

Amel Derras-Chouk

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Current Position

City College of New York
Postdoctoral Researcher
New York, NY
Sept. 2022 - Present

- Integrate remote sensing and physical models to study cumulus convection, better quantifying uncertain variables like vertical velocity and mass flux

Education

The Graduate Center, City University of New York
PhD, Physics
New York, NY
Sept. 2022

Dissertation: *Stability of two-dimensional magnetic skyrmions*
Advisors: Prof. Eugene M. Chudnovsky and Prof. Dmitry A. Garanin

Tufts University, School of Engineering
Bachelor of Science: Double major in Mechanical Engineering and Physics
Medford, MA
May 2015

Research Experience

Lehman College
Graduate Researcher
Bronx, NY
June 2017 – Aug. 2022

- Develop classical and quantum theories to model two-dimensional spin systems
- Parallelize thousands of computations using multithreading and distributed computing
- Analyze program outputs by visualizing results and performing statistical tests
- Present results to audiences of scientific backgrounds at national conferences

NASA Climate Change Research Initiative
Graduate Student Research Assistant
New York, NY
Oct. 2021 – Aug. 2022

- Automate retrieval and analysis of over 40 years of Landsat optical data using Python
- Propose a methodology based on recent literature to measure flooding using Sentinel-1 data
- Integrate data from NOAA, USGS, ASF, and citizen scientists into a cohesive workflow
- Tailor presentations to heterogeneous audiences of experts and local teachers

Tufts Superconductivity Lab
Lab Assistant
Medford, MA
May 2013 – Sept. 2014

- Measured the conductivity of superconducting wire under tension and pressure
- Simulated the wire in experimental conditions using ANSYS to pinpoint locations of stress
- Soldered electronics and drafted parts to send to machinists

Publications

- A. Derras-Chouk, E. M. Chudnovsky, and D. A. Garanin, Dynamics of the collapse of a ferromagnetic skyrmion in a centrosymmetric lattice, *Physical Review B* **105**, 134432 (2022).
- A. Derras-Chouk, E. M. Chudnovsky, and D. A. Garanin, Quantum States of a Skyrmion in a Two-Dimensional Antiferromagnet, *Physical Review B* **103**, 224423-(8) (2021).
- A. Derras-Chouk and E. M. Chudnovsky, Skyrmions Near Defects. *Journal of Physics: Condensed Matter* **33**, 195802-(10) (2021).
- A. Derras-Chouk, E. M. Chudnovsky, D. A. Garanin. Thermal Collapse of a Magnetic Skyrmion. *Journal of Applied Physics* **126**, 083901 (2019). (*Featured Selection*)
- A. Derras-Chouk, E. M. Chudnovsky, D. A. Garanin. Quantum Collapse of a Magnetic Skyrmion. *Phys. Rev. B* **98**, 024423 (2018). (*Editors's Suggestion*)
- A. Derras-Chouk, E. M. Chudnovsky, D. A. Garanin, R. Jaafar. Graphene Cantilever under Casimir Force. *Journal of Physics D* **51**, 19. (2018).

Selected Presentations

- A. Derras-Chouk, E.M. Chudnovsky, D. A. Garanin. "Skyrmion Collapse: Quantum and Thermal Decay." Poster presentation delivered at Aspen Winter Conference 2020: Future directions in topological states of matter, Aspen, CO, Jan. 13, 2020
- A. Derras-Chouk, E. M. Chudnovsky, D. A. Garanin. "Quantum Collapse of a Magnetic Skyrmion." Oral presentation delivered at APS March Meeting, Boston, MA, Mar. 8, 2019
- A. Derras-Chouk, E. M. Chudnovsky, D. A. Garanin, R. Jaafar. "Graphene Cantilever under Casimir Force." Oral presentation delivered at APS March Meeting, Los Angeles, CA, Mar. 8, 2018

Teaching Experience

Lehman College
Adjunct Lecturer

The Bronx, NY
Aug. 2017 – May 2021

- Taught physics labs to over 50 students a semester, emphasizing experimental design
- Assessed student understanding through written assignments and problem-solving sessions
- Redesigned seven experiments for remote learning and incorporated student feedback

Success Academy Charter Schools
Computer Science Lead Teacher

The Bronx, NY
Aug. 2015 – May 2016

- Engaged students in a progressive pedagogical approach to computer science
- Developed both professional and teaching skills in monthly network-wide trainings

Tufts Office of Physics and Astronomy
Teaching Assistant

Medford, MA
Sept. 2014 – May 2015

- Tested and set up electronic equipment for undergraduates in biweekly lab sessions
- Enforced lab safety standards and replaced faulty, unsafe components when necessary

Additional Experience

EnergyWatch

New York, NY

Software Development Intern

May 2016 – Aug. 2016

- Built a quality assurance program to test functionality of hundreds of links on company site
- Sought feedback from senior software developers to optimize program design in Java
- Integrated the testing software with an alert system that notified developers of issues

Tufts Technology Services

Medford, MA

Customer Support Representative

May 2013 – Jan. 2015

- Troubleshoot computer issues with both faculty and students in person and remotely
- Acted as the first line of support in all hardware issued at the computer lab and library

Community Service

Word Up Community Bookshop

New York, NY

Collective Member & Donation Analyst

September 2017 – Present

- Streamline collection of donation data from multiple sources by automating with Python
- Summarize recent donation activity to present to other members of the collective

Honors and Awards

Graduate Center Dissertation Fellowship

2020-2021

Physics Tithe Fellowship

2018-2022

Skills

Programming languages: Julia, Python, C++, Java

Software: Mathematica, Matlab, LabView, ANSYS, SolidWorks, AutoCAD