

ERIN GUILFOIL COX

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CURRENT POSITION

Postdoctoral Associate August 2018 – present
Northwestern University, Center for Interdisciplinary Exploration and Research in Astrophysics

EDUCATION

University of Illinois Urbana-Champaign, IL
Ph.D. in Astronomy July 2018

University of Arizona Tucson, AZ
B.S. in Astronomy & Physics May 2012

AWARDS & GRANTS

Rodger Doxsey Travel Prize, 2018, American Astronomical Society: Travel and Registration assistance for the 231st Meeting

Excellence Award in Recognition of Academic Excellence, Good Citizenship and Service, 2015 – 2018, University of Illinois at Urbana-Champaign

SOFIA Cycle 5 GO Grant, 2016, SOFIA Science Mission Operations: \$7,000 to work on approved proposal, *Mapping the Intermediate-Scale Magnetic Field Around IRAS4A and Nearby Protostars*

ALMA Student Observing Support, 2016, National Radio Astronomical Observatory. One year of graduate funding

SOFIA Cycle 4 GO Grant, 2015, SOFIA Science Mission Operations: \$13,000 to work on approved proposal, *Mapping the Intermediate-Scale Magnetic Field Around IRAS4A and Nearby Protostars*

Illinois Space Grant, 2015, Illinois Space Grant Consortium: \$10,000 fellowship

Excellent Teacher Award, 2014, University of Illinois at Urbana-Champaign

RESEARCH EXPERIENCE

University of Illinois Astronomy Department May 2014 – July 2018
Prof. Leslie Looney

- Investigating the evolved protoplanetary disk population in ρ Ophiuchus using ALMA Band 7 continuum observations.
- Probing compact emission from paramagnetic molecules in Class 0 sources using ALMA observations.
- Imaged the binary population of protostars in Perseus with Gemini to identify migration patterns.
- Tying together multi-wavelength and multi-scale polarization observations from ALMA, VLA and SOFIA, of the youngest (Class 0 and Class I) protostars.

University of Illinois Astronomy Department January 2014 – January 2015
Prof. You-Hua Chu

- Examined the shock boundaries of wind-blown bubbles surrounding Wolf-Rayet stars using *HST* spectral observations.

University of Arizona Astronomy Department June 2012 – August 2013
Research Specialist

- Responsible for data reduction and archival for tests performed during cryogenic testing of NIRCam (a Near Infrared Camera on JWST).
- Created new codes to refine data reduction to a more streamlined and organized process.
- Enhanced existing scripts to more efficiently and effectively reduce data from tests on HIRG detectors.

National Solar Observatory

May 2010 – August 2012

Dr. Matt Penn

- Reduced IR solar spectra of CO taken from the McMath Pierce telescope on Kitt Peak.
- Wrote IDL code to produce velocity and temperature maps from pressure modes.
- Used Fourier and Wavelet analysis on these maps to further understand the solar atmosphere.

University of Arizona Astronomy Department

September 2011 – November 2012

Prof. Lucy Zuirys

- Mapped the $J = 1 \rightarrow 0$ transition temperature of HCO^+ in the Dumbbell Nebula.
- Wrote IDL code for data analysis.

University of Arizona Astronomy Department

May 2011 – November 2011

Dr. Serena Kim

- Classification of YSOs within the Gum Nebula using archival *Spitzer/WISE* and optical data.
- Used archival c2d data to fit for temperatures for IR excesses for ~ 30 objects.

REFEREED PUBLICATIONS

9. *ALMA Observations of Polarized 872 μm Dust Emission from the Protostellar Systems VLA1623 and L1527*
Harris, Robert J.; **Cox, Erin G.**; Looney, Leslie W.; Li, Zhi-Yun; Yang, Haifeng; et al.
The Astrophysical Journal, Volume 861, Issue 2 (2018)
8. *ALMA's Polarized View of 10 Protostars in the Perseus Molecular Cloud*
Cox, Erin G.; Harris, Robert J.; Looney, Leslie W.; Li, Zhi-Yun; Yang, Haifeng; et al.
The Astrophysical Journal, Volume 855, Issue 2 (2018)
7. *Protoplanetary Disks in ρ Ophiuchus as Seen From ALMA*
Cox, Erin G.; Harris, Robert J.; Looney, Leslie W.; Chiang, Hsin-Fang; Chandler, Claire; et al.
The Astrophysical Journal, Volume 851, Issue 2 (2017)
6. *Disc polarization from both emission and scattering of magnetically aligned grains: the case of NGC 1333 IRAS 4A1*
Yang, Haifeng; Li, Zhi-Yun; Looney, Leslie W.; **Cox, Erin G.**; Tobin, John; Stephens, Ian W.; Segura-Cox, Dominique M.; Harris, Robert J.
Monthly Notices of the Royal Astronomical Society, Volume 460, Issue 4 (2016)
5. *High-resolution 8 mm and 1 cm Polarization of IRAS 4A from the VLA Nascent Disk and Multiplicity (VANDAM) Survey*
Cox, Erin G.; Harris, Robert J.; Looney, Leslie W.; Segura-Cox, Dominique M., et al.
The Astrophysical Journal Letters, Volume 814, Issue 2 (2015)
4. *Time-monitoring observations of Br γ emission from young stars*
Eisner, J. A.; Rieke, G. H.; Rieke, M. J.; Flaherty, K. M.; Stone, J. M.; Arnold, T. J.; Cortes, S. R.; **Cox, E.**; Hawkins, C.; Cole, A.; Zajac, S.; Rudolph, A. L.
Monthly Notices of the Royal Astronomical Society, Volume 447, Issue 1 (2014)
3. *Millimeter Observations of CS, HCO+, and CO toward Five Planetary Nebulae: Following Molecular Abundances with Nebular Age*

- Edwards, J. L.; **Cox, E. G.**; Ziurys, L. M.
The Astrophysical Journal, Volume 791, Issue 2 (2014).
2. *Time-monitoring observations of the ro-vibrational overtone CO bands in young stars*
Eisner, J. A.; Rieke, G. H.; Rieke, M. J.; Flaherty, K. M.; Arnold, T. J.; Stone, Jordan M.; Cortes, S. R.; **Cox, E.**; Hawkins, C.; Cole, A.; Zajac, S.; Rudolph, A. L.
Monthly Notices of the Royal Astronomical Society, Volume 434, Issue 1 (2013)
 1. *Probing the Solar Atmosphere Using Oscillations of Infrared CO Spectral Lines*
Penn, M. J.; Schad, T.; **Cox, E.**
The Astrophysical Journal, Volume 734, Issue 1 (2011).

SUCCESSFUL PI PROPOSALS

Can polarization tell us anything about magnetic fields around young protostars?, 2018, Project: 2018.1.00827.S, Atacama Large Millimeter/submillimeter Array (**ALMA**)

Mapping the Intermediate-Scale Magnetic Field Around IRAS4A and Nearby Protostars, 2016, Project: 05_0035, Stratospheric Observatory for Infrared Astronomy (**SOFIA**)

Laying the groundwork for future ALMA direct magnetic field detection, 2016, Project: 2016.1.01245.S, **ALMA**

Looking for a Keplerian disk in the very young protostar IRAS 4A, 2016, Project: 2016.1.00369.S, **ALMA**

Characterizing the Youngest Multiplicity Systems in the Perseus Molecular Cloud, 2016, Project: 2016B-0207, **Gemini**

A New Probe of Protostellar Magnetic Fields Using Centimeter-Wave Polarization, 2016, Project: 16A-322, Very Large Array (**VLA**)

Mapping the Intermediate-Scale Magnetic Field Around IRAS4A and Nearby Protostars, 2015, Project: 04.0177, **SOFIA**

Testing the Correlation of Class 0 Disks with Aligned Magnetic Field and Rotation Axes, 2015, Project: 2015.1.01503.S, **ALMA**

Polarization Dust Observations of the Class 0 Keplerian Disk in L1527, 2015, Project: 15A-412, **VLA**

OBSERVING EXPERIENCE

East Asian Observatory (JCMT), 2017: Completed 5 nights observations on various sources, including deciding which projects to observe (queued scheduling), assessing weather quality, and reducing data on-the-fly for quality control

CARMA Summer School, 2014: Received training in radio interferometry data reduction, analysis techniques, and how to operate the CARMA telescope array. Designed and observed first radio observing project.

Arizona Radio Observatory, 2011–2012: Carried out multiple (20+ days) of observing HCO⁺ in the Dumbbell Nebula. Assessed weather conditions, and data quality remotely.

Bok Telescope, 2010: Conducted 3 nights of spectral observations on variable stars.

EXTERNAL TALKS

The Multi-Scale Magnetic Field of Iras4a,

2018, Magnetic Fields or Turbulence: Which is the critical factor for the formation of stars and planetary disks?

Probing Protoplanetary Disks: From Birth to Protoplanets,

2018, 231st Meeting of the American Astronomical Society

Laying the groundwork for future ALMA direct magnetic field detection in protostellar environments,

2017, 71st International Symposium on Molecular Spectroscopy

Filamentary Structure of Serpens Main and Serpens South Seen in N_2H^+ , HCO^+ , and HCN ,

2016, 70th International Symposium on Molecular Spectroscopy

Magnetic Field Morphology at Disk Sized Scales,

2016, Star Formation, Magnetic Fields, and Diffuse Matter in the Galaxy Meeting

SERVICE & OUTREACH

Physics Slam VII

November 2018

Fermilab

- Gave an invited public lecture to 900 people.

CUWiP Programming Committee Co-Chair

August 2018 – Present

Northwestern University

- Planned conference panel topics and aided in organizing logistics.
- Lead in finding panel speakers for conference.

Outreach in the Champaign-Urbana Community

2015 – 2018

- Demonstrated and ran exhibits for both children and adults for a science-themed farmer's market booth.
- Planned and demonstrated astronomy related activities to elementary school students through the Urbana after school program.
- Assisted in hands-on astronomy activities aimed at young (ages 2 – 11) children at the Champaign Public Library.
- Aided with astronomy activities during a summer school program Science, Technology, Engineering, Art, and Mathematics (STEAM), for elementary aged students.

2017 Eclipse Viewing in Goreville, IL

2017

- Helped coordinate logistics for total eclipse viewing, planned hands-on activities for the public, and gave preparation talks to elementary schools.

Astronomy Camp

2017

University of Illinois Astronomy Department

- Aided in advanced logistics for planning two day camp for high school girls, organized led research, and presented imaging workshop.

American Astronomical Society Astronomy Ambassadors Workshop

2016

227th Meeting of the American Astronomical Society

- Received formal outreach training for early career astronomers to better communication with students and public.

Girls Explore Astronomy Summer Camp

2016

Champaign Park District with the Astronomy Department

- Helped organize and implement activities for a week-long astronomy camp for middle school aged girls.

Girls Engaged in Math and Science (GEMS)

2015

National Center for Supercomputing Applications

- Aided with demonstrations of astronomical research during a week-long camp for middle school girls.

TEACHING EXPERIENCE

Teaching Assistant

Killer Skies guest lecture, Fall 2017

Stars and Galaxies guest lecture, Spring 2017

Stars and Galaxies, Fall 2013, Spring 2014

Stars and Galaxies Lab, Fall 2014

Planets and Solar System Lab, Fall 2014