Janik Karoly
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Education

Jeremiah Horrocks Institute, University of Central Lancashire, Preston UK — Sep. 2020 – Present
Astronomy and Astrophysics PhD in Observational Star Formation
Moses Holden Fellow

B.S. Santa Clara University (SCU), Santa Clara, CA (**GPA: 3.90**) — Sep. 2016 – June 2020
College of Arts and Sciences:
Physics Major (**GPA: 3.96**), Political Science Minor
SCU Honors Program Graduate

Reed College, Portland, OR — Aug. 2015 – May 2016
Reed Young Scholars Program
Physics Major (GPA: 3.70)

Research Experience

Santa Clara University Department of Physics — June 2018 – Sep. 2018
Mentor: Dr. Guy Ramon
Calculating Cumulants for Noise Spectroscopy with Qubits

- Investigated environmental noise for qubits using cumulant expansions
- Used *Mathematica* to find general equations to calculate cumulants for control pulses of any sequence and length
- Coded equations on *MATLAB* so that cumulants can be calculated for unique sequences

NASA Ames Research Center, SOFIA Science Center — June 2019 – Sep. 2020
Mentors: Dr. B-G Andersson, Dr. Archana Soam
Studying the magnetic field in thr starless core L183 — June 2019 – Sep. 2019

- Reduced sub-millimeter polarimetry observations from JCMT using *Starlink* software
- Used *Python* to analyze reduced data
- Calculated magnetic field strength to investigate role of magnetic field in star formation

Determining excitation temperature across ridge in IC63 — June 2020 – Sep. 2020

- Worked with reduced SOFIA/EXES observations of pure-rotational H_2 transitions
- Created H_2 excitation diagrams to determine temperatures in the IC 63 PDR across a ridge
- Mentored undergraduate students in their research projects

Member of the BISTRO (**B**-Fields **I**n **ST**ar-Forming **R**egion **O**bservations) large program at the James Clerk Maxwell Telescope

Publications

- **Karoly, J.,** Ward-Thompson, D., Pattle, K., BISTRO Consortium. *The JCMT BISTRO Survey: Studying the Complex Magnetic Field of L43*. 2023, ApJ, Submitted.
- Andersson, B-G., **Karoly, J.,** Bastien, P.**,** et al. *Sub-mm wavelength Polarimetry of IRC+10216*. 2023, ApJ, Submitted.

- Bonne, L., Andersson, B-G., Minchin, R., et al. *High Resolution Observations of HI in the IC 63 Reflection Nebula.* 2023, ApJ, Accepted, doi: 10.48550/arXiv.2304.13669
- Ward-Thompson, D., **Karoly, J.,** Pattle, K., BISTRO Consortium. *First BISTRO Observations of the Dark Cloud Taurus L1495A: The Role of the Magnetic Field in the Earliest Stages of low-mass Star Formation.* 2023, ApJ, 946, 62.
- Soam, A., Andersson, B-G., **Karoly, J.**, et al. *Spatial variation in temperature and density in the IC 63 PDR from H2H2 Spectroscopy.* 2021, ApJ, 923, 107S.
- **Karoly, J.**, Soam, A., Andersson, B-G., et al. *Revisiting the Magnetic Field of the L183 Starless Core*. 2020, ApJ, 900, 181K.
- **Karoly, J.**, *Measurements of magnetic field structure and strength in a starless core L183*. iPoster session at: 235th American Astronomical Society meeting, Jan 4-8th 2020; Honolulu, HI.

Additional Posters and Talks

- Poster at **National Astronomical Meeting**, Warwick UK, July 2022. *First results from BISTRO-3: The Complex Magnetic Field in L43*
- Seminar at **Eddington Astronomical Society**, Kendal UK, January 2023. *Observations of intragalactic magnetic fields across spatial scales in the early stages of star formation*
- Seminar at the **James Clerk Maxwell Telescope/East Asian Observatory**, September 2022. *An Overview of BISTRO Science and a Look Ahead at BISTRO-3*
- Talk at the **SOFIA School 2022**: Understanding mid and far-IR data, February 04, 2022. *A Rotational Ladder in IC63*
- Recorded talk at the **SOFIA Science Center Workshop**: Magnetic Fields and the Structure of the Filamentary Interstellar Medium, June 2021. *Multi-wavelength analysis of the magnetic field in rho Ophiuchus A using SOFIA/HAWC+ and BISTRO/POL-2*
- Seminar at the **SOFIA Science Center/NASA Ames**, September 2019. *Sub-parsec-scale measurement of magnetic field structure and strength in a starless core L183*

Honors and Awards

- Phi Beta Kappa, Sigma Pi Sigma and Sigma Xi member
- John B. Drahmann Prize (Santa Clara University)
    - "awarded to the graduating physics major who exemplifies the hard-working and earnest values of John B. Drahmann, longtime dean of sciences and professor of physics."
- Santa Clara University Distinguished Student Award (January 2017)
- Academic Deans' List (2018-19 Academic Year)
- Fox Fellowship Recipient (Summer 2018 & 2019)
    - Physics Department undergraduate research funding award

Employment

- University of Central Lancashire Sep. 2020 – Present
    - **Grader** for various undergraduate Physics and Astrophysics modules
    - **Lab tutor** for 1st year physics labs (4 hrs/week)
    - **Lab tutor** for 3rd year physics lab (3 hrs/week)
    - **Astronomy outreach worker** at Alston Observatory

- Santa Clara Physics Department Apr. 2018 – June 2020
    - **Graded** homework each quarter for one or two introductory physics classes (class sizes: 40-60 students; 3-6 hours per week)
    - **Led review sessions** for first year students before final exams for introductory physics classes (8 hours each quarter)

- Santa Clara University Drahmann Tutoring Center Sep. 2018 – June 2020
    - **Tutored** students in physics both individually (appointment format) and ran drop-in tutoring sessions for large groups of students (6-12 hours per week)

Skills

- Proficiency in Python, MATLAB, Mathematica and LaTeX with some experience in C++
- Participated in 50+ undergraduate lab experiments using various mechanical and electrical lab equipment