

## Arseniy (Senia) Sheydvasser

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**RESEARCH INTERESTS** Algebraic Number Theory; Integral Circle/Sphere Packings; Thin Groups; Orders of Quaternion Algebras; Additive Number Theory

**APPOINTMENTS** 2021 - Postdoctoral Fellow Technion, Israel  
2018 - 2020 Research Associate Graduate Center at CUNY, New York

**EDUCATION** *Doctor of Mathematics*, 2012 - 2018  
Yale University, New Haven, CT

*Bachelor of Mathematics, Bachelor of Physics, Magna Cum Laude* 2008 - 2012  
Bowdoin College, Brunswick, ME

### PAPERS

- *Generating Hyperbolic Isometry Groups by Elementary Matrices*, **Communications in Algebra** (2023)
- *Asymptotic Density of Apollonian-Type Packings* (with M. Litman), **arXiv**: 2108.06358
- *The Ulam Sequence of the Integer Polynomial Ring*, **Journal of Integer Sequences** **24** (2021)
- *The Twisted Euclidean Algorithm: Applications to Number Theory and Geometry*, **Journal of Algebra** **569** (2021) 823-855
- *Arithmetic Groups Constructed from Rings with Involution*, **arXiv**: 2005.00679
- *Quaternion Orders and Sphere Packings*, **Journal of Number Theory** **204** (2019) 41-98
- *Rigidity of Ulam Sets and Sequences* (with J. Hinman, B. Kuca, and A. Schlesinger), **Involve** **12(3)** (2019) 521-539
- *The Unreasonable Rigidity of Ulam Sequences* (with J. Hinman, B. Kuca, and A. Schlesinger), **Journal of Number Theory** **194** (2019) 409-425
- *Orders Over Algebras with Involution*, **Journal of Number Theory** **183** (2017) 249-268
- *A Corrigendum to Unreasonable Slightness*. **The American Mathematical Monthly** **123(5)** (2016) 482-485

### BOOKS

- *Linear Fractional Transformations: an Illustrated Introduction*, Undergraduate Texts in Mathematics, Springer. April 2023

## TALKS

- **Rutgers University**, *Are Arithmetic Groups Uniformly Bi-Interpretable with Arithmetic?*. Jan. 2023
- **MOPA** (virtual), *Are Arithmetic Groups Uniformly Bi-Interpretable with Arithmetic?*. Jan. 2023
- **New Trends in Quaternions and Octonions** (virtual), *Is Unreasonable Slightness a General Phenomenon?*. Nov. 2021
- **Rutgers University** (virtual), *Is Unreasonable Slightness a General Phenomenon?*. Nov. 2021
- **CANT 2020** (virtual), *A Twisted Euclidean Algorithm*. May. 2020
- **UC Davis** (virtual), *Algebraic Invariants of Hyperbolic 4-Orbifolds*. May. 2020
- **Graduate Center**, *The Quaternion-Bianchi Dictionary*. Nov. 2019
- **Illustrating Number Theory and Algebra** (at ICERM), *Euclidean Algorithm in Circle / Sphere Packings*. Oct. 2019
- **Journées sur les Arithmétiques Faibles** (at CUNY), *Applications of Model Theory to Families of Integer Sequences*. May. 2019
- **Graduate Center**, *Hyperbolic Isometry Groups and Quaternion Algebras*. Apr. 2019
- **Graduate Center**, *Applications of Orders with Involution*. Mar. 2019
- **Bronx Community College**, *Two Trivial Problems and an Impossible One*. Dec. 2018
- **Integers 2018**, *Rigidity in the Ulam sequence*. Oct. 2018
- **New York Logic Model Theory Seminar** (at CUNY), *Rigidity in the Ulam sequence*. Sep. 2018
- **CANT 2018** (at CUNY), *Rigidity in the Ulam sequence*. May. 2018
- **Rutgers University**, *Connections between Integral Sphere Packings and Quaternion Algebras*. May. 2018
- **Dartmouth College**, *Quaternion Algebras and Integral Sphere Packings*. Feb. 2017
- **University of Colorado, Boulder**, *Quaternion Algebras and Integral Sphere Packings*. Oct. 2016

## TEACHING

### CUNY

- Spring 2020: Calculus with Analytic Geometry II
- Spring 2019: Calculus with Analytic Geometry I

### Yale University

- Spring 2018: Calculus of Functions of One Variable II (flipped classroom)
- Fall 2017: Cryptography and Computer Security
- Fall 2016: Calculus of Functions of One Variable I
- Fall 2015: Multivariable Calculus
- Spring 2014: Calculus of Functions of One Variable II (flipped classroom)

**STUDENT ADVISING EXPERIENCE**      *Graduate Mentor at SUMRY*      June-August 2017  
Worked with J. Hinman, B. Kuca, and A. Schlesinger on “The Unreasonable Rigidity of Ulam Sets.”

*Graduate Mentor at SUMRY*      June-August 2016  
Worked with R. Mintzer-Sweeney, A. Schlesinger, and K. Xiu on “Embeddings of Imaginary Quadratic Fields into Rational Quaternion Algebras.”

*Graduate Mentor at DIMACS REU*      June-July 2015  
Worked with L. Kenigsberg on “Cymatics-Chlandi Plates.” (Kenigsberg won a Goldwater scholarship for this work)

*Undergraduate Mentor at PROMYS*      July-August 2011

**PROGRAMMING LANGUAGES** Python, Sage, Java, Mathematica

**PUBLIC TALKS**

- **Massachusetts Academy of Math and Science**, *How to Keep a Secret*. Aug. 2019

**BROADER IMPACTS**

- Top Writer at Quora ([quora.com/profile/Senia-Sheydvasser](https://www.quora.com/profile/Senia-Sheydvasser)), writing primarily about mathematics.
- Founder of Mathematical Applications ([quora.com/q/mathematical-applications](https://www.quora.com/q/mathematical-applications)).