7. Please describe your research in a few works (max 2000 characters).

My current research is focused on galaxy evolution in the context galaxy interaction and merging. ΛCDM stipulates that galaxies formed and evolved hierarchically, meaning galaxy interaction is fundamental to galaxy evolution. To investigate the effects of interaction, I utilise Bayesian statistics, machine learning and restricted N-body simulations. I use machine learning (ML) in order to identify interacting systems. This was most notably done in my first published paper, where I used a ML and ESA Datalabs to identify 21,926 interacting galaxies throughout the science archives. I have taken a leading role in attempting to solve the limitations of finding interacting galaxies with ML algorithms.

My PhD has been focused on developing software to analyze this catalogue. Using an efficient restricted N-body simulation and Bayesian Statistics, I am able constrain their interaction history. These constraints will lead into insights in the role interaction is playing in evolution.

I am exploring the interacting systems identified using the COSMOS catalogue. I have cross matched my identified interacting galaxy catalogue with COSMOS to begin to investigate the interplay between a number of physical processes and their photometric parameters.

I am also keenly interested in the low surface brightness (LSB) regime. I am an active member of the LSST collaboration, having partaken in analyzing mock data of LSB features and preparing algorithms for LSST’s initial data releases. I have hosted a summer student investigating the stellar stream about NGC 5907.

Finally, I am an active member of the Galaxy Zoo collaboration, focused on the archived Galaxy Zoo: Mergers project. However, I have also contributed to numerous other projects such as finding objects of astrophysical interest, linking the interplay between galactic bars and nuclear activity and the limitations of using galactic colour as a proxy for galactic morphology.