Aleksander Doan

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RESEARCH INTERESTS

differential geometry, gauge theory, symplectic geometry, low-dimensional topology

EMPLOYMENT

2022—   **University College London**

Lecturer in Pure Mathematics

2019—   **Trinity College, University of Cambridge**

Junior Research Fellow

2019—2022   **Columbia University**

Junior Fellow of the Simons Society

EDUCATION

2014—2019   **Stony Brook University**

PhD in Mathematics. Advisor: Simon Donaldson

2013—2014   **Trinity College, University of Cambridge**

Part III of the Mathematical Tripos

2012—2013   **University of Bonn**

The Erasmus Programme

2009—2012   **University of Warsaw**

BA in Mathematics

AWARDS & FELLOWSHIPS

Fall 2022	Research Member of the Mathematical Sciences Research Institute, Berkeley
2021—2024	National Science Foundation grant DMS-2104919 ($158,856)
2019	Stony Brook University President's Award to Distinguished Doctoral Students
2019	Department Award for Outstanding Research by a PhD Student, Stony Brook University
2017—2019	Funded by Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics
2013—2014	Trinity College Studentship in Mathematics, University of Cambridge

PREPRINTS

2021	The Gopakumar–Vafa finiteness conjecture – with E. Ionel and T. Walpuski
	preprint, `arXiv:2103.08221`

2020	Equivariant Brill–Noether theory for elliptic operators and super-rigidity – with T. Walpuski
	preprint, `arXiv:/2006.01352`

PUBLICATIONS

2022	Counting embedded curves in symplectic 6–manifolds – with T. Walpuski
	to appear in *Commentarii Mathematici Helvetici*

2020	Deformation theory of the blown-up Seiberg–Witten equation in dimension three – with T. Walpuski
	Selecta Mathematica 26, 48 (2020)

2019	Castelnuovo's bound and rigidity in almost complex geometry – with T. Walpuski
	to appear in *Advances in Mathematics*

2019	On counting associative submanifolds and Seiberg–Witten monopoles – with T. Walpuski
	Pure and Applied Mathematics Quarterly, 15.4 (2019) pp. 1047–1133

2019	Seiberg–Witten monopoles with multiple spinors on a surface times a circle
	Journal of Topology 12 (2019), no. 1, 1–55

2018	On the existence of harmonic $\mathbb{Z}/2$ spinors – with T. Walpuski
	to appear in *Journal of Differential Geometry*

2018	Adiabatic limits and Kazdan–Warner equations
	Calculus of Variations and PDE (2018) 57:124

INVITED TALKS

CONFERENCES

2021	*Rutgers Geometric Analysis Conference*, Rutgers University
2020	*Oxford–London Gauge Theory Assembly*, University of Oxford
2020	*Geometry and Analysis of Moduli Spaces*, Imperial College London
2019	*Novel Vistas on Vortices*, Simons Center
2019	*Third Annual Meeting of the Simons Collaboration on Special Holonomy*, New York
2018	*Special Metrics and Gauge Theory*, Instituto de Ciencias Matemáticas, Madrid
2018	*Gauge Theory and Special Holonomy*, Imperial College London
2017	*Special Holonomy: Progress and Open Problems*, Simons Center
2017	*Gauge Equations, Geometry, and Strings*, Instituto de Ciencias Matemáticas, Madrid
2016	*Recent Developments in the Mathematical Study of Gauge Theory*, Simons Center

RESEARCH SEMINARS

2022	*M-Seminar*, Kansas State University
2022	*Symplectic Geometry Seminar*, Institute for Advanced Study, Princeton
2022	*Geometry and Topology Seminar*, University of Wisconsin–Madison
2022	*Northern California Symplectic Geometry Seminar*, Stanford University
2022	*Math Department Colloquium*, Michigan State University
2022	*Math Department Colloquium*, University of Southern California
2022	*Math Department Colloquium*, Rutgers University
2021	*Geometric Analysis Colloquium*, Fields Institute
2021	*Geometric Analysis Seminar*, University of Oregon

INVITED TALKS (CONTINUED)

2021	*Enumerative Geometry Seminar*, Columbia University	
2021	*Topology Seminar*, Texas A&M University	
2021	*Differential Geometry Seminar*, UC Santa Barbara	
2021	*Gauge Theory Virtual Seminar*	
2021	*Freemath Virtual Seminar*	
2021	*Geometric Analysis Seminar*, University of Chicago	
2020	*Symplectic Geometry Seminar*, Stanford University	
2020	*Geometry & Topology Seminar*, Michigan State University	
2020	*Symplectic Dynamics/Geometry Seminar*, Institute for Advanced Study, Princeton	
2019	*Topology Seminar*, Peking University	
2019	*Department of Mathematics Colloquium*, National Cheng Kung University, Tainan	
2019	*Geometry & Topology Seminar*, Duke University	
2019	*Geometry & Topology Seminar*, Massachusetts Institute of Technology	
2019	*Gauge Theory and Symplectic Geometry Seminar*, Columbia University	
2019	*Geometric Analysis Seminar*, Rutgers University	
2019	*Geometry Seminar*, University of Rochester	
2018	*Topology Seminar*, Brandeis University	
2018	*Geometry Seminar*, Stanford University	
2018	*Differential Geometry Seminar*, UC Berkeley	
2018	*Gauge–Topology–Symplectic Seminar*, Harvard University	
2018	*Almost Complex Geometry Seminar*, City University of New York	
2018	*Geometry & Topology Seminar*, Michigan State University	
2018	*Geometry Seminar*, Stanford University	
2018	*Topology Seminar*, Princeton University	
2017	*Geometry & Topology Seminar*, Massachusetts Institute of Technology	
2017	*Geometric Analysis Seminar*, Institute of Mathematical Sciences, Hong Kong	
2017	*Geometry & Topology Seminar*, Duke University	
2017	*Geometry & Topology Seminar*, Stony Brook University	

TEACHING & MENTORSHIP

2021—	PhD coadvisor of Emily Windes (University of Rochester)
2021	Instructor for Ordinary Differential Equations at Columbia University
2019	Lecturer for a mini-course on gauge theory for graduate students at Peking University
2019	Teaching Assistant at the PCMI 2019 Graduate Summer School
2014—2019	Teaching Assistant, Stony Brook University *Courses:* Calculus I (three semesters), Calculus II, Calculus IV, Analysis I, Geometry and Topology II (two semesters), History of Mathematics
2014—2019	Tutor at the Mathematics Learning Center, Stony Brook University
2018	Lecturer at the Stony Brook Math Summer Camp for high school students

PROFESSIONAL ACTIVITIES

2022	Service on a National Science Foundation proposal review panel
2022	Lead organizer of the *Introductory Workshop: Analytic and Geometric Aspects of Gauge Theory*, Mathematical Sciences Research Institute, Berkeley
2020	Coorganizer of the conference *Geometry and Analysis of Moduli Spaces*, Imperial College London
2017—	Referee for the peer-reviewed journals: *Advances in Mathematics*, *Communications in Analysis and Geometry*, *International Mathematics Research Notices*, *Pacific Journal of Mathematics*, *Mathematics Research Letters*

REFERENCES

Simon Donaldson (PhD advisor)
Simons Center for Geometry and Physics
✉ sdonaldson@scgp.stonybrook.edu

Kenji Fukaya
Simons Center for Geometry and Physics
✉ kfukaya@scgp.stonybrook.edu

Rafe Mazzeo
Stanford University
✉ mazzeo@math.stanford.edu

Clifford Taubes
Harvard University
✉ chtaubes@math.harvard.edu

George Dragomir (teaching)
Columbia University
✉ dragomir@math.columbia.edu