

Project on AGN feedback and AGN driven outflows

Please take a look at my presentation of mine

https://drive.google.com/file/d/1pmzu5XUR_irQ07ZRSBzhi20Xp6yIIKJ6/view?usp=sharing

to have an overview of galaxy quenching and (negative) feedback phenomena.

The following presentation is more specifically focussed on galactic outflows (both AGN and SF driven)

<https://drive.google.com/file/d/1iuCXIK26a41aeoE5D0mEEZwAECAG6w4n/view?usp=sharing>

Then, still about (cold) outflows, I have co-written the following review, which my may glance at:

<https://ui.adsabs.harvard.edu/abs/2020A%26ARv..28....2V/abstract>

ALMA observing projects

- Project aimed at obtaining deep observation and sensitive to extended emission of the [CII] 158 μ m line (tracing atomic gas), the CO(5-6) emission (tracing molecular gas) and the \sim 100 GHz continuum (which can trace the S-Z effect, i.e. hot gas) of the most luminous quasar at $z > 6$

The goal is to trace cold (atomic and molecular) quasar-driven outflows, the hot halo and extended cold gas in the circumgalactic medium.

You can find the proposal with more description here:

https://drive.google.com/file/d/1ezLea0O0wZMi_PmXxWbmUB47LWH4AWbY/view?usp=sharing

- Project aimed at obtaining deep observation and sensitive to extended emission of the CO(3-2) line (tracing molecular gas) and the \sim 100 GHz continuum (which can trace the S-Z effect, i.e. hot gas) in a sample of 9 quasars at $z \sim 2.5$.
The goal is to trace molecular quasar-driven outflows, the hot halo and extended cold gas in the circumgalactic medium (same as above but at $z \sim 2.5$)

You can find the proposal with more description here:

<https://drive.google.com/file/d/1rdYDIbvpP8zuTdTgmP3kzZjF0qftF5vW/view?usp=sharing>

- Project aimed at obtaining deep observation and sensitive to extended emission of the CO(3-2) line (tracing molecular gas) and the \sim 100 GHz continuum (which can trace the S-Z effect, i.e. hot gas) in a very luminous quasar at $z \sim 1.5$.
The goal is to trace molecular quasar-driven outflows, the hot halo and extended cold gas in the circumgalactic medium (same as above but at $z \sim 1.5$)

You can find the proposal with more description here:

<https://drive.google.com/file/d/1bvzMfHJdWiUuOvayj-g-3x1F4TkmwtnH/view?usp=sharing>

Potential project goals, outline and timeline

Each of the individual programmes can result into a paper (cold outflow, S-Z [i.e. hot halo] and cold gas in the CGM) so potentially 9 papers (although some of them might be grouped together)

If you are interested in these then you should first

- study the principle of interferometry (we can provide reading material for this)
- familiarise with millimetre observations and spectroscopy (we can provide reading material for this)
- familiarise ALMA and its data processing (you would receive tutorial on this by Gareth Jones, who would obviously assist you also for the data processing and analysis for the rest of the project)

Although these are exciting projects, one potential problem is the timeline:

- we have some observations that have already been obtained (and which could serve as a training set)
- the bulk of the data will be obtained between January and March