

PHILOSOPHY DEPARTMENT & UC CENTER FOR CENTER FOR PUBLIC ENGAGEMENT WITH  
SCIENCE  
ARTS & SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2024

PROJECT TITLE: Developing Astronomy Ring Galaxy Catalogues & Outreach

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### Project Description

This project involves assisting in developing, curating, and publishing an extensive collisional ring galaxy catalogue containing over 2,000 newly classified ring and ring-like astronomical objects. This catalogue serves as observational evidence for an ongoing interdisciplinary research project of on dark matter. Cosmological models predict that 25% of the universe is composed of dark matter. In addition to not knowing what dark matter is, there is no clear understanding of where most of it resides. Our group is attempting to find some of this missing dark matter. Our guiding empirical hypothesis is that at least some of the missing dark matter is in dark galaxies—galaxies that are composed entirely of dark matter. These dark galaxies have no visible matter, either because they lost it early on, or they never acquired it in the first place. We believe collisional ring galaxies provide evidence of the existence of dark galaxies. This project is housed in Dr. Melissa Jacquart's Astrophysics and Philosophy Interdisciplinary Teaching, Engagement, and Research Lab (J\*PITER Lab). This lab consists of UC undergrad and graduate students and partners with astrophysicists as well as citizen scientists.

Student will use Gmail, Excel, Lightroom, and Aladin Sky Atlas to assist Dr. Melissa Jacquart with data processing and cataloging of objects for publication. Prior experience with astronomy and computer application systems is helpful but not a disqualifier, as student will be trained in applications and cataloging methodology. Additionally, depending on interests, the applicant may have the opportunity to develop public outreach and engagement activities around astronomy and science locally in Cincinnati and remotely with the Galapagos Islands. Student will gain experience with large-scale data processing and management, working with a team of interdisciplinary researchers, and, depending on interest and success of the project, experience preparing astronomical research for publication and co-authorship;

as well as training in public engagement about science.