Lawrence J. Peterson

January 3, 2024

Educational Background

Ph.D., University of Iowa, Iowa City, IA (1998)
Major: Mathematics
Adviser: Thomas P. Branson
Dissertation: "Conformally Covariant Pseudo-Differential Operators"

M.S., University of North Dakota, Grand Forks, ND (1991)
Major: Mathematics

B.A., University of Minnesota, Minneapolis, MN (1981)
Majors: (1) Computer Science and (2) Arabic Language and Literature

Professional Experience

Associate Professor, University of North Dakota (2004-present)
Assistant Professor, University of North Dakota (1998-2004)
Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, CA, Spring 2001
Teaching Assistant, University of Iowa (1992-1998)
Graduate Teaching Assistant, University of North Dakota (1990-1991)
Programmer/Analyst, NCR Comten, St. Paul, MN (1983-1989)

Courses Taught

Theory of Arithmetic
Introduction to Mathematical Thought
Algebra I & II
Finite Mathematics
Basic Geometry
Trigonometry
College Algebra
Precalculus
Transition to Calculus
Applied Calculus I
Calculus I, II, & III
Introduction to Linear Algebra
Discrete Mathematics (Math 208)
Elementary Differential Equations
Applied Statistical Methods
Set Theory and Logic
Introduction to Partial Differential Equations
Theory of Probability
Geometry (Math 409)
Introduction to Analysis I & II
Abstract Algebra
Linear Algebra
Numerical Analysis
Introduction to Complex Variables
Modern Analysis I & II

Graduate Students

Harison Fanja Andriamasy, M.S., 2017

Service

- **Mathematics Department**

  Chair, Faculty Evaluation Committee (September 2020 – Present)

  M.A.L.L. and Math Learning Center Committee (August 2017 – Present)

  Learning Center Committee (October 2001 – May 2011 and May 2012 – August 2017)

  Library Committee (October 1999 – present)

  Editor for informal *Math Log* newsletter (2004 – present)

  Assessment Committee (August 2009 – August 2011 and August 2017 – August 2019)

  Ad hoc academic grievance committee (May – September 2014)

  Graduate program self-study committee (August 2006 – August 2007)

  Pure Math Committee (August 1998 – August 2004)

  Executive Committee (August 2000 – August 2003)

- **College of Arts and Sciences**

  Program Review Committee (October – November 2023)

  Budget Committee (November 2013 – May 2015)

  Tenure, Reappointment, and Promotions Committee (November 2010 – November 2013)

  Undergraduate program evaluation committee for Geography Department (August 2002 – May 2003)

  Elections Committee (August 2000 – August 2002)

- **University of North Dakota**

  Senator in University of North Dakota Senate (September 2018 – September 2019)

  Senate Summer Session Committee (August 2013 – May 2014)

  Senate Library Committee (August 2000 – August 2005)

  Senate General Education Requirements Committee (August – December 2000)

Research Interests

Differential geometry, geometric analysis, and symbolic computation with computer algebra systems

Refereed Publications

- A.R. Gover, L.J. Peterson, and C. Sleigh, A conformally invariant Yang-Mills type energy and equation on 6-manifolds. Published in online form in *Communications in Contemporary Mathematics*, January 6, 2023. See https://doi.org/10.1142/S021919972250078X.

- A.R. Gover and L.J. Peterson, Conformal boundary operators, T-curvatures, and conformal fractional Laplacians of odd order. *Pacific J. Math.* **311** (2021) no. 2, 277-328.
- A.R. Gover and L.J. Peterson, The ambient obstruction tensor and the conformal deformation complex. *Pacific J. Math.* **226** (2006) no. 2, 309-351.
- A.R. Gover and L.J. Peterson, Conformally invariant powers of the Laplacian, Q-curvature, and tractor calculus. *Comm. Math. Phys.* **235** (2003) no. 2, 339-378.
- L.J. Peterson, Conformally covariant pseudo-differential operators. *Differential Geom. Appl.* **13** (2000) 197-211.

Work Edited

- L.J. Peterson, ed., Future Directions of Research in Geometry: A Summary of the Panel Discussion at the 2007 Midwest Geometry Conference. *SIGMA Symmetry Integrability Geom. Methods Appl.* **3** (2007), Paper 081, 7 pp.

Other Publications

- A. Chang, M. Eastwood, R. Gover, P. Jorgensen, G. Ólafsson, B. Ørsted, P. Yang, L. Peterson, O. Sviderský, W. Ugalde, and D. Hong, "Thomas P. Branson (1953-2006): Professor of Mathematics, University of Iowa." *Acta Appl. Math.* **102** (2008), 127-129.

Unpublished Work

- L.J. Peterson, Software for a Conformally Invariant Yang-Mills Type Energy and Equation on 6-Manifolds, (2022). Datasets. 23. https://commons.und.edu/data/23.
- L.J. Peterson, Software for Conformal Boundary Operators, T-Curvatures, and Conformal Fractional Laplacians of Odd Order, (2019). Datasets. 13. https://commons.und.edu/data/13.

Problem Solutions

- Problem 12383 from the March 2023 issue of the *American Mathematical Monthly*, vol. **130**, no. 3. Solution submitted on July 15, 2023.
- Problem 12312 from the March 2022 issue of the *American Mathematical Monthly*, vol. **129**, no. 3. Solution submitted on July 18, 2022.
- Problem 12233 from the February 2021 issue of the *American Mathematical Monthly*, vol. **128**, no. 2. The journal acknowledged my solution in its December 2022 issue, vol. **129**, no. 10.
- Problem 12178 from the April 2020 issue of the *American Mathematical Monthly*, vol. **127**, no. 4. The journal acknowledged my solution in its January 2022 issue, vol. **129**, no. 1.

- Problem 12161 from the February 2020 issue of the *American Mathematical Monthly*, vol. **127**, no. 2. The journal acknowledged my solution in its October 2021 issue, vol. **128**, no. 8.
- Problem 12035 from the April 2018 issue of the *American Mathematical Monthly*, vol. **125**, no. 4. The journal acknowledged my solution in its December 2019 issue, vol. **126**, no. 10.
- Problem 12032 from the March 2018 issue of the *American Mathematical Monthly*, vol. **125**, no. 3. The journal acknowledged my solution in its December 2019 issue, vol. **126**, no. 10.
- Problem 12028 from the March 2018 issue of the *American Mathematical Monthly*, vol. **125**, no. 3. The journal acknowledged my solution in its November 2019 issue, vol. **126**, no. 9.
- Problem 12020 from the February 2018 issue of the *American Mathematical Monthly*, vol. **125**, no. 2. The journal acknowledged my solution in its October 2019 issue, vol. **126**, no. 8.
- Problem 1245 from the January 2023 issue of the *College Mathematics Journal*, vol. **54**, no. 1. Solution submitted July 3, 2023.
- Problem 1227 from the May 2022 issue of the *College Mathematics Journal*, vol. **53**, no. 3. The journal acknowledged my solution in its May 2023 issue, vol. **54**, No. 3.
- Problem 1216 from the January 2022 issue of the *College Mathematics Journal*, vol. **53**, no. 1. The journal acknowledged my solution in its March 2023 issue, vol. **54**, no. 2.
- Problem 1214 from the November 2021 issue of the *College Mathematics Journal*, vol. **52**, no. 5. The journal acknowledged my solution in its November 2022 issue, vol. **53**, no. 5.
- Problem 1175 from the March 2020 issue of the *College Mathematics Journal*, vol. **51**, no. 2. The journal acknowledged my solution in its March 2021 issue, vol. **52**, no. 2.
- Problem 1150 from the March 2019 issue of the *College Mathematics Journal*, vol. **50**, no. 2. The journal acknowledged my solution in its March 2020 issue, vol. **51**, no. 2.
- Problem 1120 from the January 2018 issue of the *College Mathematics Journal*, vol. **49**, no. 1. The journal acknowledged my solution it its January 2019 issue, vol. **50**, no. 1.

Professional Presentations

- "Tools for Conformal Geometry," Mathematics Colloquium, University of North Dakota, February 23, 2006.

- "Formulas for the Fefferman-Graham Ambient Obstruction Tensor," Workshop on Conformal Geometry, Banff International Research Station, Banff, Alberta, August 1, 2004.
- "A *Mathematica*-Based Approach to Conformal Geometry," Department of Mathematics Seminar, University of Auckland, July 2, 2003.
- "Tensor Calculus with *Mathematica*," Mathematics Colloquium talk, University of Iowa, October 21, 2002.
- "Foundations of Modern Geometry," Undergraduate Colloquium Series, University of North Dakota, April 18 and April 23, 2002.
- "Conformally Covariant Pseudo-Differential Operators," Spectral Invariants Seminar, Mathematical Sciences Research Institute, Berkeley, California (February 7, 2001).
- "Intrinsic Geometric Structures," Undergraduate Colloquium Series, University of North Dakota, September 14, 2000.
- "Conformally Covariant Pseudo-Differential Operators," University of Washington, Seattle (April 2, 1999).
- "Conformally Covariant Pseudo-Differential Operators," North Dakota State University, Fargo (February 4, 1999).
- "Conformally Covariant Pseudo-Differential Symbols," Joint Mathematics Meetings, Baltimore, Maryland (January 8, 1998).
- "Series with Weights Tending to Infinity," North Central Section meeting of the Mathematical Association of America, Bemidji, Minnesota (October 19, 1991).

Grants and Contracts

- **Grant Proposals Submitted**

  Co-Principal Investigator, NSF grant proposal DMS-0604791, Noncommutative Residues and Conformal Covariants (November 2005, declined)

  Co-Principal Investigator, NSF grant proposal DMS-0505426, Noncommutative Residues and Conformal Covariants (November 2004, declined)

- **Funded Grants**

  Principal Investigator, NSF grant DMS-0202812, Midwest Geometry Conference: 2002-2004.

Professional Education/Consultant Activities

- Scientific committee member for the 2007 Midwest Geometry Conference, May 18-20, 2007, Iowa City, Iowa.
- Attended a portion of the workshop "Symmetries and Overdetermined Systems of Partial Differential Equations" at the Institute for Mathematics and Its Applications, Minneapolis, Minnesota, July 17-August 4, 2006.
- Attended 2006 Midwest Geometry Conference, Norman, Oklahoma, May 5-7, 2006.
- Attended 2005 Midwest Geometry Conference, Columbus, Ohio, April 29-May 1, 2005. Moderator for special session on Future Directions of Geometry.
- Invited participant at workshop on "Conformal Geometry" held at the Banff International Research Station, Banff, Alberta, July 31-August 5, 2004.
- Attended 2004 Midwest Geometry Conference, Fayetteville, Arkansas, March 25-27, 2004. Co-moderator for special session on Future Directions of Geometry.
- Invited participant at workshop on "Conformal Structure in Geometry, Analysis, and Physics" held at the American Institute of Mathematics, Palo Alto, California, August 12-16, 2003.
- Managing organizer for the Twelfth Midwest Geometry Conference, Grand Forks, North Dakota, April 26-28, 2002.
- Organizing committee member for the Tenth Midwest Geometry Conference, Iowa City, Iowa, November 17-19, 2000.
- Attended four-week workshop on harmonic analysis at University of Wisconsin-Madison sponsored by the Institute for Mathematics and its Applications (summer 1996).
- Attended similar four-week IMA workshop on differential geometry at University of Illinois at Urbana-Champaign (summer 1995).