Nicole M. Ford

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Education

McGill University, Doctor of Philosophy, Physics — 2023 – Present
Advisor: Daryl Haggard

McGill University, Master of Science, Physics — 2021 – 2023
Advisors: Daryl Haggard & John Ruan

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

Experience

Graduate Researcher - High Energy Astrophysics — Aug 2021 – Present
Trottier Space Institute at McGill (TSI)
Advisors: Professor Daryl Haggard & Professor John Ruan

- (PhD) Monitoring X-ray flux and variability of several low luminosity AGNs targeted by the *Event Horizon Telescope* collaboration to learn about their accretion and links to radio/multi-wavelength emission.
- (MSc) Identified ion absorption signatures for different types of kilonovae using simulated spectra and machine learning techniques, and developed kilonova observational follow-up code for use with *CFHT*.

Research Intern - Computational Astrophysics — Aug 2020 – July 2021
Lawrence Berkeley National Laboratory, DOE SULI Program
Advisors: Dr. Ann Almgren, Dr. Donald Willcox, & Dr. Sherwood Richers

- Simulated 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

- Tested indicators for ionizing radiation escape in nearby 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

- Tracked solar activity via the *Alpha Magnetic Spectrometer*'s measured cosmic ray positron/electron ratio.

Research Assistant - Galaxy Observations — May – Aug 2018
University of Massachusetts, Amherst, Williams College Summer Science Research Fellowship
Advisor: Professor Anne Jaskot

- Searched for ionizing radiation escape in Green Pea galaxies' gas ionization structures using *Hubble* data.

REU Intern - Planet Transit Observations — May – Aug 2017
Wellesley College, Keck Northeast Astronomy Consortium (KNAC) NSF REU program
Advisor: Professor Kim McLeod

- Searched for light curve planet transits, collaboration with the Kilodegree Extremely Little Telescope group.

Honors & Awards

Doctoral Research Award, Fonds de recherche du Québec – Nature et technologies — 2023-2027

McGill Becentennial Art & Science Exhibition "Traditional Media" Prize, McGill University — 2022

McGill Space Institute Fellowship, McGill University — 2021-present

AAS Chambliss Astronomy Achievement Award, Undergraduate Student Prize Winner — 2020

Clare Boothe Luce Scholar, Williams College — 2018

PUBLICATIONS

Refereed Contributions

Ford, N. M., Nowak, M., Ramakrishnan, V., et al., Tracking X-ray Variability in Next Generation EHT LLAGN Targets, *Submitted to ApJ*.

Algaba, J. C. et al. (*incl.* **Ford, N. M.**), Broadband Multi-wavelength Properties of M87 during the 2018 EHT Campaign including a Very High Energy Flaring Episode, A&A 692, A140 (2024). [ads]

Ford, N. M., Vieira, N., Ruan, J. J., Haggard, D., KilonovAE: Exploring Kilonova Spectral Features with Autoencoders, ApJ 961.1 (2024). [ads]

Vieira, N., Ruan, J. J., Haggard, D., **Ford, N. M.**, et al., Spectroscopic r-Process Abundance Retrieval for Kilonovae II: Lanthanides in the Inferred Abundance Patterns of Multi-Component Ejecta from the GW170817 Kilonova, ApJ 962.1 (2024). [ads]

Vieira, N., Ruan, J. J., Haggard, D., **Ford, N. M.**, et al., Spectroscopic r-Process Abundance Retrieval for Kilonovae I: The Inferred Abundance Pattern of Early Emission from GW170817, ApJ 944.2 (2023). [ads]

Flury, S., et al. (*incl.* **Ford, N. M.**), The Low-Redshift Lyman Continuum Survey II: New Insights into LyC Diagnostics, ApJ 930.2 (2022). [ads]

Flury, S., et al. (*incl.* **Ford, N. M.**), The Low-redshift Lyman Continuum Survey. I. New, Diverse Local Lyman Continuum Emitters, ApJS 260.1 (2022). [ads]

Richers, S., Willcox, D. E., **Ford, N. M.**, and Myers, A., Particle-in-Cell Simulation of the Neutrino Fast Flavor Instability, PRD 104.10 (2021). [ads]

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]

Non-Refereed Contributions

Nair, D. et al. (*incl.* **Ford, N. M.**), Demographics of black holes at $< 100R_g$ scales: accretion flows, jets, and shadows, *Proceedings of the 16th EVN Symposium* (2024). [ads]

Ford, N. M., KilonovAE: Exploring Kilonova Spectral Features with Autoencoders, *McGill University Masters Thesis* (2023).

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

SELECT CONFERENCE & SEMINAR TALKS

Talk: The Event Horizon Telescope Collaboration Winter Meeting	December 2024
Talk: Joint NICER/IXPE Workshop 2024	July 2024
Talk: Event Horizon Telescope Collaboration Summer Meeting	May 2024
Talk: Centre de Recherche en Astrophysique du Quebéc Summer Meeting	May 2024
Poster: 21st American Astronomical Society High Energy Astrophysics Division Meeting	April 2024
Talk: The Event Horizon Telescope Collaboration Winter Meeting	December 2023
Talk: Centre de Recherche en Astrophysique du Quebéc Summer Meeting	May 2023
Talk: Bishop's University Invited Talk	March 2023
Talk: American Astronomical Society 237th Meeting	January 2023
Talk: Centre de Recherche en Astrophysique du Quebéc Summer Meeting	May 2022
Poster: American Astronomical Society 237th Meeting	January 2021
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
	Poster: KNAC Fall 2018 Conference at Middlebury College	October 2018
	Talk: KNAC Fall 2017 Conference at Wesleyan University	October 2017

Observing Time Allocations

EVN+eMERLIN: "Collimation and acceleration of the M84 jet: synergy with EVN+e-MERLIN and EHT", 9 hr, PI: D. Nair **(Co-I: N. M. Ford)**

Chandra+HST+VLA Cycle 26: "Community Discovery Program: CXO/VLA/HST observations of GW-detected compact mergers in O4", 470 ks (Chandra) and 33 orbits (HST) and 33 hr (VLA), PI: D. Haggard, R. Margutti. W. F. Fong, S. Campana (**Co-I: N. M. Ford**)

NuSTAR+NICER Cycle 10: "NuSTAR/NICER/Event Horizon Telescope Studies of Low Luminosity AGNs: Jets and Accretion", 50 ks (NuSTAR) and 42 ks (NICER), **PI: N. M. Ford**

VLA (Director's Discretionary Time): "Concurrent Radio Coverage of 6 September 2024 Multiwavelength Campaign of Sgr A*", 7 hr, PI: J. Michail, (**Co-I: N. M. Ford**)

ALMA Cycle 11: "Imaging M84 at $<$ 50 gravitational radii: jets and accretion inflow", 8 hr, PI: N. Nagar, (**Co-I: N. M. Ford**)

James Webb Space Telescope Cycle 2: "Sgr A* as Particle Accelerator: What Drives the Black Hole's Variable IR and X-ray Emission?", 29.88 hr, PI: J. Hora (**Co-I: N. M. Ford**)

Gemini North 2023A: "Tick Tock: A Spectroscopic Investigation into an Imminently Merging Supermassive Black Hole Binary Candidate", 7.8 hr, **PI: N. M. Ford**

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)

Teaching

Teaching Assistant, McGill University Department of Physics — Aug 2021 – Dec 2021
Supervisor: Prof. Katelin Schutz

Teaching Assistant, Williams College Hopkins Observatory — 2017 – 2020
Supervisors: Dr. Steven Souza & Dr. Kevin Flaherty

Student Research Supervision

Chaitanya Kumar, University of Toronto (U3)	May 2024 – Aug 2024
Marissa Lindon, McGill University (U3) (co-supervised w/Nicholas Vieira)	Jan 2023 – Aug 2023
Charlotte Garcia, McGill University (U3) (co-supervised w/Nicholas Vieira)	Jan 2023 – Apr 2023

Academic Service

Executive Secretary, NICER Cycle 7 General Observer Review Panel	November 2024
Chair, *NICER Science II* Session at the Joint NICER/IXPE Workshop	July 2024

Science Communication

"Black Holes: The Cosmic Vacuum Cleaners", Astronomy On Tap, Montreal, QC	Sept 2023
"Intro to Science Visualization", Trottier Space Institute Lunch Talk, Montreal, QC	Oct 2022
"How To Be an Astrophysicist", McGill Bicentennial Space Week, Montreal, QC	May 2022

OUTREACH & INREACH	**Astronomy on Tap Organizing Committee**, McGill / University of Montreal	Sept 2024 – present
	Scientista McGill Mentor, McGill University	Sept 2023 – present
	Science in Space Mentor, TSI and Dell Technologies: Girls Who Game	Oct 2022 – present
	Observatory Guide, McGill Anna I. MacPherson observatory	Sept 2022 – Sept 2023
	Graduate Seminar Coordinator, TSI	Sept 2022 – Jan 2024
	AstroMcGill Outreach Coordinator, TSI	Jan 2022 – Aug 2022
	Physics Hackathon Judge, Department of Physics	Nov 2021, 2022
	STEM Mentor, Fab Fem Organization	Mar 2020 – Mar 2021
	Women & Gender Minorities in Physics & Astronomy Co-President, Williams College	2016 – 2020
PROFESSIONAL MEMBERSHIPS	**Event Horizon Telescope Collaboration** AGN, Time Domain, and Multi-wavelength Working Groups	Aug 2023 – present
	CASTOR Time Domain Science Working Group	2022 – present
	Centre de Recherche en Astrophysique du Quebéc	2021 – present
	Canadian Astronomical Society	2021 – present
	American Astronomical Society	2020 – present