

Benjamin C. Sibley

Curriculum Vitae

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Date of Birth

6 June, 1985

Education

- **Graduate (2007-2013)**

PhD. Student – Pure Mathematics (Supervisor Richard Wentworth)

The University of Maryland College Park

- **Undergraduate (2003-2006)**

The University of Illinois at Urbana-Champaign

Urbana-Champaign, Illinois

December, 2006

- **Postgraduate programme in applied artificial intelligence (2021-2022)**

Erasmushogeschool Brussel/Vrije Universiteit Brussel

(Introduction to data science and machine learning in Python)

- **Degrees**

Bachelor of Science with Distinction in Mathematics (Illinois, Urbana-Champaign)

Master of Arts in Mathematics May 2010 (Maryland, College Park)

PhD in Mathematics June 2013 (Maryland, College Park)

Employment

- Chargé de recherches, Fonds national de la recherche scientifique, Université Libre de Bruxelles (September 2019-September 2022)
- Research Assistant Professor, Simons Center for Geometry and Physics (September 2016-September 2019)
- Postdoc, Université Libre de Bruxelles (September 2014-September 2016)
- Postdoc, Max Planck Institut für Mathematik (September 2013-September 2014)

Visiting positions

- Kavli IPMU, Tokyo (December 2019-January 2020)

Research

Complex geometry and gauge theory and related areas of algebraic geometry and geometric analysis. Moduli spaces of Hermitian-Yang-Mills connections, holomorphic vector bundles and sheaves. Geometric flows and canonical metrics.

Publications and preprints

1. "Long-time existence for the Calabi flow on ruled manifolds over Riemann surfaces" (Preprint, 111 pages).
2. "Continuity of the Yang-Mills flow on the set of semistable bundles" (with Richard Wentworth), Pure and Applied Mathematics Quarterly 17 (2021), No. 3, pp. 909-931 (see also arxiv1904.02312).

3. "Complex algebraic compactifications of Hermitian-Yang-Mills moduli space" (with Daniel Greb, Matei Toma, and Richard Wentworth), *Geometry & Topology* 25 (2021), no. 4, 1719–1818. MR 4286363, (see also arXiv:1810.00025).

4. "Analytic cycles, Bott-Chern forms, and singular sets for the Yang-Mills flow on Kähler manifolds" (with Richard Wentworth), *Advances in Mathematics*, 279 (2015), 501-531. See also arXiv:1402.3808.

5. "Asymptotics of the Yang-Mills flow for holomorphic vector bundles over Kähler manifolds: the canonical structure of the limit", *Journal für die reine und angewandte Mathematik (Crelle's Journal)*, Volume 2015, Issue 706, Pages 123–191. See also arXiv:1206.5491v4.

Work in progress

1. "Glueing holomorphic bundles on Calabi-Yau threefolds" (working title, joint with Alexander Doan and Yuuji Tanaka)

Refereeing work

Geometriae Dedicata, *The Journal of Topology*, *Advances in Mathematics*, *Duke Mathematical Journal*, *Geometry and Topology*.

Invited Talks

Compactifications of Hermitian-Yang-Mills moduli space and the Yang-Mills flow on projective manifolds, Institut de Mathématiques de Marseille Complex Geometry Seminar (October 2021)

Compactifications of Hermitian-Yang-Mills moduli space and the Yang-Mills flow on projective manifolds, University of York Geometry, Analysis and Mathematical Physics seminar (October 2020)

Compactifications of Hermitian-Yang-Mills moduli space and the Yang-Mills flow on projective manifolds, Mathematics and String Theory Seminar, Kavli IPMU Tokyo (December 2019)

Compactifications of Hermitian-Yang-Mills moduli space and the Yang-Mills flow on projective manifolds, University of Cambridge Algebraic Geometry Seminar (November 2019)

Compactifications of Hermitian-Yang-Mills moduli space and the Yang-Mills flow on pro-

jective manifolds, Université Libre de Bruxelles, Differential Geometry Seminar (October 2019)

Geometric flows and moduli spaces on Kahler manifolds, Bronx Community College, City University of New York, (job talk May 2019)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, Differential Geometry Seminar, Tokyo Institute of Technology (April 2019)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, CUNY Kahler Geometry Workshop, City-Tech, City University of New York (January 2019)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, Essener Oberseminar für Algebraische Geometrie und Arithmetik, Universität Duisberg-Essen (July 2018)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, Vector Bundles on Algebraic Curves, CIRM Marseilles (June 2018)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, École Polytechnique, Paris (June 2018)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, AMS Special Session on Hermitian Geometry, Vanderbilt University, Nashville (April 2018)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, Simons Collaboration on Special Holonomy (Gauge Theory and Special Holonomy), Imperial College London (January 2018)

Complex algebraic compactifications of Hermitian-Yang-Mills moduli space, Université Libre de Bruxelles (June 2017)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, University of Waterloo, (March 2017)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, Recent developments in Mathematical Gauge Theory, SCGP Stony Brook (October 2016)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, Stony Brook capsule research talk, Stony Brook University (September 2016)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, IAP Dygest Annual Meeting, KU Leuven (April 2015)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, Université Libre de Bruxelles, Differential Geometry Seminar (October 2014)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, Institute for Mathe-

mathematical Sciences/National University of Singapore (July 2014)

Limits and bubbling sets for the Yang-Mills flow on Kähler manifolds, LMU München Oberseminar, (April 2014)

Asymptotics of the Yang-Mills flow on Kähler manifolds, Université Libre de Bruxelles, FNRS Contact Group in Differential Geometry (September 2013)

Asymptotics of the Yang-Mills flow on Kähler manifolds, Princeton University, Differential Geometry Seminar (May 2013)

Asymptotics of the Yang-Mills Flow on Kähler Manifolds, Geometric Analysis seminar, University of Maryland, College Park (November, 2012)

Teaching

Université Libre de Bruxelles (2020-2021)

Géométrie Différentielle (Differential Geometry, taught in French) Autumn 2020

Manifolds, submanifolds, vector fields and flows

Université Libre de Bruxelles (2019-2020)

Espaces fonctionnels et analyse de Fourier (Functional spaces and Fourier Analysis, taught in French) exercise course, (Spring 2020)

Fourier Transform, Distributions, and Hilbert spaces

Stony Brook University, (2016-2018)

Math 131 (lecturer) Calculus I (Autumn 2016)

Math 131 (lecturer) Calculus I (Autumn 2017)

Math 132 (lecturer) Calculus II (Autumn 2018)

University of Maryland, College Park (2007-2013)

Math 140	Calculus I (Autumn 2007) (teaching assistant)
Stat 100	Introductory Statistics (Autumn 2008) (lecturer)
Math 241	Calculus III (Autumn 2009/2010 and Spring 2012) (teaching assistant)
Math 240	Linear Algebra (Spring 2010) (teaching assistant)
Math 111	Introductory Probability (Spring 2008/2009) (lecturer)
Math 734/ 640 (Spring 2013)	Graduate courses on complex analysis and algebraic topology (grader)

References

Richard Wentworth (Advisor)

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Daniel Greb

daniel.greb@uni-due.de

Joel Fine

joel.fine@ulb.ac.be

Matei Toma

matei.toma@univ-lorraine.fr

Simon Donaldson

sdonaldson@scgp.stonybrook.edu

Alexander Kirillov (teaching)

kirillov@math.sunysb.edu

Jonathan Rosenberg (teaching)

jmr@math.umd.edu

Languages

English (native)

French (fluent, C1-C2 according to the CEFR)

German (advanced)

Dutch (elementary)

Programming languages

Python

Other skills

Latex, Scientific Workplace