Allison M. Matthews — Curriculum Vitae

Appointments

09/2021 – present | **Vera Rubin Fellow** (*Carnegie Observatories, Pasadena, CA*)

Education

The University of Virginia (*Charlottesville, VA, USA*)
Ph.D. Astronomy (August 2021) | *Advisor: Dr. James J. Condon (NRAO, UVa)*
M.S. Astronomy (May 2017)

Lafayette College (*Easton, PA, USA*)
B.S. Physics with Honors (May 2015) | *Advisor: Dr. David Nice (Lafayette College)*
B.S. Mathematics with Honors (May 2015)

Honors and Fellowships

08/2024 | **Thacher Award** ($5,000—*given to a Carnegie postdoc "for outstanding research over the last year"*)

11/2022 – present | **Vera Rubin Fellowship** (*Carnegie Observatories*)

09/2021 – present | **Carnegie Fellowship** (*Carnegie Observatories*)

01/2022 – 01/2024 | **Carnegie DEI Mini Grant** (*$5,000—for DEI program, Carnegie Observatories*)

08/2019 – 05/2021 | **Grote Reber Doctoral Fellowship** (*National Radio Astronomy Observatory*)

08/2015 – 05/2020 | **Graduate Research Fellowship** (*National Science Foundation*)

08/2015 – 05/2021 | **Jefferson Fellowship** (*Jefferson Scholars Foundation*)

04/2016 – 05/2018 | **Graduate STEM Research Fellowship** (*Virginia Space Grant Consortium*)

05/2014 | **Honorable Mention: Barry M. Goldwater Scholar** (*The Goldwater Foundation*)

Service & Outreach

04/2024 – present | **Science Consultant, Los Angeles County Museum of Art**
Provided material (the incredible MeerKAT Galactic center image) and consulted on the current LACMA exhibition *Mapping the Infinite: Cosmologies across Cultures*.

01/2022 – present | **Advisory Board Member, Pre-Scientist Inc.**
Letters to a Pre-Scientist connects students with STEM professionals through a structured pen pal program. I serve on the Development Committee which seeks to grow the program to reach more students, there are ∼3,500 students in the 2024-2025 cohort! I have also been a long time pen pal to many inspiring "pre-scientists" from rural Illinois to downtown LA.

01/2023 – present | **Carnegie DEI Committee**
I serve as a postdoctoral representative on the Observatories DEI committee. Read more about our work here!

01/2022 – 01/2024 | **Carnegie DEI Mini Grant**
I developed and sent inquiry-based Astronomy activity kits to rural middle schools.

07/2022 – 09/2023 | **Carnegie Postdoc Representative**

01/2020 – 08/2021 | **Director, Dark Skies, Bright Kids Assessments Team**
I led a team of graduate students in designing and implementing qualitative and quantitative assessments of the Dark Skies, Bright Kids outreach program (see below). Under my leadership, we published two papers in peer-reviewed journals.

01/2018 – 04/2018 | **UVa Astronomy Graduate Admissions Representative**
I was selected by the faculty to serve as a full member of the graduate admissions committee.

08/2015 – 08/2021 | **Volunteer, Dark Skies, Bright Kids**
I was an active member of this primarily graduate student run outreach organization. Our mission is to bring the fun of science to under-served elementary school children around Virginia through hands-on, inquiry-based activities.

Public Lectures

07/2024 | **Carnegie Lecture Series (Pasadena Senior Center, Pasadena, CA)**
Invited public lecture: *Tuning Into the Invisible Universe*

04/2024 | **Carnegie Observatories Lecture Series (The Huntington, San Marino, CA)**
Invited public lecture: *Tuning Into the Invisible Universe* (recording)

11/2022 | **Carnegie Lecture Series @ PCC (Pasadena City College, Pasadena, CA)**
Invited public talk: *Tuning Into the Radio Universe*

Teaching Experience

06/2019 | **Secondary Instructor, The Southern African Sky (Cape Town, South Africa)**
Under the partnership between UVa and iXperience Cape Town, I traveled to Cape Town with Professor Kelsey Johnson to co-teach an introductory undergraduate astronomy class centered around the place of Astronomy in African culture.

06/2018 – 07/2018 | **Instructor of Record, ASTR 1270 (University of Virginia)**
Served as the instructor of record for the introductory Astronomy course: Unsolved Mysteries of the Universe. Designed my own syllabus, assignments, and assessments around active learning models and innovative teaching pedagogy.

2017 – 2022 | **Participant, Tomorrow's Professor Today**
Selected from a competitive applicant pool of graduate students at UVa to participate in seminars and workshops on teaching pedagogy and inclusivity in the classroom.

2018 – 2019 | **Participant, SciComm**
I participated in a 1-year program for NSF GRFP Fellows that provided training and experience in science communication to: engage the public; collaborate across disciplines; inspire our next generation of scientists; and to communicate with the media, and decision-makers.

Student Supervision

2024 – present | Aarna Garg, UC Santa Cruz (Carnegie Astrophysics Summer Research Internship)

2023 – present | Juan Diego Draxl Gianoni, UC San Diego (Carnegie Astrophysics Summer Research Internship)

2022 | Eleanor Hort, Pomona College (Carnegie Astrophysics Summer Research Internship)

2020 | Kiersten Bond, University of Virginia (Independent Research)

2019 | Melanie Grierson, University of Virginia (Senior Thesis)

Selected Conferences & Presentations

11/2024 | **Cornell University, Department of Astronomy Colloquium** (Ithaca, NY)
Invited Colloquium: *Constraining Cosmic History and Cosmic-Ray Physics with Radio Emission*

10/2024 | **Beyond the Edge of the Universe** (Sintra, Portugal)
Contributed talk: *Cosmic History and Cosmic-Ray Physics with Radio Emission*

10/2024 | **University of Michigan, Department of Astronomy Colloquium** (Ann Arbor, MI)
Invited Colloquium: *Constraining Cosmic History and Cosmic-Ray Physics with Radio Emission*

10/2024 | **University of Michigan, Conversations on Equity & Inclusion** (Ann Arbor, MI)
Invited talk: *Demystifying STEM through pen-pal relationships*

03/2024 | **Carnegie Observatories Colloquium** (Pasadena, CA)
Invited Colloquium: *Tuning the Dials of our Cosmic History with Radio Emission*

11/2023 | **CU Boulder APS Friday Lunch Seminar** (Bounder, CO)
Invited talk: *Confirmation of a Discrepancy between Radio and UV–IR Measures of the SFRD*

10/2023 | **TUNA Lunch Talk @ NRAO** Charlottesville, VA)
Invited talk: *Confirmation of a Discrepancy between Radio and UV–IR Measures of the SFRD*

05/2023 | **Radio Lunch Seminar Series @ Caltech** (Pasadena, CA)
Invited talk: *Understanding our Universe through Confusion and Ultra-faint radio galaxies*

05/2023 | **New Eyes on the Universe: SKA & ngVLA** (Vancouver, Canada)
Contributed talk: *Constraints on the SFH of the Universe by Ultra-Faint Galaxies*

03/2023 | **Scientific Frontiers & Synergies for the DSA-2000 Radio Camera** (Pasadena, CA)
Contributed talk: *Towards a Robust Measurement of the Star-Formation History of the Universe*

01/2022 | **DSA-2000 Science Workshop** (Virtual)
Invited talk: *A billion radio galaxies*

11/2021 | **SPARCSX: Capturing Science from the Pathfinder Survey Data** (Virtual)
Contributed talk: *The Cosmic Star-Formation History Measured at 1.4 GHz*

01/2021 | **237th meeting of the American Astronomical Society (Virtual)**
Dissertation talk: *A Radio Continuum Measurement of the Star Formation History of the Universe*

10/2020 | **Virtual Internal Science Series @ NRAO** (Charlottesville, VA)
Invited talk: *P(D) Radio Source Counts and the Star Formation History of the Universe*

10/2020 | **Galaxies & Cosmology, Stars & Planets Seminar @ Harvard-SAO CfA** (Cambridge, MA)
Invited talk: *A Radio Continuum Measurement of the SFH of the Universe*

02/2020 | **Celebrating the Legacy of the Spitzer Space Telescope** (Pasadena, CA)
Contributed talk: *The Dust-unbiased Evolution of Star-Forming Galaxies with Spitzer and Radio*

05/2019 | **IX SPARCS Meeting – Pathfinders Get to Work** (Lisbon, Portugal)
Contributed talk: *nJy Science II: The Star Formation History of the Universe*

07/2018 | **The Formation of Globular Clusters at High and Low Redshifts** (Sexten, Italy)
Contributed talk: *Resolved Star Formation Efficiency in the Antennae Galaxies*

02/2015 | **Meeting of the North American NanoHertz Gravitational Observatory (Arecibo, PR)**
Contributed talk: *Positions and Motions of Millisecond Pulsars*

Observing Campaigns & Experience

XMM-Newton, PI:
PID 096300: 104ks observation of NGC 1532 to search for thermal plasma.

Magellan, PI: , (17.5 total nights)
Techniques used: low-resolution prism spectroscopy, optical/NIR imaging, medium resolution grism spectroscopy, narrowband imaging, integral field spectroscopy
2024B: *Characterizing the Effects of Cosmic-Ray Diffusion in NGC 1532*, 2.5 nights
2024A & 2025A: *Emission line spectroscopy of radio galaxies*, 3 nights
2022A–2023B: *Understanding Star Formation in the Faintest Radio Galaxies*, 12 nights

MeerKAT, PI:
20 hours of high spectral-resolution HI observations of NGC 1532.

CTIO Blanco-4m, PI:
4 nights over semesters 2022A/2022B to obtain deep DECam $ugrizY$ photometry.

Spitzer, Co-I:
PID 14246: 75.6 hours to deeply image the MeerKAT-DEEP2 field at $3.6\ \mu$m and $4.5\ \mu$m.

JVLA, PI:
18B-116: 120 hours to measure radio source counts through the images' confusion distribution.
17B-385: 2 hours of DDT to image four candidate fields for future deep observations to detect the faintest star-forming galaxy population.

JVLA, Co-I:
18A-338: *Co-evolution of Star-forming Galaxies and AGN in the JWST NEP Deep Field*, (2018)
17B-353: *Co-evolution of Star-forming Galaxies and AGN in the JWST NEP Deep Field*, (2017)

VLBA, Co-I:
18B-041: *Extending the Deep-wide VLBA observations of the JWST-NEP Survey Field*, (2018)
17B-364: *Deep-wide VLBA observations of the JWST-NEP Survey Field*, (2017)

ALMA, PI:
2016.1.10023.S: *ALMA's First Look at the Crab Pulsar*, (2016)

Apache Point Observatory (APO) 3.5m Telescope
25 hours of on-site and remote observing with the Dual Imaging Spectrograph to obtain spectroscopic redshifts for a sample of 12 galaxies., (2016-2017)

Arecibo Observatory
15 hours of on-site and remote pulsar observations with the 430 MHz, L-Band, and S-Band receivers., (2014-2015)

Publications

18. **A. M. Matthews**, W. D. Cotton, W. M. Peters, L. Marchetti, T. H. Jarrett, J. J. Condon, J. M. van der Hulst and M. E. Moloko, *A Galactic Scale Magnetized Wind Around a Normal Star-Forming Galaxy*, *ApJL*, 978L, 25M, (2025).
17. C. L. Hale, I. Heywood, M. J. Jarvis, et al. [including **A M. Matthews**], *MIGHTEE: The Continuum Survey Data Release 1*, *MNRAS*, 536, 2187H, (2025).
16. M. E. Moloko, L. Marchetti, T. Jarrett, J J. Condon, W. D. Cotton, **A. M. Matthews**, and T. Mauch, *Probing the Infrared/Radio correlation of the full IRAS Revised Bright Galaxy Sample with MeerKAT and VLA*, in review in *MNRAS*, (2024).
15. **A. M. Matthews**, D. D. Kelson, A. B. Newman, F. Camilo, J. J. Condon, W. Cotton, M. Dickinson, T. H. Jarrett, M. Lacy, *Confirmation of a Substantial Discrepancy in the Star Formation Rate Density at* $0.2 < z < 1.3$, *ApJ*, 966, 194M, (2024).
14. **A. M. Matthews**, R. Mazzei, A. M. McAlister, et al., *Graduate Student Participation in K-12 Science Outreach: Self-reported Impact on Identity and Confidence of STEM Graduate Students*, *Journal of Higher Education Outreach and Engagement*, 26, 3, p57–72, (2022).
13. I. H. Whittam, M. J. Jarvis, C. L. Hale, et al. [24 additional authors including **A. M. Matthews**], *MIGHTEE: the nature of the radio-loud AGN population*, *MNRAS*, 516, 245W, (2022).
12. J. J. Condon, W. D. Cotton, T. Jarrett, L. Marchetti, **A. M. Matthews**, T. Mauch, M. E. Moloko, *A MeerKAT 1.28 GHz Atlas of Southern Sources in the IRAS Revised Bright Galaxy Sample*, *ApJ*, 257, 35C, (2021).
11. **A. M. Matthews**, J. J. Condon, W D. Cotton, T. M. Mauch, *Cosmic Star-Formation History Measured at 1.4 GHz*, *ApJ*, 914, 126, (2021).
10. **A. M. Matthews**, J. J. Condon, W D. Cotton, T. M. Mauch, *Source Counts Spanning Eight Decades of Flux Density at 1.4 GHz*, *ApJ*, 909, 193M, (2021).
9. C.R. Hayes, **A.M. Matthews**, Y. Song, et al., *First results from the Dark Skies, Bright Kids astronomy club draw-a-scientist test*, *Physical Review Physics Education Research*, 16, 010131, (2020).
8. T. Mauch, W. D. Cotton, J. J. Condon, **A. M. Matthews**, et al., *The 1.28 GHz MeerKAT DEEP2 Image*, *ApJ*, 888, 61M, (2020).
7. J. J. Condon, **A. M. Matthews**, Broderick J. J., *Radio Sources in the Nearby Universe*, *ApJ*, 872, 148C, (2019).
6. **A. M. Matthews**, Johnson K. E., Whitmore, B. C., Brogan, C. L., et al., *Resolved Star Formation Efficiency in the Antennae Galaxies*, *ApJ*, 862, 147M, (2018).
5. Condon, J. J. & **A. M. Matthews**, *ΛCDM Cosmology for Astronomers*, *PASP*, 130g, 3001C, (2018).
4. Z. Arzoumanian, et al. [54 additional authors including **A. M. Matthews**], *The NANOGrav 11-year Data Set: High-precision Timing of 45 Millisecond Pulsars*, *ApJS.*, 235, 37A, (2018).
3. W. D. Cotton, J. J. Condon, K. I. Kellermann, M. Lacy, R. A. Perley, **A. M. Matthews**, et al., *The Angular Size Distribution of μJy Radio Sources*, *ApJ*, 856, 67C, (2018).
2. C. R. Hayes et al. [24 additional authors including **A. M. Matthews**], *Disentangling the Galactic Halo with APOGEE. I. Chemical and Kinematical Investigation of Distinct Metal-poor Populations*, *ApJ*, 852, 49H, (2018).
1. **A. M. Matthews**, D. J. Nice, E. Fonseca, Z. Arzoumanian, et al., *The NANOGrav Nine-year Dataset: Astrometric Measurements of 37 Millisecond Pulsars*, *ApJ*, 818, 92M, (2016).