# James 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

## Research & Coursework

**Non-Perturbative Methods in Quantum Field Theory**, University of Oxford — Mar.—Apr. 2017
- o Implemented a statistical algorithm to simulate a quantum theory using C++;
- o Extracted physical quantities from correlation functions with MATLAB and Excel.

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

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

## Employment

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

**Instructor, Mathnasium of Mount Vernon, Alexandria, VA** — Apr. 2019—Oct. 2019
- o **Taught students mathematical topics ranging from basic facts to trigonometry and pre-calculus in a small group setting;**
- o **Managed individualized workflows of several students simultaneously;**
- o **Enthused students in mathematics by relating my experiences to theirs.**

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

## Publications

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

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

## Awards

**Outstanding Graduate Prize in Applied Mathematics** — 2016
**Roger Boye Oxbridge Bursary** to support study at Oxford — 2016
**Summer Research Opportunities Award** to support summer research — 2014
**Merck Index Award** for outstanding performance in organic chemistry — 2013

## Skills

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