I. L. Garland

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Research Interests

Galaxy Formation and Evolution • Active Galactic Nuclei • Merger-Free Processes • Galaxy Morphology • Citizen Science • Science Outreach and EDI

Transferable Skills

Spectral Data Reduction • Multi-wavelength Analysis of Complex Samples

Education

2019 - present Ph.D., Lancaster University. Expected completion 2024. Supervisor: Dr. B. D. Simmons
2015 - 2019 MPhys., Lancaster University (first class) Supervisor: Dr. B. D. Simmons

Grants & Scholarships

2016 Lancaster University Academic Scholarship awarded £2,000 as a one-off payment to students who obtained *A*A*A* at A-Level.
2016-2019 Lancaster University Access Scholarship awarded £1,000 each academic year to underrepresented students who obtained *A*AA* at A-Level and maintained a high academic standard in subsequent years.

Research Projects

May 2019 MPhys Thesis "Fuelling AGN in the Local Universe"
I compared a sample of disk-dominated galaxies to a sample of elliptical galaxies, then divided the disk sample into barred and non-barred galaxies to examine how effectively each category can fuel AGN.
May 2018 Third Year Group Project "An Exploration into the Expansion of the Universe"
We investigated the role of dark energy in the expansion of the Universe following the ΛCDM model, and determined how well future telescopes could further scientific exploration into this concept.

Observing Experience

Nov 2018 Two nights (remotely) on the Kast Double Spectrograph (Shane-3m Telescope, Lick Observatory). Later completed the data reduction for these observations alongside the remainder of the multi-year Lick campaign.
May 2022 Four nights (on-site) on the Wide-Field Camera (INT, ING Observatory)

Teaching

2019 - 2023 Post-Graduate Teaching Assistant, including practical lab demonstrating, and marking

Outreach and Service

2019 - present LUniverse Planetarium presenter, delivering both virtual and in-person planetarium shows to Key Stage 2 (KS2; age 7 -11) children in the local area
2019 - present Student Ambassador, delivering activities designed to allow KS2 children to develop an interest in physics
2020-2022 Seminar Coordinator for Observational Astrophysics Group
2023 NAM 2023 Session Convenor "AGN Demographics and Evolution in the Era of Large-Scale Surveys"; "LGBTQ+ Lunch Networking Session"

Scientific Communication

Jan 2019 Durham-Edinburgh eXtragalactic Conference, "AGN fuelling in the merger-free regime", *Talk*

Jun 2021 European Astronomical Society, Virtual Conference "Bar-driven fuelling as a means of merger-free supermassive black hole growth", *Poster*

Jul 2021 National Astronomy Meeting, Virtual Conference, title as for EAS, *Poster*

May 2022 AGNXIV Conference, "AGN Fuelling in the Merger-Free Regime", *Poster*
"Secular Black Hole Growth, AGN Feedback, and Galaxy Co-evolution", *Talk*

Jan 2023 Durham-Edinburgh eXtragalactic Conference, "AGN and Bar Presence", *Talk*

Mar 2023 St. Andrew's Lunch Seminar, "Merger-free co-evolution of black holes and galaxies", *Seminar*

Broader Skill Development

2016 - present Girlguiding Volunteer. *Responsibilities include: district commissioner, safely running units with a balanced and varied programme, financial organisation, coordinating my unit leadership team* (Adult Leadership Qualification)*, planning and leading day trips and residential experiences* (Going Away with Guiding License)*, mentoring other adult members, co-ordinating our local district and representing at higher levels, and assisting all members in achieving their full potential. Demonstrates commitment over an extended period of time, people and project management, responsibility, involvement in the wider community.*

Peer-Reviewed Publications

8. "Galaxy Zoo DESI: Detailed morphology measurements for 8.7M Galaxies in the DESI Legacy Imaging Surveys" M. Walmsley, T. Géron, S. Kruk, A. M. M. Scaife, C. Lintott, K. L. Masters, J. M. Dawson, H. Dickinson, L. Fortson, **I. L. Garland**, et al., MNRAS, accepted July 2023.
7. "The most luminous, merger-free AGNs show only marginal correlation with bar presence" **I. L. Garland**, et al., 2023, MNRAS, 522(1), 211.
6. "Supermassive black holes in merger-free galaxies have higher spins which are preferentially aligned with their host galaxy**"** R. S. Beckmann, R. J. Smethurst, B. D. Simmons, A. Coil, Y. Dubois, **I. L. Garland**, et al., 2023, MNRAS, arXiv:2211.13614.
5. "Harnessing the Hubble Space Telescope Archives: A Catalogue of 21,927 Interacting Galaxies" D. O'Ryan, B. Merín, B. Simmons, A. Vojteková, A. Anku, M. Walmsley, **I. Garland**, et al., 2023, ApJ, 948(1), 40.
4. "Evidence for non-merger co-evolution of galaxies and their supermassive black holes" R. J. Smethurst, R. S. Beckman, B. D. Simmons, A. Coil, J. Devriendt, Y. Dubois, **I. L. Garland**, et al., 2023, MNRAS, arXiv:2211.13677.
3. "Gems of the Galaxy Zoos - a Wide-Ranging Hubble Space Telescope Gap-Filler Program" W. C. Keel, J. Tate, O. I. Wong, J. K. Banfield, C. J. Lintott, K. L. Masters, B. D. Simmons, C. Scarlata, C. Cardamone, R. J. Smethurst, L. Fortson, J. Shanahan, S. Kruk, **I. L. Garland**, C. Hancock, D. O'Ryan, 2022, ApJ, 163(4), 150.
2. "Quantifying the Poor Purity and Completeness of Morphological Samples Selected by Galaxy Colour**"** R.J. Smethurst, K. L. Masters, B.D. Simmons, **I. L. Garland**, et al., 2022, MNRAS 510(3), 4126.

1. “Kiloparsec-scale AGN outflows and feedback in merger-free galaxies” R. J. Smethurst, B. D. Simmons, A. Coil, C. J. Lintott, K. L. Masters, E. Glikman, G. C. K. Leung, J. Shanahan, **I. L. Garland**, 2021, MNRAS, 507(3), 3985.