

## Active Grants

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- Simons Collaboration on Black Holes and Strong Gravity, shared between 12 international Co-PIs led by Nico Yunes at Urbana-Champaign, from September 2025-August 2029. Total for all Co-PIs USD 8m, my share USD 498,503.
- STFC Ernest Rutherford Fellowship, Solving Cosmological Questions in Strong Gravity, ST/V003240/1, October 2021-October 2026. Personal fellowship GBP 584,718.
- UKRI - Building a UK Numerical Relativity Community grant (January 2025 - December 2026) Co-I with Eugene Lim (PI), Mark Hannam, Patricia Schmidt and Geraint Pratten. Total for all Co-Is GBP 138,304.
- STFC - Astronomy Research at Queen Mary 2023 - 2026 - as Co-I on a funded project, ST/X000931/1, Total for all projects GBP 1,625,769.
- Leverhulme Trust Research Grant, as Co-Applicant with Principle Applicant Prof Eugene Lim, Can Cosmic Inflation make the Universe go Bang? Total project funds GBP 267,299.
- DiRAC Research Software Engineer (RSE) grant, joint with Miguel Bezares, Nottingham, for development of GRTelcyn and MHDuet NR codes, May 2025-May 2026. 2 x 50% Full Time Equivalent (FTE) DiRAC RSEs.
- PI for DiRAC High Performance Computing Grant 2023-2026, 50M CPUh on Cosma8 system in Durham, UK.
- PI for EuroHPC grant on LUMI-C system in Finland for 119 000 node hours.

## Previous Grants

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- Leverhulme Trust Research Grant, as Co-Applicant, with Principle Applicant Prof Jean Alexandre, Saving the Universe with finite volume effects in Quantum Field Theory. Total project funds GBP 111,208.
- DiRAC Research Software Engineer (RSE) grant, joint with Miguel Bezares, Nottingham, for development of GRTelcyn and MHDuet NR codes, May 2024-May 2025. 2 x 50% Full Time Equivalent (FTE) DiRAC RSEs.
- DiRAC Research Software Engineer (RSE) grant, for development of GRTelcyn NR code, May 2024-May 2025. 1 x 50% Full Time Equivalent (FTE) DiRAC RSE.
- PI of four independent projects on national DiRAC resources for over 60M CPU hours
- Co-PI on a series of Tier-0 European PRACE grants for over 75M CPU hours

## Awards

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- Institute of Physics James Clerk Maxwell Medal and Prize - for exceptional early-career contributions to theoretical physics, 2022
- PGCert Portfolio Prize - PGCert Teaching and Learning in Higher Education, University of Oxford, 2021
- Springer Thesis Prize - PhD thesis selected for publication by Springer, 2017
- Claude Curling Prize - best teaching assistant in physics, King's College London, 2015
- Edgell Sheppee Prize - for excellent performance in Finals, University of Oxford, 2006
- College Scholar, for distinction in Prelims, St Edmund Hall, University of Oxford, 2002

## Career to date

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- Ernest Rutherford Fellow and Senior Lecturer, School of Mathematical Sciences, Queen Mary University of London, UK, October 2021 - present
- Postdoctoral Research Assistant in Theoretical Cosmology And Gravitational Physics, University of Oxford, UK, October 2018 - October 2021
- Postdoctoral Research Assistant in Astrophysics, Georg-August University, Göttingen, Germany, January 2017 - October 2018
- PhD, Dept Theoretical Particle Physics and Cosmology, King's College London, London, UK, October 2013 - January 2017
- Bachelor of Science, Physics (BSc (Hons) Open, 1st Class), Open University, Distance learning degree, January 2011 - October 2013 (part time)
- Master of Engineering, Engineering Science (MEng, 1st Class), Oxford University, Specialism in Control and Information Engineering, and Mathematical Methods, 2002-2006
- During the period between my Masters degree and PhD I worked in finance in London, at Ernst & Young LLP as a Tax Assistant (2006-2009) and Ingenious Media Ltd as a Technical Manager (2009-2012)

## Scientific leadership roles

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- Advisory Board Member for the Center of Gravity, a Danish National Research Foundation Center of Excellence, from September 2025
- Rubin Observatory's Legacy Survey of Space and Time (LSST) UK Oversight Committee Member, from January 2025
- EuCAPT Steering Committee Member, The European Consortium for Astroparticle Theory, from 2024, ordinary committee member since 2022, contributor to EuCAPT white paper
- Institute of Physics Awards Committee Member, from 2023
- Astronomy and Cosmology Chair and panel member, STFC DiRAC Resource Allocation Committee for UK National HPC body, Chair from 2024 - present, Deputy chair April 2023 - April 2024, panel member since September 2020
- Associate member of the LISA consortium - Lead editor for the Dark Matter and Primordial Black Hole section of the Fundamental Physics working group white paper, contributor to Waveform working group white paper and Cosmology working group white paper.
- Lead developer in the GRTL collaboration ([www.grtlcollaboration.org](http://www.grtlcollaboration.org)): Our main NR code *GRChombo* is one of only several publicly available high performance codes in strong gravity. It has been developed in collaboration with Intel, and was a benchmark code for the acquisition of the UK High Performance Computing system DiRAC-3. I am leading the development of its successor code, *GRTEclyn*, which is performance portable on GPUs and will be released later this year. I also developed the 1D python based *engrenage* code, for teaching NR and for use in masters projects.
- Guest editor of journal special edition on "bosonic stars" Classical and Quantum Gravity (CQG) 2021, with Miguel Zilhao.
- Referee for high impact journals: Physical Review Letters, Physical Review D, JCAP, CQG, Open Journal of Astrophysics, Physics Letters B, European Physical Journal C

## Scientific organisation

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Scientific Organizing Committee member for:

- New Frontiers in Numerical Relativity workshop, Mallorca July 2025
- Numerical Relativity session organiser, GR 24/Amaldi in Glasgow, July 2025
- Gregynog Numerical Relativity 2025: Towards the Next Generation, Wales, June 2025
- IFPU focus week Numerical Relativity and Fundamental Fields, April 2025
- PAX IX meeting King's College London, July 2024
- Gravitational Wave Initiative inaugural meeting, Queen Mary University of London, May 2024
- Britgrav at Queen Mary University of London, April 2024
- At the interface of asymptotics, conformal methods and analysis in general relativity, the Royal Society, May 2023
- Kings and Queens of Gravity workshop April 2023
- London Strong Gravity Network October, since 2019
- Geometry, Analysis and Gravitation seminar series, Queen Mary University of London October 2021 - 2023
- Cosmology seminar series, Oxford October 2018 - 2021
- Collabor8 conference for junior researchers 2017 - 2018

## Supervision experience

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Graduate student and postdoctoral research supervision

- Aron Kovacs - Postdoc Queen Mary University of London (QMUL) 1/10/24 - present
- Silvia Pla Garcia - King's College London 1/10/22-1/10/24  
(Currently a postdoc in Munich)
- Thomas Spieksma PhD Student, visiting student from Niels Bohr Institute for 4 months 2025  
(Accepted a postdoc in Oxford, UK)
- Areef Waeming – PhD student supervisor QMUL, 1/10/2023 - present
- Shunhui Yao – PhD student co-supervisor QMUL, 1/1/2023 - present
- Samuel Brady – PhD student supervisor QMUL, 1/10/2022 - present
- Llibert Areste Salo – PhD student co-supervisor QMUL, 1/10/2021 - 1/10/2024  
(Currently a postdoc in Leuven)
- James Marsden – PhD student supervisor Oxford, 1/10/2021 - 1/7/2025  
(Accepted a postdoc in Hangzhou, China)
- James Bamber – PhD student supervisor Oxford, 1/10/2020 - 1/10/2023  
(Currently a postdoc in University of Illinois at Urbana-Champaign)
- Dina Traykova – PhD student co-supervisor Oxford, 1/10/2020 - 1/10/2021  
(Currently a postdoc in AEI Potsdam)
- Hanxi Wang - MMathPhys project supervisor Oxford, 1/10/2020 - 1/7/2021  
(Currently a PhD student in Oxford)
- Sladjana Radinovic – Masters project supervision Göttingen, 1/10/2017-1/3/2018  
(Went on to a PhD in Oslo)

## Graduate student examination

- Thomas Spieksma - Niels Bohr Institute Copenhagen, Denmark, September 2025
- Tongtong Hu - Queen Mary University of London, UK, June 2025
- Giovanni Tomaselli (external referee), GRAPPA, the Netherlands, October 2024
- Anson Chen - Queen Mary University of London, UK, September 2024
- Tamara Evstafyeva - Cambridge, UK, September 2024
- Daniela Cors - University of Jena, Germany, September 2023
- Fabrizio di Giovanni - University of Valencia, Spain, October 2022
- Cristian Joana - UC Louvain, Belgium, September 2022
- Rodrigo Vicente - CENTRA Lisbon, Portugal, September 2021
- Hayley MacPherson - Monash University Australia, July 2019

## Teaching experience

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### Qualifications

- Fellow of the UK Higher Education Academy - August 2024 - a qualification to professionally recognise individuals whose higher education teaching and support for learning practice enables them to evidence the requirements of Professional Standards Framework 2023 Descriptor 2.
- Post Graduate Certificate in Teaching and Learning in Higher Education from Oxford University, December 2020. Passed with Distinction and awarded the PGCert Portfolio Prize for the highest scoring portfolio of work.

### Courses taught and developed

- Numerical methods for scientific computing - Queen Mary University of London. Teaching for the Masters in Data Science, since 2022 - lectures, problem classes, setting and marking exams, course development
- Numerical Relativity - London Taught Course Centre, February 2025 - series of 5 hands-on lectures/problem classes for PhD students, setting and marking exams, course development
- General Relativity - University of Oxford 2018-21 - undergraduate tutorials for Physics
- Numerical Relativity - University of Oxford 2018-21 - lectures for undergraduate summer project students
- Mathematical Methods - University of Oxford 2018-2019 - undergraduate tutorials for Engineers
- General Relativity - Göttingen University 2017-18 - lectures, problem classes, setting and marking exams
- Visualisation of astrophysical simulations lab, Göttingen University 2017-18, lab development, supervision and marking
- Statistical Mechanics - King's College London 2013-16, undergraduate problem classes
- Group Theory - King's College London 2013-16, undergraduate problem classes
- Nuclear Physics - King's College London 2013-16, undergraduate problem classes

## Seminars and Colloquia

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Invited talks and lectures:

- New Frontiers in NR, Mallorca, panel chair, July 2025
- Axions in Stockholm, Nordita, plenary speaker, June 2025
- Durham HPC Days 2025, plenary speaker, June 2025
- IFPU focus week Gravitational Wave Probes of Black Hole Environments, May 2025
- UCL Cosmology Colloquium, London, UK, March 2024
- City University Maths Colloquium, London, UK, March 2024
- University of Sussex Colloquium, UK, March 2024
- Gravity2025, YITP, Kyoto, Japan, January 2024
- Imperial Theory Colloquium, London, UK, January 2024
- Annual Theory Meeting, Durham, UK, plenary speaker, December 2024
- Liverpool John Moores University, astrophysics seminar, November 2024
- Ondes gravitationnelles et objets compacts, Meudon, France, October 2024
- Fundamental Physics Meets Waveforms With LISA, AEI Potsdam, September 2024
- PAX IX King's College London, EDI session and panel discussions, July 2024
- New Horizons for Psi, Lisbon Portugal, lecturer on NR, July 2024
- Athexis: Athens Symposium on Exploring the Universe, June 2024
- Einstein Toolkit meeting USA, June 2024
- Gravity: Challenges Beyond General Relativity, Barcelona, Spain, May 2024
- AEI Potsdam gravity seminar, April 2024
- Edinburgh Parallel Computing Centre, plenary speaker and panel member, March 2024
- Royal Holloway particle physics seminar (UK), March 2024
- Cardiff Gravity seminar (UK), February 2024
- JENAS Initiative "Gravitational Wave Probes of Fundamental Physics" workshop, Rome (Italy), plenary speaker, February 2024
- Multifield Cosmology workshop, Simons Centre Stony Brook (US), February 2024
- Kavli Gravitational Wave school, Corfu (Greece), invited lecturer, June 23
- Einstein Toolkit workshop, Aveiro (Portugal), invited speaker, June 23
- Peyresque workshop, (France) June 23
- Dark matter conference, Santander (Spain), plenary speaker, May 23
- Cambridge University (UK), GR seminar, May 2023
- Dark matter and stars conference, Lisbon (Portugal), plenary speaker, May 23
- American Physical Society April meeting (Minneapolis, USA), plenary speaker, April 23
- Niels Bohr Institute, Copenhagen (Denmark) GR seminar, March 23
- Tuebingen University (Germany) Cosmology colloquium, February 23
- Higgs Colloquium (Edinburgh, UK) January 23

- LISA Fundamental Physics workshop (Brussels), plenary speaker May 2022
- Max Planck Institute (AEI) Potsdam (Germany), GR seminar, March 2022
- Nottingham University (UK), Particle cosmology seminar, March 2022
- IoP Gravitational Physics Group Beyond General Relativity Meeting, December 2021
- University College London (UK), Astrophysics seminar, November 2021
- London Strong Gravity Meeting (UK), November 2021
- Perimeter Institute (Canada) Strong gravity seminar, October 2021
- EUCAPT meeting (CERN) plenary speaker May 2021
- Current Challenges in Gravitational Physics (SISSA) (Italy) April 2021
- Le Laboratoire Univers et Théories (LUTH) (France) Cosmology seminar, February 2021
- Cambridge University (UK), GR seminar, January 2021
- ICG Portsmouth (UK), Cosmology seminar, December 2020
- Washington University in St Louis (USA), Cosmology seminar, November 2020
- Sheffield University (UK), Cosmology seminar, October 2020
- Physics of the Early Universe, ICTS Bengaluru (India), September 2020
- Queen Mary University London (UK), Relativity and cosmology seminar, April 2020
- Max Planck Institute (AEI) Hannover (Germany), Group colloquium, January 2020
- Max Planck Institute (AEI) Potsdam (Germany), GR seminar, November 2019
- Columbia University (USA) Theory seminar, October 2019
- Johns Hopkins University (USA) Astrophysics seminar, October 2019
- King's College London (UK), TPPC group seminar, March 2019
- LISA Waveform Working Group Meeting, AEI (Germany), plenary speaker, May 2019
- King's College London (UK), TPPC group seminar, March 2019
- Cambridge University (UK), GR seminar, March 2019
- Birmingham University (UK), astrophysics seminar, February 2019
- ICTP Trieste (Italy), Theory seminar, December 2018
- ICG Portsmouth (UK), Physics Colloquium, November 2018
- CENTRA, Lisbon (Portugal), Gravity seminar, November 2018
- Nottingham University (UK), Particle cosmology seminar, October 2018
- Forefronts in Cosmology and Numerical General Relativity, Salzburg (Austria), July 2018
- Numerical Relativity beyond GR Workshop, Benasque (Spain), June 2018
- Bologna University (Italy), Theoretical Physics group seminar, May 2018
- Max Planck Institute (AEI) Hannover (Germany), group seminar, February 2018
- Oxford University (UK), Theory and Astrophysics group seminars, June, October 2017
- Open Questions in Particle Physics, Göttingen University (Germany), May 2017
- Perimeter Institute (Canada), Cosmology and Strong Gravity groups, December 2016
- Cardiff University (UK), Numerical Relativity group seminar, November 2016
- Astrophysics seminar, University of Goettingen (Germany), September 2016
- Workshop on Numerical Relativity, University of Jena (Germany), September 2016

## Outreach activities

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- Invited plenary speaker, New Scientist Live Event, London Excel Centre, October 2025
- BBC Radio 4, Curious Cases Series 23, Episode 11, June 2025
- New Scientist Instant Expert Event: Cosmology at the Cutting Edge, March 2025
- BBC Radio 4, In Our Time, Wormholes, September 2024
- The Birth of an Idea - contributed essay for collection collated by artist Ana Sousa Carvalho and physicist Vitor Cardoso, 2024
- Article for The Conversation - How gravitational waves could help detect Star Trek-style warp drive space-ships. In 2024 our article on warp drive gravitational wave signals also attracted coverage across the media, including the Daily Mail in the UK, Bild in Germany, and various online outlets like Popular Mechanics. We were also the subject of a full episode of PBS Space Time that has over 500k views on YouTube.
- Royal Institution lecture The Limits of Astrophysics, March 2023, the recording has over 250k views on YouTube
- BBC Radio 4, The Curious Cases of Rutherford and Fry, Series 17, Parts 1 and 2 of A Weighty Matter, February 2021
- Since joining Queen Mary University of London in 2021 I have regularly taken part in our outreach activities, including the annual Girls in Maths and QM Futures taster lectures for school children from local East London communities, who are from historically underrepresented groups in mathematics and physics.
- IoP Oxford Public Lecture "Gravity's role in the story of our Universe" September 2020
- Organiser and presenter of workshop "Using computers to Simulate the Universe" for secondary school girls, Oxford University UK, May 2019
- Invited speaker, Women in Physics Group, Lancaster University (UK), May 2018
- Speaker, Pint of Science London, May 2016. My talk "Am I Crazy, or is it Physics?" was later published online on KnowItWall.com, and republished on pionic.org.
- Speaker, Soapbox Science Women in Science event, London, May 2016
- Tutor, the Access Project - tutoring in physics/mathematics for disadvantaged school students, 2014-2016
- Speaker, Ada Lovelace Day Women in Physics poster presentation, King's College London, 2015 and 2016
- Public guide, Monopole Quest, Royal Society Summer Exhibition London, June 2015