

My thesis work concerns Weil reciprocity for certain rigid analytic curves. My mathematical interests include rigid analytic geometry (including global analytic, Banach algebraic, & condensed analytic geometry), p -adic Langlands, and arithmetic applications of techniques from low-dimensional topology.

Educational History

- 2018–2023 **Ph.D. in Mathematics**, *University of Texas at Austin.*
- 2014–2018 **B.Sc. in Mathematics**, *California Institute of Technology.*
- 2012–2014 **International Baccalaureate Diploma.**
- 2010–2014 **High School Diploma**, *Canyon del Oro High School, Arizona, Valedictorian.*

Employment History

Research Experience

- 2018–Present **Graduate Student**, *Advisor: Sam Raskin*, Department of Mathematics, UT Austin.
- 2017–2018 **Research Assistant**, *Yi Ni*, Department of Mathematics, Caltech.
Finished the prism manifold realization problem [1]. Project involved a systematic analysis of combinatorial data associated to certain prism manifolds, occasionally with computer assistance.
- 2016 & 2017 **Summer Undergraduate Research Fellow**, *Yi Ni and Faramarz Vafae*, Caltech.
Prism manifold realization problem I and II [2],[3].
- Summer 2015 **Summer Undergraduate Research Fellow**, *Pei-Yu Tsai*, Caltech.
Developed an algorithm that returns a conjecturally complete set of coset representatives for $\mathrm{GSp}(4)$ double quotients by discrete subgroups
- 2012–2014 **Optics Laboratory Intern**, *Brian Anderson*, University of Arizona.

Publications


- [1] William Ballinger, Yi Ni, Tynan Ochse, and Faramarz Vafae. “The prism manifold realization problem III”. In: *Proceedings of the London Mathematical Society* n/a.n/a (). DOI: <https://doi.org/10.1112/plms.12472>. eprint: <https://londmathsoc.onlinelibrary.wiley.com/doi/pdf/10.1112/plms.12472>. URL: <https://londmathsoc.onlinelibrary.wiley.com/doi/abs/10.1112/plms.12472>.
- [2] William Ballinger, Chloe Ching-Yun Hsu, Wyatt Mackey, Yi Ni, Tynan Ochse, and Faramarz Vafae. “The prism manifold realization problem”. In: *Algebr. Geom. Topol.* 20.2 (2020), pp. 757–816. DOI: 10.2140/agt.2020.20.757. URL: <https://doi.org/10.2140/agt.2020.20.757>.
- [3] William Ballinger, Yi Ni, Tynan Ochse, and Faramarz Vafae. “The prism manifold realization problem II”. In: *Communications in Analysis and Geometry* 29 (Sept. 2017). DOI: 10.4310/CAG.2021.v29.n6.a1.
- [4] T. Ochse. “Arithmetic knots in homology spheres”. Unpublished. 2018.

- [5] T. Ochse. “Comparing symplectic structures on $\mathrm{PGL}(2)$ -opers in moduli stacks”. Unpublished. 2020.
- [6] T. Ochse. “Weil reciprocity for rigid analytic curves”. In final draft phase. 2022.

Teaching Experience

- 2018–Present **Graduate Teaching Assistant**, *UT Austin*.
In my 9th semester of teaching. Have taught discrete mathematics, calculus, differential equations, and linear algebra.
- Summer 2022 **Instructor**, *UT Austin*.
Summer course on monoids and nim games
- 2016–2018 **Math 1 Study Session Leader**, *Caltech Dean’s Office*.
2016/17 **Lead TA for Math 0**, *Bob Pelayo & Caltech Dean’s Office*.
2016 **Grader**, *Art of Problem Solving*.
- 2015–2017 **Dean’s Tutor**, *Caltech Dean’s Office*.
- 2012–2014 **Tutor**, *Kumon, Oro Valley, AZ*.
- 2011–2012 **Tutor**, *The Tutoring Center, Marana, AZ*.

Service

- 2021–2022 **Mathematics research mentor**.
- 2020–2021 **High school research initiative math liaison**, *UTeach/Austin ISD*.
- 2017–2018 **President**, *Caltech math club*  .
- 2016–2017 **Secretary**, *Caltech math club*.
- 2015–2018 **Instructor: MATHCOUNTS[®]**, *Walter Reed Middle School, Los Angeles*.

Honors and Awards

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| 2022 | UT departmental travel award | |
| 2021 | Frank Gerth III Teaching Award | <i>UT Department of Mathematics</i> |
| 2019 | Frank Gerth III Teaching Award | <i>UT Department of Mathematics</i> |
| 2017 | Joanna Wall Muir Research Fellow | <i>Caltech Student-Faculty Program</i> |
| 2017 | Eric Temple Bell Research Prize | <i>Caltech Department of Mathematics</i> |
| 2017 | Patrick Hummel and Harry Gray Travel Grant | <i>Caltech Y (Grant for AWS 2017)</i> |

Conferences and Workshops

- Mar 7–11, 2020 **AWS 2020: Nonabelian Chabauty**, *SWC, University of Arizona*.
- Aug 5–9, 2019 **Arithmetic and Algebraic Geometry**, *University of Michigan*.
- Mar 2–6, 2019 **AWS 2019: Topology and Arithmetic**, *SWC, University of Arizona*.
- Mar 3–7, 2018 **AWS 2018: Iwasawa Theory**, *SWC, University of Arizona*.
- Aug 7–11, 2017 **Southeastern Undergraduate Mathematics Workshop**, *NSF Grant DMS-1552285, Georgia Institute of Technology*.
- Mar 11–15, 2017 **Arizona Winter School 2017: Perfectoid Spaces**, *SWC, University of Arizona*.

Selected Relevant Coursework

- Algebraic geometry
- Arithmetic geometry
- Complex geometry
- Moduli spaces
- p-adic Hodge theory
- Functional analysis
- Algebraic number theory
- PDE numerical analysis
- Game theory

Additional Skills

Experience with Python and various math-oriented programming software such as SageMath and SnapPy.
Foreign language experience: coursework in Spanish and French, currently learning Hebrew.