AHMED SHABAN

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EDUCATION

- **Ph.D in Physics** *Aug. 2018 - Fall 2024*
  North Carolina State University
  Thesis: *"Spatially Resolved Galactic Outflows in Gravitationally Lensed Galaxies"*
  Advisor: Dr. Rongmon Bordoloi
- **Master of Science in Physics** *Aug. 2018 - Dec. 2020*
  North Carolina State University
- **Bachelor of Science** *Sept. 2014 - June 2018*
  Major: Physics of the Earth and Universe. **Concentration**: Astrophysics
  University of Science and Technology at Zewail City of Science and Technology, Egypt.
  Honors: Cum Laude.

  Summary of the Course Work: Linear Algebra | Differential Equations | Mathematical Physics | Analytical Mechanics | Advanced Electricity and Magnetism | Advanced Quantum Mechanics | Physical Optics | Statistical Physics | General Relativity | Computational Physics | Cosmology | Astronomy | Astrophysics.

PROFESSIONAL EXPERIENCE

Research Assistant, Department of Physics, NC State University *May 2019 - Present*

Teaching Assistant, Department of Physics, NC State University

- Teaching Assistant & guest lecturer for PY124 (Solar system Astronomy; 110 Students). *Fall 2022*
- Training students on how to use Telescopes in PY452 (Senior Physics Lab). *Fall 2021& 2022*
- Teaching Assistant for PY101 curriculum development. *Summer 2022*
- Teaching Assistant for PY543 (Graduate Astrophysics) *Spring 2022*
- Instructor for PY 209 (E&M Lab; total: 152 Students). *Spring 2019 & Fall 2021*
- Tutor at the Physics Tutorial Center (PTC). *Spring 2019*
- Online tutor for PY208 (E&M for Engineers and Scientists). *Fall 2018*

Teaching Assistant, Zewail City of Science & Technology, Egypt

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

OBSERVING

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

OBSERVING PROPOSALS 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

- Ayesha Darekar: Undergraduate student. *Jan. 2021 - May 2024*
  I am co-advising Ayesha with Dr. Rongmon Bordoloi for her undergraduate research project. She studies the absorbing system in the foreground of a gravitationally lensed quasar systems using KCWI.

AWARDS/SCHOLARSHIPS

- **Graduate School Summer Fellowship**: NC State University, 2500$. *June 2022*
- **Merit-Based Scholarship** for my undergraduate studies at University of Science and Technology at Zewail City, Egypt. *Sept. 2014 - June 2018*

SERVICE AND PUBLIC OUTREACH

- Co-organizer of the weekly Astrophysics journal club, NC State University. *2019- present*
- Co-Organizer of star gazing event at NC State University. *Oct. 2024*
- Juror at The 2024 US Invitational Young Physicists Tournament, Raleigh, NC. *Feb. 2024*
- Volunteer at the astronomy days event at NC Museum of Natural Sciences. *Jan. 2023*
- Organizing a star gazing event in Oak island with the Egyptian students at NC State. *Sept. 2022*
- Organizing an event to observe the 2019 Transit of Mercury at NC State Unviersity. *Nov. 2019*

TECHNICAL SKILLS

- **Programming:** Python (`Astropy, matplotlib, numpy, scipy, Pandas, Sckikit-Learn, Tensorflow, Keras`), Matlab, R, Java, and SQL.
- **Symbolic Programming:** Mathematica.
- **Operating Systems:** Linux and Windows.
- **Astrophysics Softwares:** DS9, QFitsView, and Astropy.

INVITED TALKS

- *"Resolving the Circumgalactic Medium and Galactic Winds with Gravitational Lensing"*, Virtual invited talk at Arizona State University, Tempe, Arizona, on September 6, 2024.
- *"Studying Galactic Winds via Gravitational Lensing"*, Invited talk at NC State University for visiting undergraduate students from UNC-Pembroke, Raleigh, NC, on Feburary 10, 2024.
- *"Spatially Resolving Galactic Outflow at High-z"*, Invited Talk at Dr. Fabian Heitsch's group retreat at UNC-Chapel Hill, Durham, NC, on April 6, 2023.
- *"Cosmic Lens on Galactic Winds"*, Invited talk at the Galaxies and AGN journal club at the Space Telescope Science Institute (STScI), Baltimore, Maryland, on October 31, 2023.

- *"Dissecting a 30 kpc Galactic Outflow"*, Invited talk at the Astrocoffee journal club at the Johns Hopkins University, Baltimore, Maryland, on October 30, 2023.
- *"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, on October 30, 2023.

CONFERENCE TALKS & POSTERS

- **Shaban, A.** 2023, "**Spatially Resolved Galactic Outflow at z ∼ 2 Using Gravitational Lensing**". Talk+Poster. In *'Oases in the Cosmic Desert: Understanding the Circumgalactic Medium'* conference, Arizona State University.
- **Shaban, A.**, Bordoloi, R. and O'Meara, J., 2023, January. "**Small Scale Variation of Circumgalactic Medium Using Gravitational Lensing Tomography**". American Astronomical Society Meeting #241, id. 327.01. Bulletin of the American Astronomical Society, Vol. 55, No. 2 e-id 2023n2i327p01
- **Shaban, A.** and Bordoloi, R., 2020, June. "**A Spatially Resolved Study of Galactic Outflows in a Gravitationally Lensed Galaxy**". In *American Astronomical Society Meeting Abstracts# 236* (Vol. 236, pp. 307-01).

LIST OF PUBLICATIONS

ORCID: 0000-0002-8858-7875

1. Giertych, N., **Shaban, A.**, Haravu, P., & Williams, J., "A Statistical Primer on Classical Period-Finding Techniques in Astronomy", 2024, *Reports on Progress in Physics*, 87 (7), 078401.
2. **Shaban, A.**, Bordoloi, R., Chisholm, J., et al., "Dissecting a 30 kpc Galactic Outflow at $z \sim 1.7$", 2023, *Monthly Notices of the Royal Astronomical Society (MNRAS)*, 526 (4), 6297.
3. **Shaban, A.**, Bordoloi, R., Chisholm, J., et al., "A 30 kpc Spatially Extended Clumpy and Asymmetric Galactic Outflow at $z \sim 1.7$", 2022, *The Astrophysical Journal*, 936 (1), 77.
4. Bordoloi, R., O'Meara, J., M., Sharon, K., Rigby, J. R., Cooke, J., **Shaban, A.**, et al., "Resolving the H I in damped Lyman α systems that power star formation", 2022, *Nature*, 606, pages 59-63.