Level of the project:
Masters

Name of primary supervisor:
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Institution of supervisor:
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Name of co-supervisor:
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Project title:
A potential triple supermassive blackhole in a massive galaxy cluster at z = 0.83

Description:
We have obtained very long baseline interferometry (VLBI) radio observations of a massive galaxy cluster at z = 0.83 during 2025. Hubble Space Telescope observations of this system show that the brightest cluster galaxy (BCG; which we have named "The Mess" as it shows long tidal tails due to a recent merging event) contains three bright blue blobs with a maximum separation of 5 kpc. These could be either clumps of intense star formation, or radiating supermassive blackholes - i.e., a rare, triple active galactic nucleus (AGN). The goal of this project is to decide which, after processing the VLBI data. If we detect three unresolved radio point sources in The Mess, this would be strong evidence of a triple AGN. If we do not, this would favour the star forming clumps explanation. Either way, this is a very interesting and rare object, for which we also expect to obtain MUSE data later this year. The student will be expected to process the VLBI data (most likely with CASA) and interpret the results, and combine this where necessary with the other multi-wavelength data available for this system. We hope that this would lead to a short publication describing the results.