

Aleksander Doan

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RESEARCH INTERESTS

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

EMPLOYMENT

from 2022 **University College London**
Lecturer in Pure Mathematics

from 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

- 2022 Holomorphic Floer theory and the Fueter equation
with Semon Rezchikov, [arXiv:2210.12047](#)
- 2021 The Gopakumar–Vafa finiteness conjecture
with Eleny Ionel and Thomas Walpuski, [arXiv:2103.08221](#)

PUBLICATIONS

- 2020 Equivariant Brill–Noether theory for elliptic operators and super-rigidity
with Thomas Walpuski, *Forum of Mathematics, Sigma*
- 2022 Counting embedded curves in symplectic 6–manifolds
with Thomas Walpuski, *Commentarii Mathematici Helvetici*
- 2021 Castelnovo’s bound and rigidity in almost complex geometry
with Thomas Walpuski, *Advances in Mathematics*
- 2021 On counting associative submanifolds and Seiberg–Witten monopoles
with Thomas Walpuski, *Pure and Applied Mathematics Quarterly*
- 2021 On the existence of harmonic $\mathbb{Z}/2$ spinors
with Thomas Walpuski, *Journal of Differential Geometry*
- 2020 Deformation theory of the blown-up Seiberg–Witten equation in dimension three
with Thomas Walpuski, *Selecta Mathematica*
- 2019 Seiberg–Witten monopoles with multiple spinors on a surface times a circle
Journal of Topology
- 2018 Adiabatic limits and Kazdan–Warner equations
Calculus of Variations and PDE

INVITED TALKS

CONFERENCES

- 2022 *New Four-Dimensional Gauge Theories*, Mathematical Sciences Research Institute, Berkeley
- 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

INVITED TALKS (CONTINUED)

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
- 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