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Job Positions

Postdoctoral Research Associate (Supervisor: Dr. Kate Pattle) *Apr. 2024 – Present*
University College London, London UK

Education

Jeremiah Horrocks Institute, University of Central Lancashire, Preston UK *Sep. 2020 – Mar. 2024*
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 course (GPA: 3.70)

Invited Talks

- Invited speaker at the **International Symposium on Cosmic Magnetic Fields** in Beijing, China (NAOC), 2025 October 12-16
- Invited colloquium speaker at the Argentine Institute of Radio Astronomy, Buenos Aires, Argentina, 2025 March 31. *Submillimeter Dust Polarimetry: Illuminating the Magnetic Fields in our Galaxy – from Low-mass Molecular Clouds to the Galactic Center*.
- Invited speaker at the MPIfR Science with the Atacama Pathfinder Experiment, Ringberg Castle, Tegernsee, Germany, 2025 January 19-22. *A New MKID Continuum Camera with Polarization Capabilities for the JCMT*

Selected Publication List

- Yang, M-Z., Lai, S-P., **Karoly, J.**, et al. *The JCMT BISTRO Survey: Unveiling the Magnetic Fields around Galactic Center.* 2025, ApJ, Accepted, arXiv:2503.05198.
- **Karoly, J.,** Ward-Thompson, D., Pattle, K., BISTRO Consortium. *The JCMT BISTRO Survey: Magnetic Fields Align with Orbital Structure in the Galactic Center.* 2025, ApJL, 982, 22.
- Gupta, S., Soam, A., Karoly, J., et al. *Magnetic fields on different spatial scales of the L328 cloud*. 2025, MNRAS, Accepted, arXiv:2412.19701.
- Pattle, K., Barry, P. S., Blain, A. W., et al. *The UK Submillimetre and Millimetre Astronomy Roadmap 2024.* 2024, submitted to STFC, arXiv:2408.12975.
- Li, S., Bintley, D., Ho, P.T.P., et al. *Current progress of the new sub-millimeter survey instrument at JCMT: an upgrade to SCUBA-2/POL-2 with 7272 MKIDs detectors at 850 μm*. 2024, in Bryant J. J., Motohara K., Vernet J. R. D., eds, Proc. SPIE Vol. 13096, https://doi.org/10.1117/12.3018648.
- Andersson, B-G., **Karoly, J.,** Bastien, P., et al. *Submillimeter-wavelength Polarimetry of IRC+10216*. 2024, ApJ, 963, 76.
- **Karoly, J.,** Ward-Thompson, D., Pattle, K., BISTRO Consortium. *The JCMT BISTRO Survey: Studying the Complex Magnetic Field of L43*. 2023, ApJ, 952, 29.

- Bonne, L., Andersson, B-G., Minchin, R., et al. *High Resolution Observations of HI in the IC 63 Reflection Nebula.* 2023, AJ, 165, 243.
- Ward-Thompson, D., **Karoly, J.,** Pattle, K., and the 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, 181.

Telescope and General Astronomy Experience

- **Member of BISTRO** (**B**-Fields **I**n **ST**ar-Forming **R**egion **O**bservations) large program at the JCMT
- **Lead** of the Galactic Center Team within BISTRO (20+ members)
- **Member of MagMaR** (Magnetic Fields in Massive Star-forming Regions) ALMA survey
- **Member of ACES** (ALMA CMZ Exploration Survey)
- Member of the team **developing the next-generation MKID camera** on JCMT
- Visited the James Clerk Maxwell Telescope (JCMT) as a **guest observer**
- **Submitted 5 proposals** to JCMT as PI that have been accepted and awarded telescope time
- Participated in the **scientific evaluation of JCMT proposals** as requested by the JCMT TAC
- **Submitted proposals** to ALMA as PI
- **Reviewed and graded** ALMA proposals as part of their peer-review process
- **Awarded** SALT time from part of guaranteed telescope time at UCLan
- **Proficient** with SOFIA/HAWC+ and EXES, *Planck*, *Herschel*, JCMT and ALMA data

Supervisor Roles:

- Supervised a high school student during a summer research project at UCL as part of the Astro-Shift25 initiative (Summer 2024)
- Second supervisor to MSc students at UCL (2024/25)

General Posters and Talks

- Talk at **Armagh Galactic Star Formation Workshop**, Armagh, Northern Ireland, September 2024. The JCMT/BISTRO Sub-millimetre Magnetic Field of the Galactic Centre
- Talk at **National Astronomical Meeting**, Hull, England, July 2024. The JCMT/BISTRO Sub-millimetre Magnetic Field of the Galactic Centre.
- Talk at **Royal Astronomical Society Meeting: New Eyes on the Cold Universe**, London, UK, November 2023. JCMT's Continued Contribution to Investigating Star Formation with BISTRO-3
- Talk at **National Astronomical Meeting**, Cardiff, Wales, July 2023. The Magnetic Field across a Stellar Evolutionary Gradient in an Isolated Filament.
- Poster at **National Astronomical Meeting**, Cardiff, Wales, July 2023. Unveiling the Cloud-Scale Magnetic Field of the Galactic Center
- Talk at **JCMT Users Meeting**, Universities College London, June 2023. Preliminary Results from BISTRO-3: Observing Magnetic Fields along Size and Age Scales
- 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**, Hawaii, USA, 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**, California, USA, September 2019. *Sub-parsec-scale measurement of magnetic field structure and strength in a starless core L183*

Funding Awards

- UKRI Research England QR funding at UCLan - £2400 for outreach at Alston Observatory

Astronomy Schools

- Attended two ALMA Science Workshops in the UK
- Attended the 2nd NCTS International Astronomy Winter School on Magnetism in Star-forming and Galactic Environments in Taipei, Taiwan
- Attended the 2024 European Radio Interferometry School (ERIS) in Granada

Previous Research Experience

NASA Ames Research Center, SOFIA Science Center *June 2019 – Sep. 2020*
(Mentors: Dr. B-G Andersson, Dr. Archana Soam)

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

Studying the magnetic field in the 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

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

Honors and Awards

- Phi Beta Kappa, Sigma Pi Sigma and Sigma Xi honor societies 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

- Universities Space Research Association *June 2020 – Sep. 2020*
    - 3-month contract to continue previous work and start new projects (see above)

- University of Lancashire *Sep. 2020 – Present*
    - **Grader** for various undergraduate Physics and Astrophysics modules
    - **Lab tutor** for 1st year physics labs (4 hrs/week)
    - **Lab instructor** 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** undergraduate students in physics individually (1-on-1, appointment format) and ran drop-in tutoring sessions for large groups of students (6-12 hours per week)

General Skills

- Proficiency in Python, MATLAB, Mathematica and LaTeX with some experience in C++ and Mathcad
- Participated in 50+ undergraduate lab experiments using various mechanical and electrical lab equipment
- Delivered 10+ science talks to students aged 5-16 as part of the outreach program at UCLan
- Organized the summer postgraduate seminar series for two years at UCLan