GREG KNAPP

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CURRENT EMPLOYMENT

University of Calgary   August 2023–Present
PIMS Postdoctoral Fellow

- Supervisor: Dang-Khoa Nguyen
- Current research topics: Thue equations, exponential inequalities among algebraic integer conjugates, effective improvements to Liouville's Theorem, polynomial root separation.

EDUCATION

University of Oregon   August 2017–June 2023
PhD, Mathematics   June 2023
  Dissertation: "Polynomial Root Distribution and Its Impact on Solutions to Thue Equations"
  Advisor: Shabnam Akhtari
Overall GPA: 4.10

Case Western Reserve University   August 2013–August 2017
Bachelor of Science, Mathematics   May 2017
Bachelor of Arts, Philosophy   May 2017
Master of Science, Mathematics   August 2017
  Thesis: "Minkowski's Linear Forms Theorem in Elementary Function Arithmetic"
  Advisor: Colin McLarty
Overall GPA: 4.0

RESEARCH AND PRESENTATIONS

Research Papers

- Greg Knapp. The number of solutions to the trinomial Thue equation. *Functiones et Approximatio Commentarii Mathematici*, 69(2):247 – 270, 2023a. doi: 10.7169/facm/2093. URL https://doi.org/10.7169/facm/2093
- Greg Knapp. *Polynomial Root Distribution and Its Impact on Solutions to Thue Equations*. PhD thesis, University of Oregon, 2023b. URL https://www.proquest.com/pqdtglobal/docview/2842741022/fulltextPDF
- Greg Knapp. Minkowski's Linear Forms Theorem in Elementary Function Arithmetic. Master's thesis, Case Western Reserve University, 2017. URL http://rave.ohiolink.edu/etdc/view?acc_num=case1495545998803274

Upcoming Talks

- "Exponential Relations Among Algebraic Integer Conjugates." 2024 CMS Summer Meetings. Saskatoon, SK (June 2024).

Previous Research Talks

- "Exponential Relations Among Algebraic Integer Conjugates." Alberta Number Theory Days. Banff International Research Center. Banff, AB (March 2024). Link to recording: https://www.birs.ca/events/2024/2-day-workshops/24w2020/videos/watch/202403231735-Knapp.html.
- "Polynomial Root Separation and Mahler Measure." Special session of the 2023 CMS Winter Meetings: Number Theory by Early Career Researchers. Montréal, QC (December 2023).

- "Bounds on the Number of Solutions to Thue's Inequality." PIMS Postdoctoral Fellow Seminar. Online (October 2023). Link to recording:
  `https://mathtube.org/lecture/video/bounds-number-solutions-thue-equations`.
- "Bounds on the Number of Solutions to Thue's Inequality." Oregon State University Number Theory Seminar. Corvallis, Oregon (February 2023).
- "Bounds on the Number of Solutions to Thue's Inequality." University of British Columbia Online Number Theory Seminar. Vancouver, BC (December 2023).
- "Bounds on the Number of Solutions to Thue's Inequality." Portland State University GDMNT. Portland, Oregon (November 2023).
- "An Improvement on a Gap Principle Counting Technique and Some Consequences." New York State Regional Graduate Mathematics Conference, Syracuse University, Syracuse, NY (April 2022).
- "An Improvement on a Gap Principle Counting Technique and Some Consequences." Oregon Number Theory Days, Oregon State University, Corvallis, OR (February 2022).
- "Convex Geometry and Minkowski's Linear Forms Theorem in Elementary Function Arithmetic." Master's Thesis Defense, Case Western Reserve University, Cleveland, OH (April 2017).
- "Factorization Properties of Int($\mathbb{Z}$)" (with J. Salem and G. Scullard). Joint Mathematics Meetings—Undergraduate Poster Session, Atlanta, GA (January 2017).
- "Non-Unique Factorization, Elasticity, and Catenary Degree in Int($\mathbb{Z}$)." Pi Mu Epsilon Meeting, Case Western Reserve University, Cleveland, OH (September 2016).
- "Factorization Properties of Int($\mathbb{Z}$)" (with J. Salem and G. Scullard). Young Mathematicians Conference—Report Talk, The Ohio State University, Columbus, OH (August 2016).

Expository Talks
- "Computation in Thue Equation Research." Number Nosh Seminar, University of Calgary, Calgary, AB (October, 2023).
- "On Diophantine Approximation." Student Number Theory Seminar, University of Oregon, Eugene, OR (June 2023).
- "What Everyone Should Know About Polynomials." Student Number Theory Seminar, University of Oregon, Eugene, OR (February 2023).
- "When Do Polynomials Have a Real Root?" Student Number Theory Seminar, University of Oregon, Eugene, OR (November 2022).
- "On Thue's Equation." Student Number Theory Seminar, University of Oregon, Eugene, OR (October 2022).
- "Quadratic Reciprocity via Lucas Polynomials." Student Number Theory Seminar, University of Oregon, Eugene, OR (May 2022).
- "Galois Connections." Student Number Theory Seminar, University of Oregon, Eugene, OR (February 2022).
- "Why The Golden Ratio is the Worst." Math Slam Seminar, University of Oregon, Eugene, OR (October 2021).
- "An Introduction to Thue's Inequality." Student Number Theory Seminar, University of Oregon, Eugene, OR (October 2021).
- "Newton Polygons." Student Number Theory Seminar, University of Oregon, Eugene, OR (April 2021).
- "Introducing and Visualizing the p-adic Numbers." Student Number Theory Seminar, University of Oregon, Eugene, OR (January 2021).
- "How to Tell if a Number Field is Formally Real." Student Number Theory Seminar, University of Oregon, Eugene, OR (November 2020).
- "Geometry of Numbers and Its Number Theoretic Applications." Student Number Theory Seminar, University of Oregon, Eugene, OR (October 2020).
- "Dirichlet Series and Why the Sum of the Natural Numbers is (Not) $-1/12$." Student Number Theory Seminar, University of Oregon, Eugene, OR (October 2020).
- "Introduction to the Weil Height." Student Number Theory Seminar, University of Oregon, Eugene, OR (October 2020).

- "Why the Golden Ratio is the Worst: Approximation and Continued Fractions." Student Number Theory Seminar, University of Oregon, Eugene, OR (January 2020).
- "The Basics of Modular Forms." Student Number Theory Seminar, University of Oregon, Eugene, OR (June 2019).
- "The Geometry of Numbers and Minkowski's Linear Forms Theorem." Student Number Theory Seminar, University of Oregon, Eugene, OR (February 2019).
- "Galois Theory In Peano Arithmetic." Student Number Theory Seminar, University of Oregon, Eugene, OR (May 2018).
- "Minkowski's Convex Body Theorem in Elementary Function Arithmetic." Graduate Notions Seminar, University of Oregon, Eugene, OR (November 2017).

TEACHING EXPERIENCE

University of Calgary   August 2023–Present
PIMS Postdoctoral Fellow

- Taught coordinated courses as instructor of record.
  - Math 211—Linear Methods I

University of Oregon   August 2017–June 2023
Graduate Employee

- Taught courses as both the instructor of record and as a teaching assistant.
- Courses for which I have been instructor of record:
  - Math 105—University Mathematics I
  - Math 111—College Algebra
  - Math 112—Elementary Functions
  - Math 242—Calculus for Business and Social Sciences II
  - Math 251—Calculus I: Differentiation
  - Math 252—Calculus II: Integration
  - Math 253—Calculus II: Sequences and Series
  - Math 347—Fundamentals of Number Theory I
  - Math 348—Fundamentals of Number Theory II
- Courses for which I have been a teaching assistant:
  - Math 111—College Algebra
  - Math 241—Calculus for Business and Social Sciences I
  - Math 242—Calculus for Business and Social Sciences II
- Other educational opportunities:
  - "Preschool" Instructor—I co-ran a two week long problem solving session with incoming first-year PhD students to help them decide which classes to take during their first year.

Case Western Reserve University   January 2015–May 2017
Peer Tutor

- Served as a peer tutor for about 8 hours per week.
- Tutored in the following classes:
  - Calculus I, II, III
  - Differential Equations
  - Linear Algebra
  - Abstract Algebra

· Intro to Logic
· Math Logic and Model Theory

· Assisted in the creation of the spring 2016 training sessions.

Boonshoft Museum of Discovery   Summer 2013, 2014, 2015, 2017
Summer Educator

· Created and taught three week-long summer camps: a math/logic/computer science camp, a computer programming camp, and a creativity/teamwork focused camp.
· Taught public programs: designed and demonstrated science experiments to the museums' guests
· Served as a camp counselor for summer campers (ages 6–14): escorted campers to and from classes and positively interacted with the campers within their classes.

MENTORING

PIMS First Year Interest Group   October 2023–Present
Diophantine Approximation

· Mentored a graduate-level reading project on Diophantine approximation.
· Met once every other week to discuss readings from Schmidt's *Diophantine Approximation* and Bilu and Bugeaud's *Démonstration du théorème de Baker-Feldman via les formes linéaires en deux logarithmes*.

University of Oregon Directed Reading Program   January 2023–April 2023
Continued Fractions

· Mentored an undergraduate reading project on the measure theory of continued fractions.
· Met once per week with my student to discuss the second half of A. Khichin's *Continued Fractions*.
· Advised the student's 20 minute presentation on Khinchin's Theorem.

University of Oregon Directed Reading Program   January 2020–April 2021
Formal Logic

· Mentored an undergraduate reading project in formal logic, ranging from the Gödel's Incompleteness Theorem to subsystems of Peano Arithmetic.
· Met roughly once per week with my student January–March 2020 and July 2020–December 2022.
· Student read selections from chapters 1, 2, and 4 of Goldstern and Judah's *The Incompleteness Phenomenon* and from chapter 1 of Hájek and Pudlák's *Metamathematics of First-Order Arithmetic*.
· Student gave a 20 minute presentation on the first-order system of Peano Arithmetic.

University of Oregon Department of Mathematics   August 2019–June 2023
First-Year Mentor

· Mentored first-year mathematics graduate students.
· Met formally once per quarter and informally more frequently with my mentees to ensure that they were doing well during their first year of graduate school.

SERVICE AND MEMBERSHIPS

University of Calgary Number Nosh Seminar   September 2023–Present
Organizer

Acta Arithmetica   June 2023–Present
Referee

UO Graduate Student Teaching Seminar   December 2019–March 2023
Co-organizer

UO Graduate Student Chapter of the AWM	August 2019–June 2023
Member and Co-chair of the K-12 Outreach Committee	
UO Graduate Student Chapter of the AMS	July 2020–October 2022
Co-founder, Secretary	
UO Graduate Student Number Theory Seminar	March 2021–September 2022
Organizer	
Periodica Mathematica Hungarica	January 2022–June 2022
Referee	
UO Math Department Graduate Affairs Committee	August 2019–June 2021
Elected Student Representative	
Boonshoft Museum of Discovery	June/July 2012 and July 2016
Camp Counselor	

HONORS AND AWARDS

University of Calgary Students' Union Teaching Excellence Award nominee for teaching excellence in my winter 2024 Linear Methods I class (finalists have yet to be announced).

Anderson Graduate Teaching Award for teaching dedication and excellence as a graduate student.

John Schoff Millis Award for the senior with the best academic record in the College of Arts and Sciences at CWRU.

Outstanding Poster Award for the top 10% of poster presentations in the Undergraduate Poster Session of the Joint Mathematics Meetings, 2017.

Dean's High Honors (8 semesters) at CWRU.

Case Alumni Association Junior-Senior Scholarship recipient.