curriculum vitae

Sepehr Fathi

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EDUCATION

2015–2017 MSc in Physics and Astronomy
York University, Toronto, Ontario
Thesis topic: Investigating Aircraft-based Emissions Estimates Using GEM-MACH With The Top-down Emission Rate Retrieval Algorithm (TERRA)
Supervisor: Professor Mark Gordon

2012–2015 Honours BSc in Specialist Physics
University Of Toronto, Toronto, Ontario
Research topic: Absolute Ligand Discrimination by Dimeric Signaling Receptors
Supervisor: Professor Anton Zilman

RESEARCH EXPERIENCE

2015–present **Research Assistant,** Air Quality Research Lab, Earth and Space Science and Engineering Department, **York University**, Toronto, Ontario
Supervisor: Professor Mark Gordon
Working in collaboration with the Air Quality department of Environment Canada. Studies at Environment Canada included an airborne measurement campaign over the Alberta Oil Sands. The Top-down Emission Rate Retrieval Algorithm (TERRA) was developed by Environment and Climate Change Canada to estimate facility emission rates based on the aircraft measurements (Gordon et al, 2015). Working on improving TERRA by using Environment and Climate Change Canada's air quality model, Global Environmental Multiscale-Modeling Air-quality and CHemistry (GEM-MACH), as a surrogate source of concentration and meteorology data. The work evaluates the combination of TERRA and GEM-MACH as a proxy for testing the downward extrapolation schemes within TERRA and identifies possible avenues for GEM-MACH and/or TERRA improvements. Outcomes from this work can provide useful suggestions for future flight plans for top-down emission rate estimations.

2014–2016 **Research Assistant,** Department of Physics, **University Of Toronto**, Toronto, Ontario
Supervisor: Professor Anton Zilman
Worked on developing stochastic models of systems of IFN-Signaling pathways associated with human immune system, employing Gillespie stochastic method, to test and improve a theory proposing a discrimination mechanism in immune cells. Results were published in Biophysical Journal, September 2016, under the title "Absolute Ligand Discrimination by Dimeric Signaling Receptors".

TEACHING EXPERIENCE

2015–present **Lab Instructor**, **York University**, Toronto, Ontario

- PHYS 1010 6.0 Physics
- PHYS 1410 6.0 Introductory Physics for Biologists
- PHYS 1420 6.0 Physical Science
- PHYS 2211 1.0 Experimental Electromagnetism

Organized and instructed lab sessions, and graded lab reports.

2016–present **Teaching Assistant**, **York University**, Toronto, Ontario

- PHYS 1010 6.0 Physics

Graded term and final examinations.

LEADERSHIP EXPERIENCE

2008–2011 **Editor in chief**, **IAU-SRB, Physics Dept.**'s Astronomy magazine, Tehran, Iran
Coordinated with managing editor and determined content for each and every issue; Supervised editorial, art and production staff of 25, as well as freelancers; Cross-checked facts, spelling, grammar, writing style, designed pages and photos; took responsibility for resulting issues.

PUBLICATIONS, PEER REVIEWED

Sepehr Fathi, Mark Gordon, Paul Makar, Shao-Meng Li, Andrea L Darlington, Ayodeji Akingunola, Junhua Zhang, Michael D Moran, Qiong Zheng, "Investigating aircraft-based emissions estimates using GEM-MACH with the top-down emission rate retrieval algorithm (TERRA)", (in progress).

Sepehr Fathi, Chitra R. Nayak, Jordan J. Feld, Anton G. Zilman, "Absolute Ligand Discrimination by Dimeric Signaling Receptors", ***Biophysical Journal***, *Volume 111, Issue 5, Pages 917-920, (2016).* DOI: http://dx.doi.org/10.1016/j.bpj.2016.07.029

Conference Abstract and poster,

2016 **Sepehr Fathi**, "Investigating aircraft-based emissions estimates using GEM-MACH with the top-down emission rate retrieval algorithm (TERRA)", *49th* AGU *Fall Meeting*, San Francisco, CA, USA.

AGU's Outstanding Student Paper Awards (OSPA) Score: 39/45

- ***Judge's comment**: Really intriguing work. It's a very interesting approach. I look forward to seeing this study once it's published. Good use of your poster space. You have an excellent understanding of your subject. Make sure to clearly highlight the pollutants you are studying. Because of the sophistication of your approach, you should be prepared to give a simple overview of your approach before proceeding with the details. Great job!*

Invited Presentation

2016 **Sepehr Fathi**, "Absolute Ligand Discrimination by Dimeric Signaling Receptors", *Biophysics club November meeting, York University*, Toronto, Ontario, Canada

Memberships

2016–present **Member**, AGU - American Geophysical Union

2015–present **Member**, IACPES - Integrating Atmospheric Chemistry and Physics, from Earth to Space

Academic Award

2014 Natural Sciences and Engineering Research Council of Canada (NSERC-USRA)
$ 8,000

Computer Skills

Programming languages in the order of proficiency:
Python, Igor, MATLAB, C++, Fortran

Softwares: LaTex, BioNetGen, Blender, Photoshop

Languages

- **English:** Full Professional Proficiency
- **Persian:** Native
- **Azerbaijani:** Bilingual

REFERENCES

- Professor Mark Gordon, Department of Earth Space Science and Engineering, York University (thesis supervisor).
  Tel: (416) 736-2100 x 22764
  E-mail: mgordon@yorku.ca
- Professor Anton Zilman, Physics Department, University Of Toronto (undergraduate research supervisor).
  Tel: (416) 978-4946
  E-mail: zilmana@physics.utoronto.ca
- Professor Peter Taylor, Department of Earth Space Science and Engineering, York University.
  Tel: (416) 736-2100 x 77707
  E-mail: pat@yorku.ca