

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

Collaborations

Galaxy Zoo

Technical Skills

Spectral Data Reduction • Multi-wavelength Analysis of Complex Samples • Photometric Analysis

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.

Jun 2023 **Graduate College Travel Bursary** awarded £150 to contribute to travel costs for attending conferences.
2016-2019 **Lancaster University Access Scholarship** awarded £1,000 each academic year to underrepresented students who obtained A^*A^* at A-Level and maintained a high academic standard in subsequent years.
Feb 2016 **Lancaster University Academic Scholarship** awarded £2,000 as a one-off payment to students who obtained A^*A^*A at A-Level.

Research Projects

In Progress **PhD Thesis** “Uncovering the Link Between AGN and Large-Scale Galactic Bars”
I analyse disk-dominated galaxies that host AGN and large-scale galactic bars to examine any relationship present, using facilities such as the Kast Double Spectrograph, and catalogues such as the DESI Legacy Surveys.
May 2019 **MPhys Thesis** “Fuelling AGN in the Local Universe”
I compare a sample of disk-dominated galaxies to a sample of elliptical galaxies, then divide the disk sample into barred and non-barred galaxies to examine how effectively each category can fuel AGN.
May 2018 **Bachelor's Project** “An Exploration into the Expansion of the Universe”
We investigate the role of dark energy in the expansion of the Universe following the Λ CDM model, and determine how well future telescopes could further scientific exploration into this concept.

Observing Experience

Oct 2023 — Three nights (on-site) with **Intermediate Dispersion Spectrograph** (INT, ING Observatory).
May 2022 Four nights (on-site) with **Wide-Field Camera** (INT, ING Observatory)
Nov 2018 Two nights (remotely) with **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.

Teaching

- 2023 Private Tutor, Physics A-Level
2019 - 2023 Post Graduate Teaching Assistant, including practical lab demonstrating, and marking
2021 - 2023 Co-supervision of MPhys Students, including M. Silcock, L. Potts

Outreach and Service

- Jul 2023 National Astronomy Meeting Session Convenor “AGN Demographics and Evolution in the Era of Large-Scale Surveys”; “LGBTQ+ Lunch Networking Session”, *Conference Sessions*
2020-2022 Seminar Coordinator for Observational Astrophysics Group
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

Scientific Communication

- Sep 2023 ICE-CSIC, Barcelona, Spain, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Sep 2023 University of Innsbruck, Austria, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Sep 2023 University of Zurich, Switzerland, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Sep 2023 INAF-Arcetri, Florence, Italy, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Sep 2023 INAF-OAS, Bologna, Italy, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Aug 2023 University of Groningen, The Netherlands, “Merger free co-evolution of black holes and galaxies”, *Seminar*
Mar 2023 University of St. Andrew’s, UK, “Merger-free co-evolution of black holes and galaxies”, *Seminar*
Jan 2023 Durham-Edinburgh eXtragalactic Conference, Edinburgh, UK, “AGN and Bar Presence”, *Talk*
May 2022 AGNXIV Conference, Florence, Italy, “AGN Fuelling in the Merger-Free Regime”, *Poster*
“Secular Black Hole Growth, AGN Feedback, and Galaxy Co-evolution”, *Talk*
Jul 2021 National Astronomy Meeting, Virtual Conference, “Bar-driven fuelling as a means of merger-free supermassive black hole growth”, *Poster*
Jun 2021 European Astronomical Society, Virtual Conference, “Bar-driven fuelling as a means of merger-free supermassive black hole growth”, *Poster*
Jan 2019 Durham-Edinburgh eXtragalactic Conference, Durham, UK, “AGN fuelling in the merger-free regime”, *Talk*

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. Geron, S. Kruk, A. M. M. Scaife, C. Lintott, K. L. Masters, J. M. Dawson, H. Dickinson, L. Fortson, **I. L. Garland**, et al., 2023, MNRAS, arXiv:2309.11425
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.