

# Ahmed Shaban

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## Education

- 2018 – 2024    📖 **Doctor of Philosophy (PhD) in Physics**, North Carolina State University.  
Thesis title: “*Spatially Resolved Galactic Outflows in Gravitationally Lensed Galaxies*”  
Advisor: Prof. Rongmon Bordoloi
- 2018 – 2020    📖 **Master of Science (MS) in Physics**, North Carolina State University.
- 2014 – 2018    📖 **Bachelor of Science (B.Sc.) in Physics**, Zewail City of Science and Technology, Egypt.  
Concentration: *Astrophysics*.

## Employment History

- 2025 – . . . .    📖 **Postdoctoral Fellow**, University of South Carolina.  
Advisor: Prof. Varsha Kulkarni
- 2025 – 2025    📖 **Postdoctoral Research Scholar**, North Carolina State University.  
Advisor: Prof. 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*

## 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.
- 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.

## Invited Talks (continued)

- “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.
- Apr. 2023 ■ “Spatially Resolving Galactic Outflow at High- $z$ ”, Invited Talk at Dr. Fabian Heitsch’s group retreat at UNC-Chapel Hill, Durham, NC.

## Observing

### Observing Experience

- W. M. Keck Observatory, Keck II Telescope (Total: 11 nights):
  - Keck Cosmic Web Imager (KCWI): 10 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.

## Academic Service

- 2022 – . . . ■ Refereed two peer-reviewed publications for *The Astrophysical Journal* “ApJ” (1 paper as a junior referee), and *Monthly Notices of the Royal Astronomical Society* “MNRAS” (1 paper).



## 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, Scikit-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.

## 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  $z \approx 0.8$ ," *The Astrophysical Journal*, vol. 986, no. 2, 190, p. 17, Jun. 2025.  DOI: 10.3847/1538-4357/add0b9. 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. 078401, 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  $\alpha$  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  $z \sim 1.7$ ," *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 Outflows and Circumgalactic Gas in Gravitationally Lensed Galaxies," in *American Astronomical Society Meeting Abstracts*, ser. American Astronomical Society Meeting Abstracts, vol. 246, Jun. 2025, 2025n4i314p04, p. 314.04D.
- 2 **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.

- 3 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.
- 4 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.
- 5 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.

## References

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Available Upon Request