

# EMILY MORAVEC

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## RESEARCH INTERESTS

Active Galactic Nuclei; Radio Galaxies; Galaxy Clusters; Interferometric Imaging

## EDUCATION

**Ph.D. in Astronomy**, University of Florida, Gainesville, FL December 2019

**Dissertation**, *Radio Galaxies in Massive Galaxy Clusters at  $z \sim 1$*

**Advisor:** Dr. Anthony Gonzalez

- Investigated the interplay between radio galaxies and the cluster environment at  $z \sim 1$  using radio, optical, and infrared data.

**Master's of Science in Astronomy**, University of Florida, Gainesville, FL May 2016

**Bachelor of Arts in Physics**, St. Olaf College, Northfield, MN May 2014

Magna Cum Laude, Honors in Physics

## POSITIONS HELD

**Postdoctoral Fellow**, Green Bank Observatory, Green Bank, WV November 2021 - present

**Postdoctoral Fellow**, Astronomical Institute of the Czech Academy of Sciences, Prague, Czech Republic  
February 2020 - October 2021

**ALMA Support Scientist**, Czech ARC Node, Prague, Czech Republic February 2020 - October 2021

**Research Assistant**, University of Florida, Gainesville, FL August 2018 - December 2019

**Graduate Teaching Assistant**, University of Florida, Gainesville, FL August 2015 - May 2016

**Graduate Student Fellow**, University of Florida, Gainesville, FL August 2014 - August 2018

**Undergraduate Researcher**, Maria Mitchell Observatory, Nantucket, MA June 2013 - January 2014

**Undergraduate Researcher**, University of Wisconsin-Madison, Madison, WI May - August 2012

## PEER REVIEWED PUBLICATIONS

### First Author

- Moravec, E. A.** et al., *Do Radio Active Galactic Nuclei Reflect X-ray Binary Spectral States*, 2022, A&A, 662, A28.
- Moravec, E. A.** et al., *The Massive and Distant Clusters of WISE Survey. IX. High Radio-Activity in a Merging Cluster*, 2020, ApJ.
- Moravec, E. A.** et al., *The Massive and Distant Clusters of WISE Survey. VII. The Environments and Properties of Radio Galaxies in Clusters at  $z \sim 1$* , 2020, ApJ, 88, 74.
- Moravec, E. A.** et al., *The Massive and Distant Clusters of WISE Survey. V: Extended Radio Sources in Massive Galaxy Clusters at  $z \sim 1$* , 2019, ApJ, 871, 186.
- Moravec, E. A.** et al., *HST and Ground-based Spectroscopy of Quasar Outflows: From Mini-BALs to BALs*, 2017, MNRAS, 468, 4539.

### Co-Author

- See ORCID page (<https://orcid.org/0000-0001-9793-5416>)

## NOTABLE PUBLICATIONS

- Richards, A., **Moravec, E.**, et al., *Self-calibration and Improving Image Fidelity for ALMA and Other Radio Interferometers*, ALMA Memo No. 620.
- Chao-Hui, F., **Moravec, E.**, Nanut, F., Raducha, T., Reshef, O., Sivakumar, C., Williams, L.A., *The spectrum of early career physics*, Nat. Rev. Phys., 2021, doi: <https://doi.org/10.1038/s42254-021-00379-2>.

- **Moravec, E.**, *A Resource for Creating a Website to Promote Your Scientific Work*, 2020, BAAS, Vol. 52, Iss. 2, ID. 0211.
- Marvil, J. and **Moravec, E.**, *VLA Self-Calibration Tutorial*, October 2020, Karl G. Jansky VLA Tutorials, NRAO CASA Guides
- **Moravec E.**, Czekala I., and Follette K., *The Early Career Perspective on the Coming Decade, Astrophysics Career Paths, and the Decadal Survey*. Astro2020: Decadal Survey on Astronomy and Astrophysics, 2019, APC White Papers, BAAS, Vol. 51, Iss. 7, ID. 8.
- **Moravec, E.**, Nguyen, L. T., and Percher, A., *Training in Policy Memoranda Writing for Early Career Scientists*, 2019, Journal of Science Policy & Governance, Vol. 15, Issue 1.

## PROFESSIONAL ACTIVITY

### Fellowships and Grants

- **American Astronomical Society Doxsey Travel Prize Honorable Mention**, \$265, AAS, January 2020.
- **NASA Florida Space Grant Consortium Dissertation Improvement Fellowship**, ~\$5000, Florida Space Grant Consortium, May 2019 - April 2020
- **Research!America 2019 Microgrant**, \$2500, Research!America, October 2019
- **Science Policy Microgrant**, \$2500, National Science Policy Network, September 2018
- **Christine Mirzayan Science & Technology Policy Graduate Fellowship**, \$9000, National Academies of Sciences, Engineering, and Medicine, January - April 2018
- **Graduate Student Fellowship**, \$100,000, University of Florida, August 2014 - August 2018
- **H3C Initiative Grant**, \$800, Bob Graham Center for Public Service and Student Affairs at the University of Florida, April 2016
- **Travel Grant**, \$350, University of Florida's Graduate Student Council, April 2016, Sept 2017, April 2019
- **Graduate Student Travel Grant**, \$600, College of Liberal Arts and Sciences, University of Florida, April 2016, October 2017, April 2019

### Workshops

- **OPTICON Virtual Archival School** (tutor-Sub-mm Extragalactic group), Online, June 19-26, 2021.
- **SMA Interferometry School** (attendee), Online, March 15-18, 2021.
- **AAS Data Carpentry Workshop** (participant), Online, January, 7-8, 2021.
- **VLA/VLBA Virtual Community Day** (participant), Online, December 15, 2020.
- **Radio/Millimeter Astrophysical Frontiers in the Next Decade Workshop** (participant), Charlottesville, VA, June 2019.
- **Interferometry Imaging Workshop** (co-organizer & presenter), University of Florida, FL, May 30, 2019.
- **Green Bank Telescope Remote Observer Training Workshop** (participant), Green Bank Observatory, WV, Jan 23 -24, 2019.
- **Astro2020 Early Career Focus Session** (organizer and participant), National Academies of Sciences, Engineering, and Medicine, Washington D.C., October 8 - 9, 2018.
- **Science Policy Memo Writing Workshop**, National Science Policy Network, Washington D.C., October 5 - 6, 2018
- **16th Synthesis Imaging Workshop**, NRAO, Socorro, NM, May 16 - 23, 2018
- **6th VLA Data Reduction Workshop**, NRAO, Socorro, NM, October 23 - 27, 2017

- **Astronomy Ambassador Outreach Workshop**, American Astronomical Society, Kissimmee, FL, January 3-4, 2016

### **Seminars and Conference Presentations (last 5 years)**

I have given 17 invited talks, 10 contributed talks, 4 poster presentations, and 3 invited outreach presentations in the last 5 years at institutions such as the Center for Astrophysics, the National Astronomy Radio Observatory, Space Telescope Science Institute and the European Southern Observatory, and at conferences all over the world.

#### **The Radio-AGN Population in Massive Galaxy Clusters and Galaxy Cluster Mergers at $z \sim 1$**

- Contributed talk, European Astronomical Society Annual Meeting 2021, Online, June 2021.

#### **Do Radio Active Galactic Nuclei Reflect X-ray Binary Spectral States?**

- Invited seminar, Astronomical Institute of the Czech Academy of Sciences, Online, March 2022.
- K-poster, European Astronomical Society Annual Meeting 2021, Online, June 2021.
- Contributed talk, 237th American Astronomical Society Meeting, Online, January 2021.
- Contributed talk, Young Astronomers on Galactic Nuclei, Online, October 2020.

#### **Chasing Radio Galaxies Across the Universe**

- Invited seminar, STSci + JPL Galaxies and AGN Journal Club, Online, April 2022.
- Invited seminar, Georgia State University, Online, April 2022.
- Invited seminar, JILA/CU Boulder, Online, March 2021.
- Invited seminar, Naval Research Laboratory, Online, February 2021.

#### **The Effect of Environment on Radio Galaxies at $z \sim 1$**

- Lightning talk, A New Window on the Radio Emission from Galaxies, Clusters, and Cosmic Web Conference, Online, March 2021.
- Invited seminar, Astrophysics Group at Michigan State, Online, November 2020.
- Invited seminar, Galaxy Cluster Group at the Center for Astrophysics, Online, September 2020.
- Dissertation talk, 235th American Astronomical Society Meeting, Honolulu, HI, January 2020.

#### **High Radio Activity in a MaDCoWS Merging Galaxy Cluster**

- Invited Talk, Green Bank Observatory Community Zoom, Online, January 2022.
- Seminar, AAS Journal Author Series Video, September 2020.
- TUNA Talk, NRAO, Online, September 2020.
- Invited Science Lunch Talk, Green Bank Observatory, Online, August 2020.

#### **Radio-Active CoWS: Extended Radio Sources in Massive Clusters at $z \sim 1$**

- Poster, Tracing Cosmic Evolution with Clusters of Galaxies, Sexten, Italy, July 2019.
- Poster & Flash Talk, Are AGN Special? Workshop, Durham, U.K., August 2018.

#### **The Impact of the AAS Astronomy Ambassadors on Astronomy Outreach in Florida**

- Invited talk, Special Session *The AAS Astronomy Ambassadors Program: Past, Present, and Future*, 235th American Astronomical Society Meeting, Honolulu, HI, January 2020.

### **Collaborations and Working Groups**

I am a part of many collaborations that have a membership base ranging from a few to tens that are distributed across the globe. Their goals include studying galaxy clusters, accretion, radio continuum surveys, and helping ALMA users.

- The Massive and Distant Clusters of *WISE* Survey (MaDCoWS)
- Searching for a Holistic Interpretation of Variable Accretion (SHIVA)
- Extended Radio Sources in Clusters (ExtRAC), 3 members in Europe and China
- SKA Pathfinder Radio Continuum Survey (SPARCS) WG on Source Finding and Characterisation
- External collaborator of the Surveys Key Science Project of LOFAR

- External collaborator of Mapping Nearby Galaxies with APO (MaNGA)
- The MeerKAT International GHz Tiered Extragalactic Exploration (MIGHTEE) Continuum WG

## AWARDED OBSERVING TIME

### VLA

- (21B) **Moravec, E.A.** et al., *Radio Active Galactic Nuclei in Merging Galaxy Clusters at  $z \sim 1$* , 12.5 hr (C)
- (20B + 21B) Borkar, A. et al., *Revealing the Elusive Power Source of Green Pea Galaxies*, 19 hr (C), 4.5 hr (C).
- (18A) **Moravec, E.A.** et al. *Radio-Active CoWS: Extended FIRST Sources in MaDCoWS Clusters*, 11.5 hours (B + C)
- (16B + 17B) Gonzalez, A. et al. *Extended FIRST Sources in MaDCoWS Clusters*, 15.5 + 22.3 hours (C).

### GBT

- (19B+ 20A +20B) Brodwin, M. et al. MUSTANG-2 Observations of the Highest-Richness MaDCoWS Clusters at  $0.8 < z < 1.6$ , 60 (A) + 63 (A) + 105 (B)

### SMA

- (22A + 21B + 21A) **Moravec, E.A.** et al., *Investigating Radio Active Galactic Nuclei and Their Host Galaxies in Merging Galaxy Clusters at  $z \sim 1$* , 2 B tracks

## SCIENTIFIC AND TECHNICAL EXPERTISE

### • Observing Experience

**JVLA** — Created scheduling blocks for continuum observations for 5 projects (L-band, C-band, X-band; A and B configurations), imaged over 50 datasets

**GBT** — 2 weeks in-situ observational training, 35+ hours of observing experience with MUSTANG2, certified remote observer

- **Documentation:** co-author of VLA Self-Calibration Tutorial, creation of personal website guide, contributor to GBT MUSTANG2 observer's guide, code documentation, academic paper writing
- **Interferometry:** radio interferometric calibration and imaging, particularly self-calibration and wide-field, high-dynamic range imaging using multi-frequency-synthesis; multi-frequency datasets
- **Data Familiarity:** JVLA, radio morphology catalogs, LoTSS, XMM SUSS, 4XMM-DR9, Swift UVOT SSC, Swift 2SXPS, Spitzer, PanSTARRS, DECaLS, HST COS spectra, MDM CCDS spectra, SDSS & BOSS spectra, WIYN IFU spectra (300 - 1000 nm), SNIFS IFU spectra from 2.2m telescope of University of Hawaii (400 - 1000 nm), Gemini GMOS Images
- **Astronomical Languages/Software:** CASA, DS9, IRAF/PyRAF, IDL, Topcat
- **Programming Languages/Software:** Python, Unix CLI/Bash, LaTeX, Git, C++, Jekyll

## RELATED PROFESSIONAL EXPERIENCE

### **Mirzayan Science and Technology Policy Fellow; Independent Consultant; Presentation Team**

National Academies of Sciences, Engineering, and Medicine, Washington D.C. April 2018 - present

- Main visionary and event coordinator for a 2-day Early Career Focus Session which educated and included early career astronomers and astrophysicists in the planning and input process of the astronomy and astrophysics decadal survey.
- Responsible for writing white paper concerning discussion at focus session and presenting to decadal survey panel.

**Co-Founder of Emerging Leaders in Science Policy and Advocacy**

University of Florida, Gainesville, Florida

May 2018 - December 2019

Co-president: 2018-2019, Secretary: 2019

- Co-founded a student-led, diverse organization of scientists that strives to initiate informed discussions about science policy and participate in advocacy for evidence-based policy.

**Congressional Visits Day Volunteer**

March 2016

American Astronomical Society, Washington D.C.

- Trained for and met with Members of Congress to raise visibility and support for science, engineering, and technology.

**ASTRONOMY OUTREACH****UF Astro Outreach Team**

August 2014 - present

University of Florida, Gainesville, FL

- Design and coordinate community educational events and workshops in collaboration with various local institutions.
- January 2016: Officially co-founded team with the mission to create impactful outreach events and fulfill outreach requests.

**Co-Founder of Springs & Stars Initiative**

April 2016 - April 2017

University of Florida, Gainesville, FL

- Co-recipient of the University of Florida's Bob Graham Center H3C Initiative Grant.
- Execute 3 educational star gazing event in 3 Florida State Parks in order to bridge the gap between education hubs, underserved rural areas, and Florida's public parks.