Curriculum Vitae

Contact

Naser Mahfouz
5000 Forbes Ave, Pittsburgh, PA 15213
(401) 368-3080, nmahfouz@andrew.cmu.edu

Education

Carnegie Mellon University — *Pittsburgh, PA*
PhD, chemical engineering — *Aug 2015 – Aug 2020*

Brown University — *Providence, RI*
ScB, bioengineering and biomedical engineering — *Sep 2011 – May 2015*

United World College of the Atlantic — *St Donats, UK*
Bilingual diploma, International Baccalaureate — *Sep 2009 – May 2011*

Outlook

Seeking a post-doctoral or research position in engineering or science; interests: forward and inverse modeling, balance laws, partial differential equations, (bio)transport phenomena, fluid dynamics, turbulence, computational methods, high-performance computing.

Coursework

PDE theory & numerics, optimization, control, instrumentation/biomedical design, fluid mechanics, statistical thermodynamics, (bio)transport, heat/mass transfer, physiology, cell biophysics, neuroengineering, electricity & magnetism, biomechanics, biomaterials, computational probability/statistics, kinetics, (bio)chemical reactor design, physical chemistry, meteorology

Research

College of Engineering, Carnegie Mellon University — *Pittsburgh, PA*
Graduate Researcher — *Aug 2015 – Aug 2020*

- Part of Center for Atmospheric Particle Studies with Professor Neil Donahue
- Built particle model based on 1D hyperbolic PDE theory to investigate chamber experiments
- Incorporated coagulation of charged particles to study validity/extent of ion-induced nucleation
- Modeled dynamics of atmospheric ion charging effects on aerosol particle deposition
- Constructed model reconciling instrumentation's biases based on mobility and aerodynamics
- Developed open-source CFD model to study turbulent deposition of particles on HPC
- Collaborated with CERN researchers to design experiments and test models for nucleation

School of Engineering, Brown University — *Providence, RI*
Undergraduate Researcher — *Sep 2013 – May 2015*

- Part of Laboratory for Environmental and Health Nanoscience with Professor Robert Hurt
- Designed experiments probing graphene oxide preferential water transport from solutions
- Conducted experiments studying graphene oxide films separating water-alcohol mixtures
- Characterized graphene oxide layers using refraction methods; modeled transport phenomena

Teaching

College of Engineering, Carnegie Mellon University — *Pittsburgh, PA*
Teaching Assistant — *Jan 2016 – May 2019*
- Held weekly office hours, delivered guest lectures
- Courses: kinetics, physical chemistry, atmospheric chemistry modeling, climate change chemistry and physics, meteorology

School of Engineering, Brown University — *Providence, RI*
Teaching Assistant — *Jun 2014 – May 2015*
- Held weekly office hours, led problem sessions
- Delivered laboratory lectures, supervised experiments
- Courses included: thermodynamics, biomechanics, robotics

Department of Mathematics, Brown University — *Providence, RI*
Teaching Assistant — *Jan 2013 – Dec 2013*
- Held a supplementary lecture, office hours weekly
- Evaluated students' performance, provided feedback
- Promoted to head TA: managed other TAs and graders
- Courses included: multivariable calculus for engineering, physics

Office of the Dean of College, Brown University — *Providence, RI*
Academic Tutor — *Nov 2012 – May 2015*
- Coached students in groups, individually
- Advised students on progress, study plans
- Trained newly-assigned mathematics tutors
- Areas included: mathematics, engineering, chemistry

The Brown Leadership Institute, Brown University — *Providence, RI*
Leader Fellow — *Jun 2013 – Aug 2013*
- Teaching assistant, residential advisor of high school students
- Facilitated leadership and diversity workshops, ropes courses
- Led class on the scientific revolutions and paradigm shifts

Other

Media Production Group, Brown University — *Providence, RI*
Production Assistant — *Mar 2012 – May 2015*
- Filmed live events in teams, individually
- Automated archiving, production, publishing
- Helped professors with instructional, educational technology

Atlantic Outdoor Centre, UWC Atlantic College — *St Donats, UK*
Summer Instructor — *May 2011 – Jul 2011*
- Mentored children with varying abilities
- Developed leadership skills, group cohesiveness
- Activities included: archery, canoeing, initiative exercises

Publications

Mahfouz, N. G. & Donahue, N. M. (2020). On the coagulation of small ions and ion-induced nucleation in the atmosphere. In preparation. *Geophysical Research Letters*.

Mahfouz, N. G., ... & Donahue, N. M. (2020). Aerosol particle deposition in turbulent chambers: revisited. In preparation. *Journal of Aerosol Science*.

Mahfouz, N. G. & Donahue, N. M. (2020). Primary ion diffusion charging and particle wall loss in smog chamber experiments. Accepted. *Aerosol Science and Technology*.

Spitz Steinberg, R., Cruz, M., Mahfouz, N. G., Qiu, Y., & Hurt, R. H. (2017). Breathable vapor toxicant barriers based on multilayer graphene oxide. *ACS nano, 11*(6), 5670-5679.

Presentations

"Modeling particles in chambers: a closer look at deposition."
2019 37th AAAR Conference in Portland, OR.

"Graphene oxide-based materials for environmental and selective barriers."
2014 AIChE Annual Meeting in Atlanta, GA.

Honors

2018–2019 Robert R. Rothus Graduate Fellowship
2016–2017 Roy W. Weiland Graduate Fellowship
2015–2016 Bradford and Diane Smith Graduate Fellowship
2014 AIChE Outstanding Poster Award (Separation)
2011–2015 Brown Club of London Scholarship
2011–2015 Davis United World College Scholar
2011 Featured Admission Essay at Brown University
2009–2011 UWC Atlantic College Scholarship