

Curriculum Vitae — James Ross Cheshire IV

Division of Physics, Mathematics, and Astronomy
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Education

2024 Doctor of Philosophy (Ph.D.), Astrophysics, University of Minnesota Twin Cities
2017 Bachelor of Science (B.S.), Physics and Astronomy, Concentration in Computational Physics, University of Illinois at Urbana-Champaign

Research Experience

2024– *David and Ellen Lee Postdoctoral Scholar Research Associate in Physics, California Institute of Technology (Caltech). Supervisor: Prof. James Bock.*

2017–2024 *Graduate Research Assistant, Pryke Laboratory, University of Minnesota. Supervisor: Prof. Clement Pryke.*

2015–2017 *Undergraduate Research Assistant, Observational Cosmology Laboratory, University of Illinois at Urbana-Champaign. Supervisor: Prof. Joaquin Vieira.*

Teaching Experience

2018–2019 *Head Teaching Assistant, Minnesota Institute for Astrophysics, University of Minnesota, Minneapolis, MN*
– Astronomy 1001: Exploring the Universe (Fall 2018, Spring 2019)

2017–2018 *Teaching Assistant, Minnesota Institute for Astrophysics, University of Minnesota, Minneapolis, MN*
– Astronomy 1001: Exploring the Universe (Fall 2017, Spring 2018)

Scientific Collaborations

- BICEP/Keck Collaboration
- SPHEREx Collaboration
- CMB-S₄ Collaboration

Refereed Journal Publications

- A. Nadolski *et al.* Broadband, Millimeter-Wave Antireflection Coatings for Large-Format, Cryogenic Aluminum Oxide Optics. *Applied Optics* **59**, 3285–3295 (2020).
- BICEP/Keck Collaboration *et al.* BICEP/Keck XII: Constraints on axion-like polarization oscillations in the cosmic microwave background. *Physical Review D* **103**, 042002 (2021).

- BICEP/Keck and SPTpol Collaborations *et al.* A Demonstration of Improved Constraints on Primordial Gravitational Waves with Delensing. *Physical Review D* **103**, 022004 (2021).
- BICEP/Keck Collaboration *et al.* BICEP/Keck XIII: Improved Constraints on Primordial Gravitational Waves using Planck, WMAP, and BICEP/Keck Observations through the 2018 Observing Season. *Physical Review Letters* **127**, 151301 (2021).
- BICEP/Keck Collaboration *et al.* BICEP/Keck XV: The BICEP3 Polarimeter and the First Three Year Data Set. *The Astrophysical Journal* **927**, 77 (2022).
- BICEP/Keck Collaboration *et al.* BICEP/Keck XIV: Improved constraints on axion-like polarization oscillations in the cosmic microwave background. *Physical Review D* **105**, 022006 (2022).
- BICEP/Keck XVI: Characterizing Dust Polarization through Correlations with Neutral Hydrogen. *The Astrophysical Journal* **945**, 72 (2023).
- BICEP/Keck XVII: Line of Sight Distortion Analysis: Estimates of Gravitational Lensing, Anisotropic Cosmic Birefringence, Patchy Reionization, and Systematic Errors. *The Astrophysical Journal* **949**, 43 (2023).

Selected Conference Proceedings

- C. Zhang, P.A.R. Ade, Z. Ahmed *et al.* Characterizing the Sensitivity of 40 GHz TES Bolometers for BICEP Array. *Journal of Low Temperature Physics* **199**, 968–975 (2020).
- A. Schillaci, P.A.R. Ade, Z. Ahmed *et al.* Design and Performance of the First BICEP Array Receiver. *Journal of Low Temperature Physics* **199**, 976–984 (2020).
- L. Moncelsi, P.A.R. Ade, Z. Ahmed *et al.* Receiver development for BICEP Array, a next-generation CMB Polarimeter at the South Pole. *Proceedings of SPIE* **11453** (2020).
- A. Soliman, P.A.R. Ade, Z. Ahmed, *et al.* 2022 upgrade and improved low frequency camera sensitivity for CMB observation at the South Pole. *Proceedings of SPIE* **12190**, 533–539 (2022).
- A. Schillaci, P.A.R. Ade, Z. Ahmed, *et al.* BICEP Array: 150 GHz detector module development. Accepted by *Journal of Low Temperature Physics* (2023).
- J. Cheshire, P.A.R. Ade, Z. Ahmed, *et al.* Constraining Inflation with the BICEP/Keck CMB Polarization Experiments. Contribution to the 2024 Cosmology session of the *58th Rencontres de Moriond* (2024).

Talks & Presentations

- “Low-Cost Radio Telescope for Observations of the Galactic Plane at 21 cm”, University of Illinois Undergraduate Research Symposium (2017).
- “BICEP Array Upgrades, Primordial Gravitational Wave Constraint Forecasts, and Low-Frequency Receiver Performance”, APS April Meeting 2022, K15.004 (2022).
- “Constraining Primordial Gravitational Waves with the BICEP/Keck Series of CMB Polarization Experiments”, APS April Meeting 2023, V13.00002 (2023).