



## James Webb Space Telescope and the most luminous galaxies.

- Probing the evolution of galaxies via the most extreme examples
- Using JWST data to reveal the motions of gas and stars within
- Comparing with data from cutting-edge telescopes at other wavelengths.

<b>Level</b>	PhD
<b>First Supervisor</b>	Prof Andrew Blain <a href="mailto:ab520@leicester.ac.uk">ab520@leicester.ac.uk</a>
<b>Second Supervisor</b>	Dr John Pye
<b>Application Closing Date</b>	20 <sup>th</sup> January 2023
<b>PhD Start date</b>	September 2023

### Project Details:

Based on the ability of new tools like JWST, launched right at the end of 2021, and ALMA, in service at the spectacular Chajnantor site in Chile, we can now peer into the most obscured regions of the Universe, and into the most remarkably powerful objects to investigate their supermassive blackholes and the explosive formation of stars.

We are entering an unprecedented era where we can dissect the processes taking place in forming galaxies in detail that was previously impossible. This is only possible because of new powerful instruments, of which JWST (launched late in 2021) is currently the most exciting, as it is just starting work. Our targets are selected from the WISE all-sky infrared survey – originally designed to provide background information for Webb, and which has been used to discover the most luminous galaxies of all time. Probing inside the most luminous galaxies to understand their triggers and their influence on their surroundings will be the goal. The relative roles of supermassive blackhole accretion and powerful star formation will be probed, and the results compared with data that we have from Guaranteed Time Webb programmes with second-supervisor John Pye.

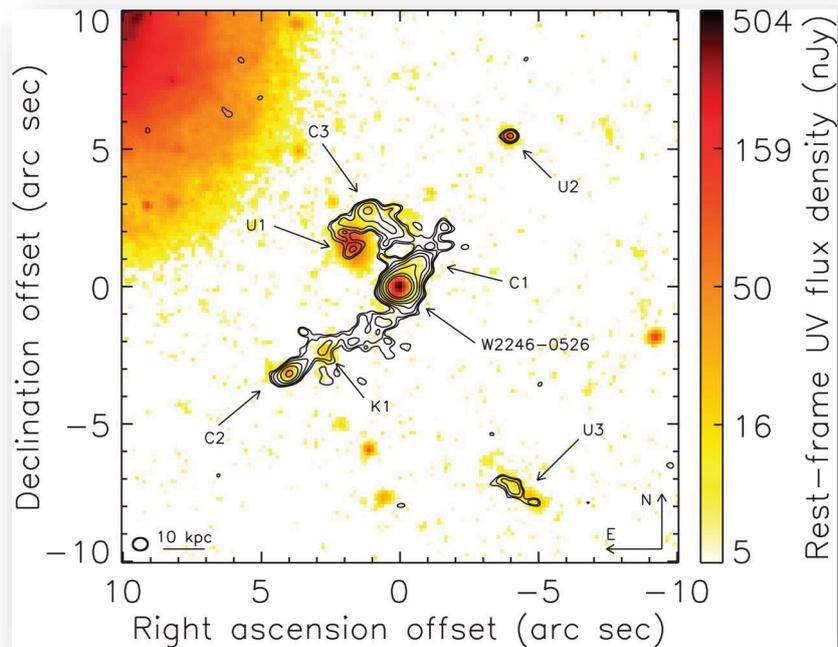
With an international team, a PhD student will work on understanding the processes driving the extreme activity in the most luminous galaxies in the Universe.

Activities that will be involved: extracting information from data from cutting edge telescopes, proposing new observations, and putting the objects in the context of the wider landscape of the formation of galaxies.

Interest in astrophysics, and readiness to ask important new questions are the required skills. Data analysis will be involved, modelling and theoretical work is also possible.



An artist's impression of the most luminous galaxy in the Universe, which is being studied with ALMA and JWST (see Fig 2). [Credit: NASA/Caltech/JPL].



The internal structure of WISE W2246, highlighting rich structure in both ALMA and Hubble Space Telescope images (Science, 2018). [Credit: Science].

## References:

- <https://arxiv.org/abs/1008.0031>
- [https://www.nasa.gov/mission\\_pages/WISE/multimedia/pia15815.html](https://www.nasa.gov/mission_pages/WISE/multimedia/pia15815.html)
- <https://www.eso.org/public/news/eso1602/>
- <https://www.thenakedscientists.com/articles/science-news/cannibal-galaxy-eats-its-neighbours>
- <https://www.almaobservatory.org/en/press-releases/trans-galactic-streamers-feeding-most-luminous-galaxy-in-the-universe/>

## How to apply:

Include with your application:-

- CV
- Degree Certificates and Transcripts
- Details of any study currently being undertaken
- Personal statement
- Enter the supervisor name and project title in the Proposal Section (no proposal required)
- Enter contact details of two academic referees in the boxes provided or upload reference letters if already obtained.
- Evidence of English language if applicable.
- In the funding section include: Ref Blain - UKRI (STFC)

The University of Leicester School of Physics and Astronomy has advertised a number of PhD opportunities. If you are applying for more than one University of Leicester project, please indicate if this is your first, second or third choice, in your application.

Further information on how to apply and funding can be found [here](#)