

Alex Waldron

CONTACT INFORMATION UW-Madison Department of Mathematics waldron@math.wisc.edu
Van Vleck Hall
480 Lincoln Drive
Madison, WI 53706

EMPLOYMENT **University of Wisconsin - Madison**
Assistant Professor (2020 -)

Michigan State University
Visiting Assistant Professor (2018 - 2020)

Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics
Postdoctoral Researcher (2017 - 18)

Simons Center for Geometry and Physics, Stony Brook University
Research Assistant Professor (2014 - 18).

EDUCATION **Columbia University**
M.A. (2011), Ph.D. (2014)

Harvard University
B.A. cum laude in Mathematics and Physics, with high honors (2008).

RESEARCH INTERESTS Geometric flows, gauge theory, differential geometry.

PUBLICATIONS AND ARXIV PREPRINTS C. Song and A. Waldron *Harmonic map flow with low $\bar{\partial}$ -energy*, arXiv:2009.07242, submitted.

A. Waldron, *G₂-instantons on the 7-sphere*, arXiv:2002.02386, submitted.

G. Oliveira and A. Waldron, *Yang-Mills flow on special-holonomy manifolds*, *Advances in Mathematics* 376, 107418 (2020).

A. Waldron, *Uhlenbeck compactness for Yang-Mills flow in higher dimensions*, arXiv:1812.10863, submitted.

A. Waldron, *Long-time existence for Yang-Mills flow*, *Inventiones mathematicae* 217 (3), 1069-1147 (2019).

A. Waldron, *Instantons and singularities in the Yang-Mills flow*, *Calc. Var. PDE* 55.5 (2016), 1-31.

Y. Roichman, A. Waldron, E. Gardel, D. G. Grier, *Optical traps with geometric aberrations*, *Applied Optics* 45.15 (2006), 3425-3429.

THESES

A. Waldron, *Self-duality and singularities in the Yang-Mills flow*, Ph.D. Thesis (2014), 5 Chapters. Advised by Panagiota Daskalopoulos.

A. Waldron, *Fano varieties of low-degree smooth hypersurfaces and unirationality*, Harvard senior thesis (2008). Advised by Joe Harris.

CONFERENCE
TALKS

AMS Special Session on Geometry of Gauge-Theoretic Moduli Spaces, Gainesville, November 2019

Special holonomy: progress and problems, SCGP, September 2019

Workshop on Geometric Analysis, Xiamen University, June 2019

Geometric Flows and Special Holonomy, Imperial College, June 2018

CMS Geometric Analysis Session, Waterloo, ON, December 2017

Workshop on Recent Developments in the Mathematical study of Gauge Theory, SCGP, October 2016

Geometry, Topology, and Dynamics of Moduli Spaces, National University of Singapore, August 2016

Workshop on Nonlinear Evolution Problems, Mathematisches Forschungsinstitut Oberwolfach, May-June 2016

AMS Special Session on Floer Homology, Gauge Theory, and Symplectic Geometry, Michigan State University, March 2015

MIT Talbot Workshop on Nonabelian Hodge Theory, April 2011.

OTHER INVITED
TALKS

UCSD geometry seminar, April 2020

Central Michigan geometry seminar, January 2020

UW Madison colloquium, December 2019

Harvard gauge theory seminar, October 2019

MSU geometry and topology seminar, September 2019

Duke differential geometry seminar, October 2018

MSU analysis and PDE seminar, September 2018

MSU geometry and topology seminar, September 2018

New York Hungarian Scientific Society, public lecture, June 2018

CUNY differential geometry seminar, March 2018

McGill geometry seminar, January 2018

MIT geometry and topology seminar, September 2017

Chinese Academy of Sciences, Beijing, May 2017

Harvard differential geometry seminar, February 2017

University of Maryland informal differential geometry seminar, February 2017

Stony Brook geometry and topology seminar, February 2017

Columbia geometry and analysis seminar, November 2016

Oxford PDE CDT seminar, October 2016

Université Libre de Bruxelles differential geometry seminar, May 2016

Mini-course *Introduction to the Yang-Mills Equations on Riemann Surfaces* (8 hours), USTC, Hefei, July 2015

UC Irvine differential geometry, April 2015

Stony Brook geometry and topology seminar, November 2014.

TEACHING
EXPERIENCE

| | | |
|--------|------|--|
| Spring | 2021 | Instructor, Theory of single-variable calculus (Math 421), UW Madison |
| Fall | 2020 | Instructor, Differential equations and linear algebra (Math 320), UW Madison |
| Spring | 2020 | Instructor, Complex Manifolds (MTH 935), MSU |
| Fall | 2019 | Instructor, Calculus I (x2), MSU |
| Spring | 2019 | — |
| Fall | 2018 | Instructor, Calculus III (AP Section), MSU |
| Spring | 2017 | Instructor, Calculus A, Stony Brook |
| Spring | 2016 | — |
| Spring | 2015 | — |
| Spring | 2012 | Instructor/organizer, Calculus II, Columbia |
| Fall | 2011 | Supervisor/organizer, Undergraduate Seminar (MATH V3951), Columbia. |

SERVICE

Co-organizer, Informal Geometric Analysis Seminar, MSU, 2018-19

Organizer, Reading Seminar in Geometric Analysis, Stony Brook, 2015-16

Co-organizer, Graduate Analysis Seminar, Columbia, 2014

Referee for:

Calculus of Variations and Partial Differential Equations
 Geometry and Topology
 Communications in Mathematical Physics
 Journal of the American Mathematical Society
 Transactions of the American Mathematical Society.
 Journal of Geometric Analysis.

LANGUAGES

English, French, Hebrew.

REFERENCES

Simon Donaldson, Permanent member, SCGP, and Royal Society Research Professor, Imperial College, 631-632-2864, sdonaldson@scgp.stonybrook.edu

Panagiota Daskalopoulos, Professor, Department of Mathematics, Columbia University, 212-854-4756, pdaskalo@math.columbia.edu

Xiuxiong Chen, Professor, Department of Mathematics, Stony Brook University, 631-632-8327, xiu@math.stonybrook.edu

Michael Struwe, Professor, Department of Mathematics, ETH Zurich, +41-44-632-33-77, michael.struwe@math.ethz.ch

Thomas Parker, Professor, Department of Mathematics, Michigan State University, 517-353-8493, parker@msu.edu

Tsvetanka Sendova, Academic specialist, Department of Mathematics, Michigan State University, 517-884-1453, tsendova@msu.edu (teaching).