Alex Waldron

Contact information	UW-Madison Department of Mathematics 313 Van Vleck Hall 480 Lincoln Drive Madison, WI 53706	`waldron@math.wisc.edu`

Employment

University of Wisconsin - Madison
Assistant Professor (2020 -)

UC Berkeley
Visiting Scholar (Fall 2022)

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

A. Waldron, *Strict type-II blowup in harmonic map flow*, arXiv:2112.14255, submitted.

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

A. Waldron, *G_2-instantons on the 7-sphere*, arXiv:2002.02386, accepted in Journal of the London Mathematical Society.

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.

GRANTS   NSF DMS-2004661, "Yang-Mills flow and applications," 2020-2023.

CONFERENCE TALKS

Kansas Geometry Day, November 2022

Introductory Workshop: Analytic and Geometric Aspects of Gauge Theory, MSRI, August-September 2022

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

Princeton differential geometry and geometric analysis seminar, November 2022

U Chicago geometric analysis seminar, March 2022

U Minnesota geometry seminar, February 2022

Online geometric analysis seminar (global), August 2021

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*, USTC, Hefei, July 2015

UC Irvine differential geometry, April 2015

Stony Brook geometry and topology seminar, November 2014.

Teaching
experience

Spring	2022	Instructor, Topics in differential geometry (Math 865), UW-Madison
Fall	2021	Instructor, Calculus and analytic geometry I (Math 221), UW-Madison
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

Organizer, Geometry-Topology Seminar, UW-Madison, 2021-22

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).