



Graham Van Goffrier

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A passionate PhD student physicist with broad experience across particle theory, nonlinear optimisation, mathematics, and computation. Contributed to research efforts in collaborations on interdepartmental and international scales. A dedicated leader focused on energizing professional development and community outreach.

Skills:

- ◆ Applied Mathematics
- ◆ Physical Intuition and Reasoning
- ◆ Data Analysis and Interpretation
- ◆ Scientific Computing
- ◆ Team Leadership and Project Management
- ◆ Scientific Communication, Written and Spoken
- ◆ Global Collaboration
- ◆ Electronics Design and Testing
- ◆ Language Acquisition
- ◆ Independent Learning
- ◆ Teaching and Tutoring

Research and Work Experience:

2020: UK Atomic Energy Authority, Culham Centre for Fusion Energy: Part-time research placement on the application of machine learning and surrogate models to optimize the design of tritium-breeding fusion reactors, with Petr Manek, Vignesh Gopakumar, Dr. Jonathan Shimwell, Dr. Nikolaos Nikolaou, and Prof. Ingo Waldmann.

2019-2020: University of Cambridge, Department of Engineering: Research focusing on matrix manifold geometry, nonlinear optimisation, and consensus algorithms, with Cyrus Mostajeran and Prof. Rodolphe Sepulchre.

2017: CERN, ATLAS-ttH Summer Student: Research project on the use of FOAMs (iteratively discretized probability distributions) for Monte-Carlo event generation, with Prof. Tancredi Carli and Dr. Alexander Held, supported by UM-CERN-REU and NSF.

2016-18: University of Maine, Department of Physics: Student research investigating visualisation of relativistic open- and closed-string solutions, including study of string cusps and kinks, with Prof. Neil Comins.

2016: University of Maine, Departments of Computer Science and Physics: Summer research projects on context-based reasoning systems, with Prof. Roy Turner, and on simulation of confocal optics for super-resolution microscopy, with Prof. Sam Hess.

2015: University of Maine, Laboratory for Surface Science and Technology: Research assistant employing MATLAB to model the frequency responses of Surface Acoustic Wave (SAW) devices, with Prof. Mauricio da Cunha.

2014-18: University of Maine, Departments of Physics and Elec/Comp Engineering: Teaching assistant for six semesters of courses ranging across theory, application, computation, and technical writing. Hosting workshops, administering lab sections, conducting mock interviews, grading lab reports, guiding students during and outside of class, and exam preparation.

Education:

University College London, PhD Candidate in Particle Physics (Data-Intensive Science)

University of Cambridge, MAST Applied Mathematics, 2019

University of Maine, Orono, M.S. Electrical Engineering (GPA 4.00/4.00), 2018

University of Maine, Orono, B.S. Physics (GPA 4.00/4.00), 2018

- ◆ Class of 2018 Valedictorian, *summa cum laude*, Phi Beta Kappa
- ◆ Minors: Mathematics, Electrical Engineering, Nanotechnology

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Publications:

- ◆ Deppisch, Frank F. and Graham Van Goffrier. "Least-Informative Priors for $0\nu\beta\beta$ Decay Searches." *Submitted to Physical Review D. arXiv*, 2021, <https://arxiv.org/abs/2103.06660>. Preprint.
- ◆ Mánek, Petr et al. "Fast Regression of the Tritium Breeding Ratio in Fusion Reactors." *Submitted to Nuclear Fusion. arXiv*, 2021, <https://arxiv.org/abs/2104.04026>. Preprint.
- ◆ Mostajeran, Cyrus et al. "Target formation on the circle by monotone system design." *Accepted for 2021 IEEE Conference on Decision and Control. arXiv*, 2021, <https://arxiv.org/abs/2103.13913>. Preprint.
- ◆ Van Goffrier, Graham et al. "Inductive Geometric Matrix Midranges." *Accepted for 24th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2020). arXiv*, 2020, <https://arxiv.org/abs/2006.01508>. Preprint.

Awards:

- ◆ NSF Graduate Research Fellow, 2019 (declined due to overseas student status)
- ◆ Valedictorian, University of Maine, 2018
- ◆ Goldwater Scholar, 2017
- ◆ UMaine Dean's List and President's Scholarship, all semesters
- ◆ UMaine Departmental Scholarships (Physics, Engineering, and Alumni) 2014-18
- ◆ Putnam Mathematical Competition, UMaine High Scorer, 2015-16
- ◆ National Merit Scholar, 2014

Leadership Positions and Community Service:

- ◆ University College London, PGR Student Representative to the Faculty of Mathematics and Physical Sciences, and elected to UCL Research Degrees Committee (2019-21)
- ◆ University of Cambridge, Graduate Student Representative to the Council of the School of Physical Sciences (2019)
- ◆ SPS and TBP, Maine Day Campus Clean-up Activities (2015-18)
- ◆ SPS, UMaine Chapter (2014-18), served as President
- ◆ IEEE, UMaine Student Branch (2014-18), served as President
- ◆ UMaine Engineering Job Fair/Engineering Expo Volunteer (2014-18)
- ◆ IEEE-HKN UMaine Chapter (2016-18), served as Vice President
- ◆ Tau Beta Pi Maine Alpha Chapter (2016-18), served as President

Affiliations:

- ◆ AMS (American Mathematical Society)
- ◆ ANS (American Nuclear Society)
- ◆ APS (American Physical Society)
- ◆ EPS (European Physical Society)
- ◆ Golden Key International Honour Society
- ◆ IEEE Eta Kappa Nu Honour Society
- ◆ IOP (Institute of Physics)
- ◆ LMS (London Mathematical Society)
- ◆ PBK (Phi Beta Kappa)
- ◆ PKP (Phi Kappa Phi)
- ◆ Sigma Pi Sigma Physics Honour Society
- ◆ Sigma Xi, The Scientific Research Honour Society
- ◆ TBP (Tau Beta Pi, Pan-Engineering Honour Society)
- ◆ The Nuclear Institute

References:

- ◆ Professor Frank Deppisch, Professor of Physics, University College London (f.deppisch@ucl.ac.uk)
- ◆ Dr. Cyrus Mostajeran, Junior Research Fellow, Control Group, University of Cambridge (csm54@eng.cam.ac.uk)
- ◆ Professor Neil Comins, Professor of Physics and Astronomy, University of Maine (galaxy@maine.edu)
- ◆ Professor Donald Hummels, Chair of Electrical/Computer Engineering, University of Maine (hummels@umit.maine.edu)

