

Ali Ramadhan

COMPUTATIONAL PHYSICIST · EXPERIMENTAL AMO · PASSIONATE TEACHER

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Education

University of Waterloo

Waterloo, ON

MASTER OF SCIENCE: PHYSICS (EXPECTED AUG 2017)

2016-Present

Supervisor: Joseph Sanderson (Thesis: Creating molecular motion movies using Coulomb explosion imaging and Bayesian inference)

University of Waterloo

Waterloo, ON

BACHELOR OF SCIENCE: HONOURS CO-OPERATIVE PHYSICS WITH JOINT HONOURS MATHEMATICS

2016

Graduating Dean's Honours List (Senior thesis: Dissociation dynamics of the OCS molecule induced by soft X-ray synchrotron radiation)

Research Experience

University of Waterloo

Waterloo, ON

RESEARCH ASSISTANT, DEPARTMENT OF PHYSICS AND ASTRONOMY

Aug 2013 - Present

- Developing a rigorous computational framework for creating molecular movies using Coulomb explosion imaging for my thesis.
- Studied ultrafast molecular dynamics at the Canadian Light Source synchrotron during four visits, two of them alone.
- Collaborated with engineering groups to produce defect-free graphene oxide gels for use in graphene devices, and on welding microwires.

Tokyo Metropolitan University

Tokyo, Japan

RESEARCH ASSISTANT, DEPARTMENT OF CHEMISTRY

Sep - Dec 2014

- Produced polyynes and controlled their end-caps using ultrashort laser pulses and performed the analytical chemical analyses.
- Characterized polyynes at Kindai University and also gave a talk at a chemistry seminar on my research.
- Took language courses and self-studied Japanese, improving my communication and teamwork skills with my colleagues.

Ontario Institute for Cancer Research

Toronto, ON

BIOINFORMATICS SPECIALIST, INFORMATICS AND BIO-COMPUTING PROGRAM

Jan - Apr 2013

- Processed and published a wide variety of genomic data sets to multiple databases where they are publicly available for use by the scientific community in cancer research.
- Automated the vast majority of the data processing, publishing my data sets two weeks ahead of deadline.

Teaching Experience

TA EXPERIENCE

- 2016 **Graduate Teaching Assistant**, Thermal Physics, University of Waterloo
- 2016 **Drop-in Tutor (4x)**, Calculus II, University of Waterloo
- 2015 **Undergraduate Teaching Assistant**, Electricity & Magnetism I, University of Waterloo
- 2015 **Undergraduate Teaching Assistant**, Discrete Mathematics, University of Waterloo
- 2015 **Drop-in Tutor (2x)**, Electricity & Magnetism I, University of Waterloo
- 2014 **Drop-in Tutor**, Linear Algebra I, University of Waterloo
- 2014 **Undergraduate Teaching Assistant (2x)**, Physics I: Mechanics, University of Waterloo
- 2014 **Undergraduate Teaching Assistant (2x)**, Calculus II, University of Waterloo
- 2013 **Undergraduate Teaching Assistant**, Linear Algebra I, University of Waterloo

OTHER EXPERIENCE

- 2016- **Founder**, Project Lovelace (an open online platform for learning science through programming and problem solving.)
- 2015- **Organizational Team Member and Tutor**, Frontier College (Canadian literacy organization)
- 2012- **Private Tutor**, Independent and through AccessAbility Services, University of Waterloo

Recent Activities

Project Lovelace

FOUNDER

Sep 2016 - Present

- Developing an open online platform for learning science and computational methods through programming and problem solving.
- Writing up problems and tutorials with help and ideas from others. Also applying for an eCampusOntario innovation grant.

Frontier College

Waterloo, ON

ORGANIZATIONAL TEAM MEMBER AND TUTOR

Jan 2015 - Present

- Working with local schools to develop new educational programs for underprivileged high-school students.
- Tutored middle-school and high-school students one-on-one with math, science, and English for two nights a week.

UW Cooking Club

University of Waterloo

FOUNDER, PRESIDENT (5X), VICE-PRESIDENT EXTERNAL (3X)

Sep 2012 - Sep 2016

- Founded a club for students who enjoy cooking to meet and to teach other students how to cook.
- Led a team of 12-25 executive members as president to plan events, recruit members, advertise events, and ensure smooth club operation.
- Planned and hosted cooking classes, competitions, potlucks, bake sales, BBQ's, restaurant outings, and field trips. Many events were highly attended (50-100) and members consistently rated our classes highly.

Publications

WORKING PAPERS

- 2016 **Easy end-cap control in the synthesis of long-chain polyynes by intense ultrashort laser pulse irradiation**, A. Ramadhan, M. Wesolowski, T. Wakabayashi, H. Shiromaru, T. Fujino, T. Kodama, W. Duley, J. Sanderson, Submitted (2016).

REFEREED PAPERS

- 2016 **Ultrafast molecular dynamics of dissociative ionization in OCS probed by soft X-ray synchrotron radiation**, A. Ramadhan, B. Wales, I. Gauthier, R. Karimi, M. MacDonald, L. Zuin, J. Sanderson, Accepted for publication in *Journal of Physics B: Atomic, Molecular, and Optical Physics* (2016).
- 2016 **A Novel Femtosecond Laser-Assisted Method for the Synthesis of Reduced Graphene Oxide Gels and Thin Films with Tunable Properties**, K. Ibrahim, M. Irannejad, M. Hajialamdari, A. Ramadhan, K. Musselman, J. Sanderson, M. Yavuz, *Advanced Materials Interfaces* **3**, 1500864 (2016).
- 2014 **Ultrafast Light Interaction with Graphene Oxide Aqueous Solution**, K. Ibrahim, M. Irannejad, A. Ramadhan, W. Alayak, J. Sanderson, B. Cui, A. Brzezinski, M. Yavuz, *Proceedings of the 14th IEEE International Conference on Nanotechnology*, 830-831 (2014).
- 2014 **Welding of Au Microwires by Femtosecond Laser Irradiation**, N. Ly, M. Mayer, A. Ramadhan, and J. Sanderson, *Proceedings of the 14th IEEE International Conference on Nanotechnology*, 146-149 (2014).
- 2014 **Coulomb imaging of the concerted and stepwise break up processes of OCS ions in intense femtosecond laser radiation**, B. Wales, É. Bisson, R. Karimi, S. Beaulieu, A. Ramadhan, M. Giguère, Z. Long, W. Liu, J. Kieffer, F. Légaré, J. Sanderson, *Journal of Electron Spectroscopy and Related Phenomena* **195**, 332-336 (2014).

Talks

- 2016 **Comparing Coulomb explosion dynamics of multiply charged OCS after ionization by soft X-rays and few cycle femtosecond laser pulses**, Photonics North 2016, Québec City, QC, Canada.
- 2015 **Reconstructing Molecular Geometries of Small Molecules using Coulomb Explosion Imaging**, Compute Ontario Research Day, Kitchener, ON, Canada.
- 2014 **Coulomb Explosion Imaging and Polyyne Production in Toluene using Femtosecond Laser Pulses**, Kindai University Physical Chemistry Colloquium, Osaka, Japan.
- 2014 **Imaging of Structure in the OCS6+ molecule using intense variable pulse length 7-200fs laser pulses**, Photonics North 2014, Montréal, QC, Canada.
- 2014 **Coulomb Explosion Imaging of CO2 and OCS in Intense Femtosecond Laser Radiation**, Canadian Undergraduate Physics Conference, Hamilton, ON, Canada.

Awards

- 2016 **Alexander Graham Bell Canada Graduate Scholarship**, NSERC
- 2016 **President's Graduate Scholarship**, University of Waterloo
- 2016 **Marie Curie Award**, University of Waterloo
- 2016 **Dean's Honours List (7x)**, University of Waterloo
- 2015 **Undergraduate Research Award**, NSERC
- 2015 **Xerox Research Centre of Canada Limited Work-Term Report Award**, University of Waterloo
- 2013 **Undergraduate Research Award**, Natural Sciences and Engineering Research Council of Canada (NSERC)