Physics Summer School** July 2023, June 2024  
 • Participated in week-long mini courses on various special topics in mathematical physics

## **WORK & VOLUNTEER EXPERIENCE**

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**Graduate Teaching Assistant** Fall 2024  
*Texas A&M Department of Mathematics*  
 • Led recitations and python coding labs, graded quizzes, and proctored exams for Engineering Calculus I (MATH 151)

**Grader** Fall 2022 – Spring 2024  
*Texas A&M Department of Mathematics*  
 • Undergraduate Courses: Differential Equations (MATH 308), Business Calculus (MATH 142), Foundations of Mathematics (MATH 300), Complex Variables (MATH 407), Modern Algebra I (MATH 415)

**Help Session Tutor** Spring 2022 – Summer 2022  
*Math Learning Center, Texas A&M Department of Mathematics*  
 • Led weekly help sessions (virtual and in-person), open to all Texas A&M students, for Calculus II for Biological Sciences (MATH 148) and Linear Algebra (MATH 304).

**Texas A&M Math & Stats Fair** Spring 2022, Spring 2023  
*Texas A&M Department of Mathematics*  
 • Assisted with various activities involving geometric models with students K-12 from College Station and surrounding areas.

**Emergency Medical Technician Training** Summer 2020 – Spring 2021  
*Texas A&M Engineering Extension Service*  
 • Completed didactic course and laboratory on emergency medical response and care  
 • Rotated through St. Joseph’s emergency department and emergency medical response posts throughout Brazos county and surrounding rural counties, responding to 911 calls and assisting with patient care and transport

**Peer Recruiter** Summer 2021 – Fall 2021  
*Texas A&M Office of Admissions*  
 • Helped coordinate recruitment events for Texas A&M Office of Admissions, including student panels. These include recruitment events for students from historically underrepresented and underserved areas.  
 • Interacted directly with prospective students and parents during these events to answer questions and teach about opportunities at Texas A&M.

## **HONORS & AWARDS**

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**Department of Mathematics Classroom Excellence Award** Spring 2022, Fall 2022  
**Mathematics Departmental Honors** Spring 2021 – Fall 2022  
**Maroon and White Leadership Fellow** Spring 2021  
**Aggie Research Scholar** Fall 2020 – Spring 2021  
**Texas A&M Regents Scholar** Fall 2018 – Spring 2022

## LEADERSHIP

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### **Beta Tau Omega Fraternity, Inc.**

*President*

***Multicultural Fraternity***

Spring 2021 – Fall 2021

- Served as the official liaison between the organization and University faculty, Multicultural Greek Council, and Asian Presidents Council
- Oversaw organization projects and events such as our Gastric Cancer Philanthropy Week and our Memorial Scholarship, awarded each year to a student with outstanding contributions to the advancement of the Texas A&M APIDA community
- Led the organization of the Beta Tau Omega 25th Year Banquet with a budget of \$9000.

## PROGRAMMING

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Proficient in Python, Macaulay2, SageMath, MATLAB; competent in C++ and R  
Experience with parallel computing and computational clusters