Ahmed Shaban

arshaban@ncsu.edu | ashabano.github.io | +1 (984) 888-9996
in/ashabano | github.com/ashabano | Raleigh, NC, USA

Education

2018 – 2024 **Doctor of Philosophy (PhD) in Physics**, North Carolina State University.
Thesis title: *"Spatially Resolved Galactic Outflows in Gravitationally Lensed Galaxies"*
Advisor: Dr. Rongmon Bordoloi

2018 – 2020 **Master of Science (MS) in Physics**, North Carolina State University.

2014 – 2018 **Bachelor of Science (BSc) in Physics**, Zewail City of Science and Technology, Egypt.
Concentration: *Astrophysics*.

Employment History

2025 – · · · · **Postdoctoral Research Scholar,** North Carolina State University.
Advisor: Dr. Rongmon Bordoloi

2019 – 2024 **Graduate Research Assistant (RA)**, North Carolina State University.

2018 – 2022 **Graduate Teaching Assistant (TA)**, North Carolina State University.

- TA & guest lecturer for the Solar system Astronomy class (110 Students). *Fall 2022*
- Training students on using Telescopes in the Senior Physics Lab. *Fall 2021 & 2022*
- TA for introductory physics curriculum development. *Summer 2022*
- TA for the graduate Astrophysics class. *Spring 2022*
- Instructor for E&M Lab (total: 152 Students). *Spring 2019 & Fall 2021*
- Tutor at the Physics Tutorial Center (PTC). *Spring 2019*
- Online tutor for E&M for Engineers and Scientists. *Fall 2018*

2018–2018 **Teaching Assistant (TA)**, Zewail City of Science and Technology, Egypt.

- Teaching Assistant for PEU 331 (Stellar Structure & Evolution) *Spring 2018*

Research Publications

Journal Articles

1. **A. Shaban**, R. Bordoloi, J. M. O'Meara, *et al.*, "Spatially Resolved Circumgalactic Medium Around a Star-Forming Galaxy Driving a Galactic Outflow at $z \approx 0.8$," *Sumitted to ApJ*, Jan. 2025. arXiv: 2501.17940 [astro-ph.GA].

2. N. Giertych, **A. Shaban**, P. Haravu, and J. P Williams, "A statistical primer on classical period-finding techniques in astronomy," *Reports on Progress in Physics*, vol. 87, no. 7, 078401, p. 078 401, Jul. 2024. DOI: 10.1088/1361-6633/ad4586. arXiv: 2205.10417 [astro-ph.EP].

3. **A. Shaban**, R. Bordoloi, J. Chisholm, *et al.*, "Dissecting a 30 kpc galactic outflow at $z \sim 1.7$," *Monthly Notices of the Royal Astronomical Society*, vol. 526, no. 4, pp. 6297–6320, Dec. 2023. DOI: 10.1093/mnras/stad3004. arXiv: 2306.07328 [astro-ph.GA].

4. R. Bordoloi, J. M. O'Meara, K. Sharon, *et al.*, "Resolving the H I in damped Lyman α systems that power star formation," *Nature*, vol. 606, no. 7912, pp. 59–63, May 2022. DOI: 10.1038/s41586-022-04616-1. arXiv: 2205.08554 [astro-ph.GA].

5. **A. Shaban**, R. Bordoloi, J. Chisholm, *et al.*, "A 30 kpc Spatially Extended Clumpy and Asymmetric Galactic Outflow at z 1.7," *The Astrophysical Journal*, vol. 936, no. 1, 77, p. 77, Sep. 2022. DOI: 10.3847/1538-4357/ac7c65. arXiv: 2109.13264 [astro-ph.GA].

Conference Proceedings

1. **A. Shaban**, "Spatially Resolved Galactic Outflow at z $\sim$ 2 Using Gravitational Lensing," in *Oases in the Cosmic Desert: Understanding the Structure of the Circumgalactic Medium, Arizona State University*, Feb. 2023.

2. **A. Shaban**, R. Bordoloi, and J. O'Meara, "Small Scale Variation of Circumgalactic Medium Using Gravitational Lensing Tomography," in *American Astronomical Society Meeting Abstracts*, ser. American Astronomical Society Meeting Abstracts, vol. 241, Jan. 2023, 327.01, p. 327.01.

3. A. Darekar, **A. Shaban**, R. Bordoloi, and J. O'Meara, "Probing the circumgalactic medium using a quadruply lensed quasar system," in *American Astronomical Society Meeting Abstracts*, ser. American Astronomical Society Meeting Abstracts, vol. 54, Jun. 2022, 141.08, p. 141.08.

4. **A. Shaban** and R. Bordoloi, "A Spatially Resolved Study of Galactic Outflows in a Gravitationally Lensed Galaxy," in *American Astronomical Society Meeting Abstracts #236*, ser. American Astronomical Society Meeting Abstracts, vol. 236, Jun. 2020, 307.01, p. 307.01.

Invited Talks

Feb. 2024
- *"Studying Galactic Winds via Gravitational Lensing"*, Invited talk at NC State University for visiting undergraduate students from UNC-Pembroke, Raleigh, NC.

Apr. 2023
- *"Spatially Resolving Galactic Outflow at High-z"*, Invited Talk at Dr. Fabian Heitsch's group retreat at UNC-Chapel Hill, Durham, NC.

Oct. 2023
- *"Cosmic Lens on Galactic Winds"*, Invited talk at the Galaxies and AGN journal club at the Space Telescope Science Institute (STScI), Baltimore, Maryland.
- *"Dissecting a 30 kpc Galactic Outflow"*, Invited talk at the Astro-coffee Journal Club at the Johns Hopkins University, Baltimore, Maryland.
- *"Spatially Resolving Galactic Outflows and the CGM using Gravitational Lensing"*, Invited talk at the Low-Density Universe subgroup at the Space Telescope Science Institute (STScI), Baltimore, Maryland.

Observing

Observing Experience

- W. M. Keck Observatory, Keck II Telescope (Total: 9 nights):
  - Keck Cosmic Web Imager (KCWI): 8 nights.
  - Echellette Spectrograph & Imager (ESI): 1 night.

Observing Proposals as a Co-Investigator

- NASA Keck Time 2024A: "*Spatially Resolved CGM metallicity maps at z>2*", PI: R. Bordoloi, ID: 25/2024A_N110, Total Time Awarded: 2 nights using KCWI on Keck Telescope II.

Mentoring

2021–2024 — Ayesha Darekar, Undergraduate student, North Carolina State University.
I co-advised Ayesha, alongside Dr. Rongmon Bordoloi, on her undergraduate research project, where she studied the absorbing system in the foreground of a gravitationally lensed quasar using KCWI.

Service and Public Outreach

2019 – · · · — Co-organizer of the weekly Astrophysics journal club, NC State University.

Oct. 2024 — Co-organizer of star gazing event at NC State University.

Feb. 2024 — Juror at The 2024 US Invitational Young Physicists Tournament, Raleigh, NC.

Jan. 2023 — Volunteer at the Astronomy Days event at NC Museum of Natural Sciences.

Sept. 2022 — Organizing a stargazing event in Oak Island with Egyptian students from NC State University.

Nov. 2019 — Organizing an event to observe the 2019 Transit of Mercury at NC State University.

Skills

Astrophysics Softwares — DS9, QFitsView, and Astropy.

Operating Systems — Linux, Mac OS, and Windows.

Web Dev — HTML and CSS.

Programming — Python (`Astropy`, `matplotlib`, `numpy`, `scipy`, `Pandas`, `Sckikit-Learn`, `Tensorflow`, `Keras`), Mathematica, Matlab, R, Java, Julia, and SQL.

Awards and Achievements

Jun. 2022 — **Graduate School Summer Fellowship**, North Carolina State University, 2500$.

2014-2018 — **Merit-Based Scholarship** for my undergraduate studies at the University of Science and Technology at Zewail City of Science and Technology, Egypt.

References

Available Upon Request