

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 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*

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.
- 📖 “*Dissecting a 30 kpc Galactic Outflow*”, Invited talk at the Astro-coffee Journal Club at the Johns Hopkins University, Baltimore, Maryland.

Invited Talks (continued)

- “*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 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 $z \sim 1.7$," *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, 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

Available Upon Request