Nicole M. Ford

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Education

McGill University 2021 – Present
Master of Science, Physics
Advisor: Daryl Haggard

Williams College 2016 – 2020
Bachelor of Arts, Astrophysics & Studio Art
Highest Honors in Astrophysics
Advisor: Anne Jaskot

Experience

Research Intern - Computational Astrophysics Aug 2020 – Present
Lawrence Berkeley National Laboratory, DOE SULI Program
Advisors: Dr. Ann Almgren, Dr. Donald Willcox, & Dr. Sherwood Richers
- Simulating Type I x-ray bursts and neutrino emission around neutron stars/mergers using adaptive mesh refinement (AMReX, Castro codes) and particle-in-cell (Emu code) techniques.

Undergraduate Thesis Researcher - Galaxy Observations 2019 – 2020
Williams College, Clare Boothe Luce Scholar Program
Advisor: Professor Anne Jaskot
- Testing proposed indicators for ionizing radiation escape in a new sample of low-redshift star forming galaxies, using *Hubble* & *SDSS* spectra.

Research Intern - Cosmic Ray Observations Jan – Jul 2019
CERN and University of Geneva, Boston University Geneva Physics Program
Advisor: Dr. Maura Graziani
- Tracking the ratio of positrons to electrons from CERN's Alpha Magnetic Spectrometer cosmic ray particle data, following variations in solar activity.

Research Assistant - Galaxy Observations May – Aug 2018
University of Massachusetts, Amherst, Williams College Summer Science Research Fellowship
Advisor: Professor Anne Jaskot
- Analysis of Green Pea galaxies gas ionization structures using *Hubble* optical photometric data, searching for regions where ionizing radiation might escape.

REU Intern - Planet Transit Observations May – Aug 2017
Wellesley College, Keck Northeast Astronomy Consortium (KNAC) NSF REU program
Advisor: Professor Kim McLeod
- Searching for planet transits in light curve data, in collaboration with the Kilodegree Extremely Little Telescope group.

Honors & Awards

McGill Space Institute Fellowship, McGill University 2021

AAS Chambliss Astronomy Achievement Award, Undergraduate Student Prize Winner 2020

Clare Boothe Luce Scholar, Williams College 2018

Publications

Refereed Contributions

Richers, S., Willcox, D. E., **Ford, N. M.**, and Myers, A., Particle-in-Cell Simulation of the Neutrino Fast Flavor Instability, PRD 103.8 (2021). [ads]

Harpole, A., **Ford, N. M.**, Eiden, K., Zingale, M., Willcox, D. E., Cavecchi, Y., Katz, M. P., Dynamics of Laterally Propagating Flames in X-ray Bursts. II. Realistic Burning & Rotation, ApJ 912.36 (2021). [ads]

Richers, S., Willcox, D. E., **Ford, N. M.**, and Myers, A., Neutrino Fast Flavor Turbulence in Three Dimensions (in prep., spring 2021)

Flury, S., et al. (*incl.* **Ford, N. M.**), The Low-Redshift Lyman Continuum Survey I: Introduction and Sample Properties (in prep., spring 2021)

Flury, S., et al. (*incl.* **Ford, N. M.**), The Low-Redshift Lyman Continuum Survey II: First Insights into LyC Diagnostics (in prep., spring 2021)

Non-Refereed Contributions

Ford, N. M., Optical Properties of Low-Redshift Star-Forming Galaxies with Potential Ionizing Radiation Escape, 2020, *Williams College Honors Thesis*. [online]

Abstracts & Conference Proceedings

Ford, N. M. & Jaskot, A., Optical Properties of Low-Redshift Star-Forming Galaxies with Potential Lyman Continuum Escape, 2020, *American Astronomical Society Meeting Abstracts #235*. [ads]

Ford, N. M., Optical Properties of Low-Redshift Star-Forming Galaxies with Potential Lyman Continuum Escape, *Keck Northeast Astronomy Consortium 2019 Meeting Abstracts*. [proceedings]

Markees, G., **Ford, N. M.**, Sheraden Cox, L., & Shi, C., Searching for Exoplanets with Wellesley's 24" Telescope, *Keck Northeast Astronomy Consortium 2017 Meeting Abstracts*. [proceedings]

PRESENTATIONS

"Dynamics of Laterally Propagating Flames in X-ray Bursts. II. Realistic Burning & Rotation"
Poster: American Astronomical Society 237th Meeting, January 2021

"Optical Properties of Low-Redshift Star-Forming Galaxies with Potential Ionizing Radiation Escape"
Poster: American Astronomical Society 235th Meeting in Honolulu, HI, January 2020
Poster & Talk: Conference for Undergraduate Women in Physics at Yale, January 2020
Talk: KNAC Fall 2019 Conference at Vassar College, October 2019

"Imaging Green Pea Galaxies"
Poster: KNAC Fall 2018 Conference at Middlebury College, October 2018

"Searching for Exoplanets with Wellesley's 24" Telescope"
Talk: KNAC Fall 2017 Conference at Wesleyan University, October 2017

COMPUTER TIME ALLOCATIONS

Senior Investigator on a NERSC 2021 Allocation, *Neutrino Flavor Transformation in Neutron Star Mergers* (18 M MPP hours)

Co-Investigator on a NERSC 2021 Allocation, *Three-dimensional studies of white dwarfs, massive stars, and neutron star systems* (30 M MPP hours)

Senior Investigator on a BRIDGES/2 2021 Allocation, *Neutrino Flavor Instabilities in Neutron Star Mergers* (4000 GPU hours)

OUTREACH & TEACHING

STEM Mentor, Fab Fem Organization — March 2020 – Present
- Present an hour-long workshop "Being an Astrophysicist" with 60+ attendees from around the world.

STEM Mentor, Girl Genius Organization — March 2020 – Present
- Monthly advising meetings for middle and high school girls interested in STEM.
- Assisted middle-schooler Hansa Giridhar in writing her book "Astrophysics for Kids" (on Amazon).

Women & Gender Minorities in Physics & Astronomy Co-President, Williams College 2016 – 2020
- Ensured all Physics & Astronomy professors include preferred pronouns on faculty web-pages.

- Coordinated trip to Yale's 2020 Conference for Undergraduate Women in Physics, with record turnout.

Teaching Assistant, Williams College Hopkins Observatory 2017 – 2020
Supervisors: Dr. Steven Souza & Dr. Kevin Flaherty
- Instructed students on 24" telescope operation, image processing, and astronomy problem sets.

MEMBERSHIPS American Astronomical Society, American Physical Society, Sigma Xi, SACNAS, 500 Women Scientists

SKILLS **Coding** Python (four years), C++ (two years), UNIX (four years), LaTeX, IDL, Mathematica

Numerical Techniques Error Analysis, Discrete Differentiation and Integration, Fast Fourier Transforms

Languages English and French