

JOHN BENJAMIN MCCARTHY

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RESEARCH INTERESTS

Gauge theory, complex differential and algebraic geometry, the construction and study of moduli spaces, the study of stability and stability conditions for varieties, bundles, and sheaves such as K-stability and Bridgeland stability, mirror symmetry and the relations of the aforementioned areas to mathematical physics, the study of canonical metrics on bundles and varieties such as Hermite–Einstein metrics and constant scalar curvature Kähler metrics, the relation between canonical metrics and stability conditions.

EDUCATION

2018-2022 **Imperial College London**

London School of Geometry and Number Theory

PhD in Pure Mathematics (ongoing)

Supervisors: Sir Simon Donaldson and Dr. Ruadhaí Dervan

2017-2018 **The University of Adelaide**

M.Phil. in Pure Mathematics

Thesis: *Hitchin's Projectively Flat Connection and the Moduli Space of Higgs Bundles*

Supervisors: Prof. Mathai Varghese and Dr. David Baraglia

2014-2016 **The University of Adelaide**

B.M.CS. in Pure Mathematics (GPA: 6.83/7)

AWARDS AND SCHOLARSHIPS

2018-2022 EPSRC CDT PhD Studentship, London School of Geometry and Number Theory

2018 2018 University Master by Research Medal, University of Adelaide

2018 Wazir Hasan and Amir Hasan Abdi Prize, University of Adelaide

2017-2018 Master of Philosophy Studentship, University of Adelaide

2016 J. R. Wilton Prize in the Mathematical Sciences, University of Adelaide

2016 David Murray Prize in the Mathematical Sciences, University of Adelaide

2016 E. S. Barnes Prize in Pure Mathematics, University of Adelaide

2015,2016 Executive Dean's Recognition of Academic Excellent, University of Adelaide

2016 Summer Vacation Scholarship, Australian Mathematical Sciences Institute

2015 J. H. Michael Prize in Pure Mathematics, University of Adelaide

PUBLICATIONS AND PREPRINTS

2021 Dervan, R., McCarthy, J.B. and Sektnan, L.M., 2020. Z -critical connections and Bridgeland stability conditions. arXiv preprint (70 pages) [arXiv:2012.10426](https://arxiv.org/abs/2012.10426).

2022 McCarthy, J.B., 2022. Canonical metrics on holomorphic fibre bundles. arXiv preprint (15 pages) [arXiv:2202.11630](https://arxiv.org/abs/2202.11630).

SERVICES

2020-Present Active contributor to [WikiProject Mathematics](#). Created or significantly expanded 25+ articles in pure mathematics and geometry.

2020-2021 Organiser of Imperial Junior Geometry Seminar

2021 Referee for Notices of the AMS.

INVITED TALKS

2021 Explicit K-stability and moduli problems, EDGE 2021, University of Edinburgh

2021 Institute for geometry and its applications 25th anniversary symposium, University of Adelaide

2021 K-stability and Kähler Geometry, University of Cambridge

2021 Working geometry seminar, University of Oxford

2018 Differential geometry research seminar, University of Adelaide

JUNIOR TALKS

2022 Junior geometry seminar, Imperial College London

2021 Oxford-London Gauge Assembly (Poster talk), University of Oxford

2021 Junior geometry seminar, Imperial College London

2020 Junior geometry seminar, Imperial College London

2019 Junior geometry seminar, Imperial College London

2018 Index Theory and Positive Scalar Curvature IGA Workshop (student talk), University of Adelaide

2017 Basic notions seminar, University of Adelaide

TEACHING

2017 Tutorial Instructor in Complex Analysis III and Mathematics IB, University of Adelaide

2021 Tutorial Instructor in Groups & Rings II, Imperial College London

REFERENCES

Simon Donaldson (PhD supervisor)
Imperial College London, Simons Center for Geometry and Physics
s.donaldson@imperial.ac.uk

Ruadháí Dervan (PhD supervisor)
University of Cambridge
rd430@cam.ac.uk

Richard Thomas
Imperial College London
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Frances Kirwan
University of Oxford
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