TYLER COX

Github: https://github.com/tacox5

EDUCATION

B.S. in Astrophysics & B.S. in Physics December 2019
Arizona State University
Cumulative GPA: 3.68
Major GPA: 3.97 (Astrophysics), 3.63 (Physics)
Thesis: *Cross-Correlation between HERA and SPHEREx*

RESEARCH EXPERIENCE

Cross-Correlation Between HERA and SPHEREx Jan. 2019 – Present
Arizona State University *Tempe, AZ*

- Estimated the feasibility of studying the Epoch of Reionization using the 21 cm-Lyα cross-power spectrum as measured by the intensity mapping experiments, the Hydrogen Epoch of Reionization Array (HERA), and SPHEREx
- Advisors: Drs. **Daniel Jacobs**, **Judd Bowman**, and **Alexander van Engelen**

Target Scheduling for the MeerKAT Commensal SETI Search Jun. 2019 – Aug. 2019
University of California, Berkeley *Berkeley, CA*

- Developed a pipeline to select targets for Breakthrough Listen's commensal survey with the MeerKAT Radio Telescope. Will be used to observe 1 million stars in the southern hemisphere for technosignatures
- Resulted in two poster presentations
- Advisors: Dr. **Daniel Czech** and **David MacMahon**

Estimating HERA's System Temperature Aug. 2018 – May 2019
Arizona State University *Tempe, AZ*

- Estimated the frequency-dependent system temperature of HERA by fitting auto-correlation data to a simulated global sky model for first two seasons of HERA observations
- Resulted in an internal collaboration memo, poster presentation, and talk
- Advisor: Dr. Daniel Jacobs

Mapping HERA's Primary Beam w/ Extragalactic Radio Sources May – Aug. 2018
Arizona State University *Tempe, AZ*

- Developed an image processing pipeline to image full nights of HERA data.
- Measured HERA's primary beam using extragalactic radio sources to constrain CST models.
- Resulted in an internal collaboration memo, American Astronomical Society conference poster, and Chambliss Award
- Advisors: Drs. **Adam Beardsley** and Daniel Jacobs

Sustainable Community Modeling w/ SIMOC Jun. 2017 – Feb. 2018
Arizona State University *Tempe, AZ*

- Used agent-based modeling to implement the foundational, numerical model of SIMOC, a Scalable Model of an Isolated, Off-World Community
- Advisors: **Kai Staats** and Drs. Daniel Jacobs and Judd Bowman

OUTREACH EXPERIENCE

Planetarium Presenter Oct. 2015 – Present
Marston Exploration Theater *Tempe, AZ*

- Developed and presented a variety of 3D planetarium shows on various topics ranging from geology to cosmology for the general public, researchers visiting ASU, and K-12 students

Guest Speaker May 2017, May 2019
Estrella Foothills H.S and Dobson H.S. *Multiple Locations*

- Spoke to high school groups about the field of astronomy and current research being done in cosmology

HERA Crash Course Assistant Instructor Feb. 2019
Arizona State University *Tempe, AZ*

- Assisted in teaching and organizing a week-long crash course in radio interferometry for 17 undergraduate and graduate students at ASU

Planetarium Volunteer Nov. 2018 – Jan. 2019
Mesa Community College Planetarium *Mesa, AZ*

- Organized and assisted with physics demonstrations for the general public during Mesa Community Colleges monthly Astronomy Nights

PUBLICATIONS/MEMOS

[1] *Ghelot, B., Jacobs, D.,* **Cox, T.**, *Bechtel, S.,* "Revisiting Receiver Temperature Measurements Using Auto-Correlations", HERA Internal Collaboration Memo, May 2019

[2] **Cox, T.**, "Mapping HERAs Primary Beam Using Extragalactic Point Sources", HERA Internal Collaboration Memo, Aug. 2018

TALKS/POSTERS

235th American Astronomical Society Meeting Jan. 2020
Target Scheduling for the MeerKAT Commensal SETI Search *Honolulu, HI*

Undergraduate Research Symposium, Poster Apr. 2019
Target Scheduling for the MeerKAT Commensal SETI Search *Berkeley, CA*

28th Annual Arizona/NASA Undergraduate Research Symposium, Talk Apr. 2019
Estimating HERA's System Temperature *Tempe, AZ*

ASU/NASA Space Grant Poster Session, Poster Feb. 2019
Estimating HERA's System Temperature *Tempe, AZ*

233rd American Astronomical Society Meeting, Poster Jan. 2019
Mapping HERA's Primary Beam Using Extragalactic Radio Sources *Seattle, WA*

HERA Annual Meeting 2018, Poster Nov. 2018
Mapping HERA's Primary Beam Using Extragalactic Radio Sources *Tempe, AZ*

AWARDS

Chambliss Astronomy Student Achievement Award Jan. 2019
No financial award

- Award given to recognize exemplary undergraduate research at 233rd Meeting of the American Astronomical Society

ASU Undergraduate Student Government Travel Award Oct. 2018, 2019
$500

- Funding for travel to the 233rd and 235th Meetings of the American Astronomical Society

ASU/NASA Space Grant Undergraduate Fellowship Aug. 2018
$3,200

- Funding provided to undergraduates to conduct research and increase engagement of underrepresented minorities in STEM

New American University Scholarship Aug. 2015
$32,000

- Merit-based scholarship given to incoming ASU freshmen who display strong academic potential

TECHNICAL SKILLS

Computer Languages	Python (4 years), C/C++ (2 years), Java (1 year), Bash (3 years)
Packages	Numpy, Scipy, Pandas, Scikit-Learn, Tensorflow
Astronomical Software	CASA, Astropy
Tools	Git, MySQL, LaTeX