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, Diophantine inequalities, Diophantine tuples, polynomial root separation.

EDUCATION

University of Oregon
PhD, Mathematics June 2023
Advisor: Shabnam Akhtari

Case Western Reserve University
Bachelor of Science, Mathematics May 2017
Bachelor of Arts, Philosophy May 2017
Master of Science, Mathematics August 2017
Advisor: Colin McLarty

TEACHING EXPERIENCE

University of Calgary August 2023–Present
PIMS Postdoctoral Fellow and Sessional Instructor

- Courses taught as instructor of record:

Course Title	Terms Taught
Linear Methods I	F23, W24, F24

- Earned the following badges from the University of Calgary Taylor Institute for Teaching and Learning.

Course Title	Month Completed
Scholarship of Teaching and Learning Foundations	June 2024
Developing Your Teaching Dossier	May 2024
Equity, Diversity, and Inclusion	April 2024

- Will complete the Postdoctoral Scholar Certificate in University Teaching and Learning when I complete the Theories and Practice badge in October 2024.

University of Oregon August 2017–June 2023
Graduate Employee

- Courses taught as instructor of record:

Course Title	**Terms Taught**
University Mathematics I	Su18, Su19
College Algebra	F17
Elementary Functions	Sp18
Calculus for Business and Social Sciences II	F18
Differential Calculus	W20, F20
Integral Calculus	Sp20, W21, F21
Sequences and Series	Sp21
Fundamentals of Number Theory	W22, Sp22

- Courses for which I have been a teaching assistant:

Course Title	**Terms as TA**
College Algebra	Sp19
Calculus for Business and Social Sciences I	W18, F19, Sp23, W23
Calculus for Business and Social Sciences II	W19

Case Western Reserve University January 2015–May 2017
Peer Tutor

- Tutored peers for for about 8 hours per week 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.

Notable Teaching Activities

- Winter 2024: Designed and implemented a series of exploratory exercises on math games like Nim and Chomp for a series of regular outreach events called Math Nites.
- Fall 2023: Designed and implemented weekly active learning sessions for my linear algebra class.
- Spring 2023: Co-designed and ran activities on math games like Set and Dots & Boxes for one session of the Eugene Girls' Science Adventure Days.
- Summer 2022: Co-ran a two week long problem solving session with incoming first-year PhD students at the University of Oregon to help them decide which classes to take during their first year.
- Spring 2022: Co-designed and ran activities on math magic for one session of the Eugene Girls' Science Adventure Days.
- Spring 2020: Designed and ran a fully asynchronous integral calculus class, with lecture videos you can find here: `https://www.youtube.com/@gregknapp1653`

RESEARCH EXPERIENCE

Research Papers

- Seda Albayrak, Samprit Ghosh, Greg Knapp, and Khoa D. Nguyen. On certain polytopes associated to products of algebraic integer conjugates. Submitted for publication, preprint available at `https://arxiv.org/abs/2408.00250`, 2024.
- Greg Knapp and Chi Hoi Yip. Upper bounds on polynomial root separation. Accepted for publication in *Bulletin of the Australian Mathematical Society*, preprint available at `https://arxiv.org/abs/2410.01126`, 2024.
- Greg Knapp. The number of solutions to the trinomial Thue equation. *Functiones et Approximatio Commentarii Mathematici*, 69(2):247 – 270, 2023.
- Greg Knapp. *Polynomial Root Distribution and Its Impact on Solutions to Thue Equations*. PhD thesis, University of Oregon, 2023.
- Greg Knapp. Minkowski's Linear Forms Theorem in Elementary Function Arithmetic. Master's thesis, Case Western Reserve University, 2017.

Works In Progress

- A Family of Thue Equations Over Imaginary Quadratic Number Fields (with Eva Goedhart and Sumin Leem).
- Bipartite Diophantine Tuples (with Kin Ming Tsang and Chi Hoi Yip).

Upcoming Talks

- Special Session on Number Theory and Field Theory II, 2025 Joint Mathematics Meetings, January 9, 10:15–10:30 AM, Seattle, WA.
- Number Theory and Combinatorics Seminar, University of Lethbridge. January 20, 2025. Lethbridge, AB.

Invited Talks

- PIMS Postdoctoral Summit, University of Calgary, June 2024.
- Number Theory By Early Career Researchers, 2024 CMS Summer Meetings, University of Saskatoon, June 2024.
- Calgary Junior Math Contest Awards Ceremony, University of Calgary, June 2024
- PIMS CRG Seminar: L-functions in Analytic Number Theory, University of Lethbridge, April 2024.
- Alberta Number Theory Days, Banff International Research Center, March 2024.
- PIMS Postdoctoral Fellow Seminar, Online, October 2023.
- Oregon State University Number Theory Seminar, February 2023.
- University of British Columbia Number Theory Seminar, December 2022.
- Portland State University GDMNT, November 2022
- Oregon Number Theory Days, Oregon State University, February 2022.

Contributed Talks

- Number Theory by Early Career Researchers, 2023 CMS Winter Meetings, Montréal, QC, December 2023.
- Oregon Number Theory Days, Oregon State University, February 2023.
- New York State Regional Graduate Mathematics Conference, Syracuse University, April 2022.
- Undergraduate Poster Session, Joint Mathematics Meetings, Atlanta, GA, January 2017.
- Young Mathematicians Conference, Ohio State University, August 2016.

Links to Recorded Talks

- "Bounds on the Number of Solutions to Thue Equations." PIMS CRG Seminar: L-functions in Analytic Number Theory. University of Lethbridge. Lethbridge, AB (April 2024). `https://www.mathtube.org/lecture/video/bounds-number-solutions-thue-equations-0`.
- "Exponential Relations Among Algebraic Integer Conjugates." Alberta Number Theory Days. Banff International Research Center. Banff, AB (March 2024). `https://www.birs.ca/events/2024/2-day-workshops/24w2020/videos/watch/202403231735-Knapp.html`.

MENTORING

PIMS First Year Interest Group October 2023–May 2024
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.*

- Continued working with these students on a research project on a generalization of Diophantine m-tuples, which we hope will produce a paper in winter 2025.

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 help them during their first year of graduate school.

SERVICE

Outreach

- Letters to a Pre-Scientist — October 2024–Present
  Pen pal
- University of Calgary Math Nite — September 2023–Present
  Volunteer
- University of Oregon AWM Graduate Student Chapter — August 2019–June 2023
  Co-chair of the K-12 Outreach Committee
- Eugene Girls' Science Adventure Days — March 2022, 2023
  Volunteer instructor
- Eugene Math Festival — February 2020, 2022, 2023
  Volunteer activity leader
- Boonshoft Museum of Discovery — June/July 2012 and July 2016
  Camp Counselor

Leadership

- 2025 Alberta Number Theory Days — September 2024–Present
  Co-organizer
- University of Calgary Number Nosh Seminar — September 2023–Present
  Organizer
- University of Oregon Graduate Student Teaching Seminar — December 2019–March 2023
  Co-organizer
- University of Oregon AMS Graduate Student Chapter — July 2020–October 2022
  Co-founder and Secretary
- University of Oregon Student Number Theory Seminar — March 2021–September 2022
  Organizer
- University of Oregon Math Department — August 2019–June 2021
  Elected Student Representative to the Graduate Affairs Committee

Refereeing

- Research in Number Theory (1 paper refereed)
- Acta Arithmetica (1 paper refereed)
- Periodica Mathematica Hungarica (1 paper refereed)

HONORS AND AWARDS

PIMS/BIRS Team Up award recipient, November 24–December 7, 2024 (with Eva Goedhart and Sumin Leem).

University of Calgary Students' Union Teaching Excellence Award nominee for teaching excellence in my winter 2024 Linear Methods I class.

Anderson Graduate Teaching Award for teaching dedication and excellence as a graduate student (awarded in 2022 for my work in 2017–2022).

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.

Case Alumni Association Junior-Senior Scholarship recipient.