

# Thomas Walpuski

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## Education

- 2009–2013 **PhD**, *Imperial College London*, thesis advisor: Simon Donaldson.
- 2007–2009 **MSc**, *ETH Zürich*.
- 2005–2007 **BSc**, *ETH Zürich*.

## Academic Positions

- 2017–present **Assistant Professor (tenure-track)**, *Michigan State University*.
- 2015–2017 **C.L.E. Moore Instructor**, *Massachusetts Institute of Technology*.
- 2014 **Research Assistant Professor**, *Simons Center for Geometry and Physics*.
- 2013–2014 **Research Associate**, *Imperial College London*.

## Grants, Fellowships, and Prizes

- 2018–2019 **Sloan Research Fellowship**, \$65'000.
- 2017–2020 **NSF DMS-1754967**, *Gauge Theory on Manifolds with Special Holonomy*, PI, \$152'000.
- 2016–2017 **MIT–Brazil Seed Fund**, *Singular  $G_2$ -instantons over Twisted Connected Sums*, co-PI with Tomasz Mrowka and Henrique Sá Earp, \$15'000 from MIT and \$15'000 from FAPESP.
- 2009 **ETH Medal for outstanding master thesis**.
- 2009 **Willi Studer Prize for best diploma**.

## Research Interests

gauge theory, special holonomy, calibrated geometry, geometric analysis, algebraic geometry

## Publications

- A. Doan and T. Walpuski. *On the existence of harmonic  $Z_2$  spinors*. **Journal of Differential Geometry** (2018). arXiv: 1710.06781. to appear.
- A. Jacob, H. N. Sá Earp, and T. Walpuski. *Tangent cones of Hermitian Yang–Mills connections with isolated singularities*. **Mathematical Research Letters** (2018). arXiv: 1603.07702. to appear.
- A. Jacob and T. Walpuski. *Hermitian Yang–Mills metrics on reflexive sheaves over asymptotically cylindrical Kähler manifolds*. **Communications in Partial Differential Equations** (2018). arXiv: 1603.07702. to appear.
- D. A. Salamon and T. Walpuski. *Notes on the octonions*. **Proceedings of the 23rd Gökova Geometry–Topology Conference**. (2017). arXiv: 1005.2820.
- T. Walpuski.  *$G_2$ -instantons, associative submanifolds, and Fueter sections*. **Communications in Analysis and Geometry** 25.4 (2017). arXiv: 1205.5350.
- T. Walpuski. *A compactness theorem for Fueter sections*. **Commentarii Mathematici Helvetici** 92.4 (2017). arXiv: 1507.03258.

A. Degeratu and T. Walpuski. *Rigid HYM connections on tautological bundles over ALE crepant resolutions in dimension three.*

**Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)** 12.17 (2016). arXiv: 1207.6938.

T. Walpuski. *Spin(7)-instantons, Cayley submanifolds, and Fueter sections.*

**Communications in Mathematical Physics** 352.1 (2016). arXiv: 1409.6705.

A. Haydys and T. Walpuski. *A compactness theorem for the Seiberg–Witten equation with multiple spinors in dimension three.*

**Geometric and Functional Analysis** 25.6 (2015). arXiv: 1406.5683.

H. N. Sá Earp and T. Walpuski.  *$G_2$ -instantons over twisted connected sums.*

**Geometry and Topology** 19.3 (2015). arXiv: 1310.7933.

T. Walpuski.  *$G_2$ -instantons over twisted connected sums: an example.*

**Mathematical Research Letters** 23.2 (2015). arXiv: 1505.01080.

T. Walpuski.  *$G_2$ -instantons on generalised Kummer constructions.*

**Geometry and Topology** 17.4 (2013). arXiv: 1109.6609.

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## Preprints

A. Doan and T. Walpuski. *Castelnuovo’s bound and rigidity in almost complex geometry.* (2018). arXiv: 1809.04731.

A. Doan and T. Walpuski. *Equivariant Brill–Noether theory for elliptic operators and super-rigidity of  $J$ -holomorphic maps.* (2018).

A. Doan and T. Walpuski. *Deformation theory of the blown-up Seiberg–Witten equation in dimension three.* (2017). arXiv: 1704.02954.

A. Doan and T. Walpuski. *On counting associative submanifolds and Seiberg–Witten monopoles.* (2017). arXiv: 1712.08383.

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## Invited Talks

### Conferences and Workshops

December 2018 **ICMAT**, *School and Workshop on Special Metrics and Gauge Theory.*

November 2018 **Rutgers University**, *Geometric Analysis Workshop.*

September 2018 **Simons Center for Geometry and Physics**, *Special Holonomy: Progress and Open Problems.*

June 2018 **ShanghaiTech**, *Symposium in Geometry and Differential Equations.*

January 2018 **Imperial College London**, *Gauge Theory and Special Holonomy.*

September 2017 **Simons Center for Geometry and Physics**, *Special Holonomy: Progress and Open Problems.*

August 2017 **Fields Institute**,  *$G_2$  Manifolds and Related Topics*, workshop and mini-school.

August 2017 **Isaac Newton Institute**, *Symplectic Geometry—Celebrating the work of Simon Donaldson.*

March 2017 **Institute for Pure and Applied Mathematics (IPAM)**, *Gauge Theory and Categorification.*

December 2016 **Toyko Institute of Technology and Tokyo University of Science**, *Geometric Analysis in Geometry and Topology.*

September 2016 **Simons Center for Geometry and Physics**, *Special Holonomy in Geometry, Analysis and Physics.*

June 2016 **Isaac Newton Institute**, *General Relativity: from Geometry to Amplitudes.*

May/June 2016 **Gökova Geometry–Topology Conference.**

November 2015 **Simons Center for Geometry and Physics**, *Riemannian Convergence Theory.*

- July 2015 **University of British Columbia**, *PIMS Symposium on the Geometry and Topology of Manifolds*.
- September 2014 **Simons Center for Geometry and Physics**,  *$G_2$ -manifolds*, month-long program.
- August 2014 **Riemann Center for Geometry and Physics, Leibniz Universität Hannover**, *Gauge Theories in Higher Dimensions*.
- June 2012 **King's College London and University College London**,  *$G_2$  Days*.
- April 2012 **Banff International Research Station**, *Geometric Structures on Manifolds*.
- January 2011 **King's College London**, *UK–Japan Winter School New Methods in Geometry*.
- Seminars**
- November 2018 **University of Michigan**, *Geometric and Physics Seminar*.
- November 2018 **Notre Dame**, *PDE, Complex Analysis and Differential Geometry Seminar*.
- November 2016 **Center of Mathematical Sciences and Applications, Harvard University**, *Mathematical Physics Seminar*.
- June 2016 **Universidad Complutense Madrid**, *Seminario de geometría y topología*.
- March 2016 **Fields Institute**, *Fields Geometric Analysis Colloquium*.
- November 2015 **Harvard University**, *Gauge Theory Seminar*.
- October 2015 **Harvard University**, *Differential Geometry*.
- October 2015 **Michigan State University**, *Topology Seminar*.
- October 2015 **California Institute of Technology**, *Geometry and Topology Seminar*.
- October 2015 **Massachusetts Institute of Technology**, *Geometry and Topology Seminar*.
- April 2015 **Harvard University**, *Differential Geometry Seminar*.
- April 2015 **Duke University**, *Geometry/Topology Seminar*.
- March 2015 **Waterloo University**, *Geometry and Topology Seminar*.
- November 2014 **Princeton University**, *Tian's informal seminar*.
- June 2014 **Imperial College London**, *Geometry and Topology Seminar*.
- April 2014 **ETH Zürich**, *Symplectic Geometry Seminar*.
- March 2014 **Cambridge University**, *Differential Geometry Seminar*.
- December 2013 **EPF Lausanne**, *Hamiltonian Dynamics Seminar*.
- November 2013 **Leeds University**.
- November 2013 **Kyoto University**.
- October 2013 **Instituto de Matemática Pura e Aplicada (IMPA)**.
- September 2013 **Unicamp**.
- May 2013 **University of Bielefeld**.
- February 2012 **University of Freiburg**.
- January 2012 **Imperial College London**, *Geometry and Analysis Seminar*.

## Teaching

### Michigan State University

- Fall 2018 MTH 993 Special Topics in Geometry: Riemannian Manifolds with Special Holonomy
- Spring 2018 MTH 993 Special Topics in Geometry: Spin Geometry
- Fall 2017 MTH 868 Geometry and Topology I

### Massachusetts Institute of Technology

- Spring 2017 18.901 Introduction to Topology
- Fall 2016 18.965 Geometry of Manifolds
- Spring 2016 18.152 Introduction to Partial Differential Equations

Fall 2015 18.03 Differential Equations (recitations)

Spring 2015 18.03 Differential Equations (recitations)

[Imperial College London](#)

Spring 2014 M4P54 Differential Topology

Spring 2011 Mathematics for Electrical Engineers (tutorials)

[ETH Zürich](#)

Fall 2008 Analysis I (tutorials)

Spring 2008 Linear Algebra II (tutorials)

Fall 2007 Linear Algebra I (tutorials)

Summer 2007 Analysis II (tutorials)

Winter 2006/07 Analysis I (tutorials)

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## References

### **Simon Donaldson**

Simons Center for Geometry and Physics

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### **Clifford Taubes**

Harvard University

✉ [chtaubes@math.harvard.edu](mailto:chtaubes@math.harvard.edu)

### **Tomasz Mrowka**

Massachusetts Institute of Technology

✉ [mrowka@math.mit.edu](mailto:mrowka@math.mit.edu)

### **Mark Haskins**

Imperial College London

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### **Dietmar Salamon**

ETH Zürich

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### **Jörn Dunkel (teaching)**

Massachusetts Institute of Technology

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