

Ryan Lambert

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EDUCATION

- Indiana University** Bloomington, IN
Ph.D. in Astronomy (Minor in Physics) December 2021
- Thesis: Searching for Substructure in the Stellar Populations of Dwarf and Giant Galaxies (Advisors: Katherine Rhode and Enrico Vesperini)
- Appalachian State University** Boone, NC
B.S. in Physics with a concentration in Astronomy (Minor in Mathematics) 2015
- Thesis: The Use of Ca I and H γ in Determining Stellar Activity (Advisors: Richard Gray and Dale Wheeler)
 - Distinctions: Graduated with Honors

RESEARCH EXPERIENCE

- Postdoctoral Research:** Planetary Defense with the Unistellar Citizen Science Network 2022 –Present
Advisor: Franck Marchis
- Refine the orbit and shape of asteroids using data obtained through the Unistellar citizen science network. Regularly update the planetary defense pipeline with new features and bug fixes using Python. Detect transit events of binary asteroids using the lightcurve obtained from the Unistellar network. Develop new pipelines to efficiently calculate and distribute ephemerides to citizen scientists when a potential asteroid needs confirmation.
- PhD Dissertation Research:** Searching for Substructure in the Stellar Populations of Dwarf and Giant Galaxies 2015 –2021
Advisors: Katherine Rhode and Enrico Vesperini
- Analyzed the spatial distributions of astronomical sources (globular cluster candidates around the elliptical galaxies M84 and M86, and Red Giant Branch stars in M31 dwarf satellite galaxies) to search for evidence of major mergers or accretion events. Writing Python scripts to estimate the surface density of objects using kernel density estimation, estimating structural parameters of galaxies through maximum likelihood estimation, and calculating residual differences between expected surface density values and measured values.
- Undergraduate Research:** The Young Stellar Analogs Project 2011 –2015
Advisor: Richard Gray
- Performed spectroscopy and photometry of 31 young, Sun-like stars. Reduced and analyzed data from the Dark Sky Observatory 0.8m to understand the sample's star-spot cycles and make inferences about Earth's space environment during the early history of the Solar System.
- Undergraduate Thesis:** The Use of Ca I and H γ in Determining Stellar Activity 2014 –2015
Advisors: Richard Gray and Dale Wheeler
- As an offshoot of the Young Solar Analogs Project, I used our collection of spectra for the 31 solar analogs to probe the correlation of the Ca I and H γ spectral lines to stellar activity.

SKILLS AND TRAINING

- **Programming languages and environments:** Python, Unix, C, IRAF, R
- **Software:** Github, L^AT_EX, Overleaf, Microsoft Office, Adobe Photoshop
- **Participant: Summer School in Statistics for Astronomers XIV** May 2018
Participated in a weeklong workshop on statistical techniques and software for astronomical research. Topics covered include: Bootstrap resampling, Bayesian inference, spatial statistics, and model selection. The workshop included tutorials within the R environment.
- **Dark Sky Observatory 0.8m Telescope (Appalachian State University)** 2013 –2015
 - Observed 4-6 nights a semester during the academic year, and 10 nights each summer. Collected data for undergraduate research and thesis.
- **Kirkwood 12-inch Refracting Telescope (Indiana University)** 2015 –Present
 - Used to observe stars, planets and the moon, during Kirkwood Observatory Open House nights. Taught the operation of the telescope for undergraduate majors course (A305: Modern Observational Techniques).

TEACHING EXPERIENCE

- Instructor of Record** *The Solar System (A100)* Summer 2019
Indiana University
- A 30-student online course designed for non-majors. Duties included designing the online course lectures, assignments, and final project as well as grading the material and holding regular office hours for students.
- Instructor of Record** *The Art of Astronomy (A107)* Summer 2018
Indiana University
- A 60-student online course designed to teach the basics of astrophotography to non-majors. Duties included designing and implementing the entirety of the online course and holding regular office hours for students.
- Instructor of Record** *Stars and Galaxies (A105)* Summer 2017
Indiana University
- A 30-student introductory course for non-majors and majors. Duties included 1 hour and 15 minute daily lectures and the creation, administration, and grading of all course content, such as quizzes, homework assignments, midterms, final exams, classroom demonstrations, and lecture material.
- Associate Instructor** *Modern Observational Techniques (A305)* Fall 2015, 2017, 2019
Indiana University
- A 30-student, high-level astronomy course for majors. The course was designed to teach proper technique for observing with large telescopes and reducing data with IRAF software. Responsibilities included grading exams and homework, teaching labs, and acting as a tutor for students.
- Associate Instructor** *Various Courses (A100, A107, A105)* 2016 –2019
Indiana University
- Assisted with various introductory astronomy courses for non-majors. Duties included grading assignments, holding office hours, running help sessions, administering exams, and attending all class meetings.

ASTRONOMY OUTREACH EXPERIENCE

- **Astronomy Outreach Coordinator for the IU Astronomy Department** Fall 2020, Spring 2021
Manager for department outreach events. Responsibilities include acting as a point of contact for the public, maintaining the department twitter page, and coordinating event volunteers.
- **Volunteer for Wonderlab: After Dark** July 2019

An annual event held at the Wonderlab Science Museum designed to engage adults. I operated one of the department's 8 inch Celestron telescopes so the attendees could view Saturn and Mars.

- **Volunteer for Wonderlab Astronomy Day** April 2018
An event for small children (0-8 years of age) held at the Wonderlab Science Museum. I set up and ran a crater making activity booth and assisted with the set up of a booth for viewing a galileoscope and handling meteorites.
- **Astronomy Club Graduate Student Liaison** 2018 –2021
Provide a bridge between the undergraduate officers of the local Astronomy club and the Astronomy department. Duties include providing food, preparing the department telescopes for use, and managing club requests.
- **Volunteer for Indiana University Science Fest** 2015–2021
Science Fest aims to engage children from the elementary to the high school level with fun, educational activities that relate to different fields of science. I ran different activities through out the day, such as making comets, thermal imaging demonstrations, and drawing scale models of the solar system.
- **Volunteer at Kirkwood Observatory Open House** 2015 –2021
The Kirkwood Observatory is an on-campus observatory that is no longer in use for scientific research. Every week the observatory is opened to the public with graduate students operating the telescope and answering questions.

HONORS AND AWARDS

- Frank and Margaret Edmondson Prize for Teaching Spring 2018
- Winner of the Undergraduate Student Research Competition for Appalachian State Research Day 2013

PROFESSIONAL AFFILIATIONS

American Astronomical Society 2015 –Present

PUBLICATIONS

- [1] R. A. Lambert, K. L. Rhode, and E. Vesperini, “Substructure in the Globular Cluster Populations of the Virgo Cluster Elliptical Galaxies M84 and M86”, *The Astrophysical Journal*, vol. 900, no. 1, p. 45, Sep. 2020. arXiv: 2008.01737 [astro-ph.GA].
- [2] R. O. Gray, J. M. Saken, C. J. Corbally, M. M. Briley, R. A. Lambert, V. A. Fuller, I. M. Newsome, M. F. Seeds, and Y. Kahvaz, “The Young Solar Analogs Project. I. Spectroscopic and Photometric Methods and Multi-year Timescale Spectroscopic Results”, *The Astronomical Journal*, vol. 150, no. 6, p. 203, Dec. 2015. arXiv: 1511.00279 [astro-ph.SR].

CONFERENCE PRESENTATIONS

American Astronomical Society Kentucky Area Meeting (Lexington, KY) May 2020
Substructure in the Globular Cluster Populations of the Virgo Cluster Elliptical Galaxies M84 and M86 Poster

American Physical Society March Meeting (Denver, CO) March 2014
The Young Solar Analogs Project Poster

Quadrennial Physics Congress (Orlando, FL) November 2012
The Evolution of the Superstar Technique and Its Use In the Young Solar Analogs Project Poster