James N Graham

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Education

University of Oxford, Oxford, UK
    DPhil Theoretical Physics   2020—present
    MSc Mathematical & Theoretical Physics, *Distinction*   2017
Northwestern University, Evanston, IL
    BS Applied Mathematics, *summa cum laude*   2016

Teaching

Teaching Assistant, Mathematical Institute, University of Oxford   Jan.—Apr. 2021
- Marked four General Relativity problem sheets for a total of eleven students split into two classes;
- Presented at least one problem per class remotely with Microsoft Teams;
- Assisted class tutor in answering students' physical and mathematical questions during classes.

Mathematics Tutor, Washington, DC   2019—present
- Tutored a pair of brothers on topics from arithmetic with fractions and decimals up to IB Analysis.

Teaching Assistant, Department of Mathematics, Northwestern University   Sept. 2015—Mar. 2016
- Led a discussion section on calculus for one hour per week;
- Answered students' questions about questions from problem sets, including occasionally typesetting and distributing solutions;
- Invigilated and marked two department-wide quizzes and exams each term.

Employment

Collections Invigilator, Pembroke College, University of Oxford   2022—present
- Facilitated the sitting of mock exams for as many as 60 students at a time;
- Informed the Academic Office of issues including missing exams and students.

Physics Aptitude Test Marker, Department of Physics, University of Oxford   Nov. 2021
- Developed a mark scheme for a small number of free-response problems;
- Worked with other markers to ensure the mark scheme was applied consistently.

Education Coordinator, Mathnasium of Tysons, Vienna, VA   Oct. 2019—Jul. 2020
- Maintained individualized curricula for more than 150 students to respond to long-term learning needs and short-term school requirements;
- Supervised more than 15 instructors to ensure consistent, responsive and personalized instruction;
- Managed relationships with parents to set expectations, report students' progress and achieve learning goals;
- Provided technical support and advice to help families transition from in-person to online learning.

Research Assistant, Applied Mathematics, Northwestern University   Mar. 2014—Jan. 2015
- Modeled the activity and synchronization of a network of neurons using Python;
- Developed tools to visualize simulation data using MATLAB and Mathematica;
- Invesigated synchronization of neural firing in presence of periodic stimulus.

Research Assistant, Applied Mathematics, Northwestern University   Apr.—Sept. 2013
- Implemented a neural network to simulate an in-vivo cortex using MATLAB;
- Investigated synapse survival through stimulation by memories.

Publications

Adams W, **Graham JN**, Han X, Riecke H (2019) Top-down inputs drive neuronal network rewiring and context-enhanced sensory processing in olfaction. PLoS Comput Biol 15(1): e1006611. https://doi.org/10.1371/journal.pcbi.1006611

Karamchandani, A. J., **Graham, J. N.**, & Riecke, H. E. (2018). Pulse-coupled mixed-mode oscillators: Cluster states and extreme noise sensitivity. *Chaos*, *28*(4), [043115]. https://doi.org/10.1063/1.5021180

Posters — Conferences — Schools — Seminars

EMBO Workshop on Physics of cells: PhysCell2022	Sept. 2022
International School on Biological Physics of Cells	Sept. 2022
XXVIII International Summer School Instituto Nicolás Cabrera	Sept. 2022
3CR Talk Series	May 2022
Pembroke Physics Society	May 2017

Awards

Senior Studentship at Pembroke College, Oxford	2023
Outstanding Graduate Prize in Applied Mathematics	2016
Roger Boye Oxbridge Bursary to support study at Oxford	2016
Summer Research Opportunities Award	2014
Merck Index Award for outstanding performance in organic chemistry	2013

Skills

C++ • Python • LaTeX • Mathematica • Git • MATLAB • HTML • CSS
Research • Communication • Teaching