

# Andrew Schopieray

*Mathematician and Educator*

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## Employment

- 2023–Present **Postdoctoral Fellow**, *University of Alberta*, Edmonton  
Supervisor: Terry Gannon
- 2021–2023 **PIMS Postdoctoral Fellow**, *University of Alberta*, Edmonton  
Partially funded by the Pacific Institute for the Mathematical Sciences  
Supervisor: Terry Gannon
- 2020 **Postdoctoral Fellow**, *Simons Laufer Mathematical Sciences Institute*, Berkeley  
Formerly the Mathematical Sciences Research Institute
- 2017–2019 **Postdoctoral Scientist**, *University of New South Wales*, Sydney  
Supervisor: Pinhas Grossman
- 2013–2015 **Talented & Gifted Educator**, *University of Oregon*, Eugene  
University of Oregon Youth Enrichment and Gifted Program
- 2012–2017 **Graduate Teaching Fellow**, *University of Oregon*, Eugene  
Department of Mathematics
- 2011–2012 **Community Education Instructor**, *Whatcom Community College*, Bellingham
- 2010–2012 **Graduate Teaching Assistant**, *Western Washington University*, Bellingham  
Department of Mathematics

## Education

- 2012–2017 **PhD Mathematics**, *University of Oregon*, Eugene  
Advisor: Victor Ostrik  
Thesis: Relations in the Witt group of nondegenerate braided fusion categories arising from the representation theory of quantum groups at roots of unity
- 2010–2012 **MS Mathematics**, *Western Washington University*, Bellingham  
Advisor: Amites Sarkar
- 2007–2010 **BS Mathematics**, *Grand Valley State University*, Allendale  
Minor studies: Psychology

## Awards & External Funding

- 2022 Grant for *Focussed research group*, BIRS (22frg002), Banff, Canada  
Role: Lead organizer  
Title: Non-Classical Constructions in Tensor Categories and Conformal Field Theory
- 2018 Travel grant for *NZMRI Summer School*, Nelson, New Zealand  
Awarded by the New Zealand Mathematics Research Institute
- 2017 Travel grant for *Joint Mathematics Meetings*, Atlanta, United States  
Awarded by the American Mathematical Society

- 2016 Travel grant for *Modular Categories—Their Representations, Classification, and Applications*, BIRS (16w5049), Oaxaca, Mexico  
Awarded by the University of Oregon Mathematics Department Travel Committee  
Travel grant for *AMS Spring Western Sectional Meeting*, Salt Lake City, United States  
Awarded by the American Mathematical Society
- 2015–2016 Graduate Teaching Mentor Award, University of Oregon  
Awarded by the University of Oregon Teaching Effectiveness Program
- 2014 Travel grant for *Algebraic Lie theory summer school*, Glasgow, Scotland  
Awarded by the London Mathematical Society and the Clay Institute
- 2011–2012 Elias A. Bond Graduate Fellowship, Western Washington University  
2011 Richard Greene Graduate Scholarship, Western Washington University  
2010 Outstanding Senior Award, Grand Valley State University

## Publications

### Peer-reviewed

- 2023 *Algebraic number fields generated by Frobenius-Perron dimensions in fusion rings*  
**Communications in Number Theory and Physics** (to appear)  
Coauthor: Terry Gannon  
*Modular tensor categories, subcategories, and Galois orbits*  
**Transformation Groups**  
Coauthors: Julia Plavnik, Qing Wang, and Zhiqiang Yu  
<https://doi.org/10.1007/s00031-022-09787-9>
- 2022 *Nondegenerate extensions of near-group braided fusion categories*  
**Revista de la Unión Matemática Argentina**: Special Volume: Mathematical Congress of the Americas 2021  
<https://doi.org/10.33044/revuma.2866>  
*Non-pseudounitary fusion*  
**Journal of Pure and Applied Algebra**  
<https://doi.org/10.1016/j.jpaa.2021.106927>
- 2021 *Norm, trace, and formal codegrees of fusion categories*  
**Journal of Algebra**  
<https://doi.org/10.1016/j.jalgebra.2020.10.014>
- 2020 *Prime decomposition of modular tensor categories of local modules of type D*  
**Quantum Topology**  
<https://doi.org/10.4171/qt/140>  
*Lie theory for fusion categories: a research primer*  
**Contemporary Mathematics**: Topological phases of matter and quantum computation  
<https://doi.org/10.1090/conm/747/15036>
- 2019 *Higher Gauss sums of modular categories.*  
**Selecta Mathematica (New Series)**  
Coauthors: Siu-Hung Ng and Yilong Wang  
<https://doi.org/10.1007/s00029-019-0499-2>
- 2018 *Level bounds for exceptional quantum subgroups in rank 2*  
**International Journal of Mathematics**  
<https://doi.org/10.1142/S0129167X18500349>

2017 *Classification of  $\mathfrak{sl}_3$  relations in the Witt group of nondegenerate braided fusion categories*  
**Communications in Mathematical Physics**  
<https://doi.org/10.1007/s00220-017-2831-z>

### Preprints

*Irrational braided generalized near-groups*

arXiv:2212.14009

*Categorification of integral group rings extended by one dimension*

arXiv:2208.07319

*Quadratic  $d$ -numbers*

arXiv:1904.09418

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### Invited Lectures

2023 *Numerical invariants of fusion*

Alberta Number Theory Days XIV – BIRS Workshop (23w2006)

**Banff, Canada**

2022 *Irrational near-groups*

Quantum Symmetries at the CRM

**Montréal, Canada**

*Categorification of integral group rings extended by one dimension*

BIMSA-Tsinghua Quantum Symmetry Seminar

**Beijing, China**

*Modular tensor categories of prime categorical dimension*

Quantum Topology seminar at IU-Bloomington

**Bloomington, United States**

2021 *Nondegenerate extensions of braided near-group fusion categories*

AMS Sectional Meeting – Special Session on Tensor Categories and Applications

**Albuquerque, United States**

*The world is very non-(pseudo)unitary*

BIRS-IASM Workshop (21w5247)

**Hangzhou, China**

*Doubly-rational finite groups.*

Mathematical Congress of the Americas – Special Session on Quantum Symmetries

**Buenos Aires, Argentina**

*Number fields and the quantum subgroup problem*

Wales Mathematical physics-Physical mathematics Seminar

**Cardiff, Wales**

*Fusion rings and their categorifications*

Emergent Research: The PIMS Postdoctoral Fellow Seminar

**Vancouver, Canada**

2020 *Norm, trace, and all that.*

University Quantum Symmetries Zoom Lectures

**Columbus, United States**

- 2019 *Prime factorization of WZW simple current extensions*  
 Modern perspectives of VOAs II  
**Edmonton, Canada**  
*Quadratic  $d$ -numbers.*  
 Intercity Number Theory Seminar  
**Utrecht, Netherlands**  
*Numerical invariants of modular tensor categories.*  
 Subfactors in Sydney  
**Sydney, Australia**
- 2018 *Frobenius-Perron dimensions and fusion subcategories.*  
 BIRS Workshop (18w5195)  
**Banff, Canada**  
*Fields of Frobenius-Perron Dimensions.*  
 Ohio University Mathematics Seminar  
**Athens, United States**
- 2017 *Symmetries of the Weyl alcove.*  
 University of Sydney Algebra Seminar  
**Sydney, Australia**  
*A quantum McKay correspondence.*  
 University of New South Wales Pure Maths Seminar  
**Sydney, Australia**  
*Organizing braided fusion categories.*  
 Australia National University Algebra and Topology Seminar  
**Canberra, Australia**  
*Quantum subgroups after Ostrik.*  
 Conference on Quantum Symmetries: Subfactors and Planar Algebras  
**Kahului, United States**  
*Quantum subgroups of  $SU(n)$ .*  
 AMS Joint Mathematics Meeting – Special Session on Fusion Categories  
**Georgia, United States**
- 2016 *Representations of quantum groups at roots of unity and de-equivariantization.*  
 Uppsala universitet Representation Theory Conference  
**Uppsala, Sweden**

## Teaching

(served as instructor of record unless otherwise indicated)

[University of Alberta](#)

2022 Calculus for the Physical Sciences I

2021 Calculus for the Physical Sciences I

Calculus for the Life Sciences I

[University of New South Wales](#)

2018 Higher Mathematics 1A

[University of Oregon Youth Enrichment and Gifted Program](#)

2013–2015 *Symmetry!*

*Proof without words*  
*Mathematics and Video Games*  
*Binary Numbers and Calculators*

#### University of Oregon

- 2017 *Elementary Discrete Mathematics I* (two sections)  
*Calculus for Business & Social Sciences II*
- 2016 *Several Variable Calculus I*  
*Calculus for the Biological Sciences II*
- 2015 *Calculus for the Biological Sciences I*  
*Fundamentals of Elementary Mathematics III*  
*Introduction to Proof*  
*Calculus for Business & Social Sciences I*
- 2014 *Introduction to Probability & Statistics*  
*Intermediate Algebra*  
*Calculus II*  
*Calculus for Business & Social Sciences II*
- 2013 *Calculus I*  
*Fundamentals of Elementary Mathematics II*  
*Calculus for Business & Social Sciences I*  
*Elementary Functions*
- 2012 *College Algebra*

#### Whatcom Community College

- 2011–2012 *Preparing for the SAT* (three sections)

#### Western Washington University

- 2012 *Precalculus II*
- 2011 *Business Calculus* (two sections)  
*Precalculus I* (two sections)
- 2010 *Functions & Algebraic Methods*

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### Institutional Service

#### Referee for academic journals

- *Journal für die reine und angewandte Mathematik*
- *Communications in Mathematical Physics*
- *Algebras and Representation Theory*
- *Journal of Algebra*
- *Journal of Pure and Applied Algebra*
- *Communications in Algebra*

#### Student supervision

- 2015–2016 Graduate Teaching Mentor, UO Teaching Effectiveness program (paid)

- 2016 Undergraduate Reading Course – Applications of Graph Theory  
Supervised 3 Students, University of Oregon
- 2015 Undergraduate Reading Course – SV decomposition and applications to economics  
Supervised 1 student; thanked in student thesis *Systematic differences between bicyclists and motor-vehicle operators*, University of Oregon, 2016
- 2014–2016 Graduate Student Mentor, UO Mathematics Department (appointed)  
Mentored 4 students
- 2014 Undergraduate Reading Course – Programming in SAGE  
Supervised 1 Student, University of Oregon

#### Organization

- 2022 Focussed research group (22frg002) (lead organizer)  
Banff International Research Station, Banff, Canada
- 2019 Subfactors in Sydney (co-organizer)  
University of New South Wales, Sydney, Australia
- 2015 Oregon Invitational Mathematics Tournament (co-organizer)  
University of Oregon, Eugene, United States

#### Leadership positions

- 2013–2017 Association for Women in Mathematics, University of Oregon chapter, community outreach and undergraduate research committees
- 2012–2016 Graduate representative, University of Oregon Graduate Affairs Committee (elected)
- 2009–2010 Social chairman, Grand Valley State University Math. and Stats. Club (elected)

*Updated: April 10, 2023, Edmonton, Alberta*