



Contribution ID : 56

Type : **Poster**

Probing the Physical State of Warm Gas in NGC 4696: Infrared Diagnostics for the JWST Era

Wednesday, 28 October 2026 14:18 (1)

How do supermassive black holes (SMBHs) regulate the growth of the most massive galaxies? The cycle of gas cooling and AGN feedback is central to this question, yet the physical state of the “warm” multiphase gas often remains elusive. In this talk, I present JWST/NIRSpec IFU observations of the inner 640 pc of NGC 4696, the prototypical BCG of the Centaurus cluster. These data reveal dozens of atomic and molecular emission lines, including a rich set of H₂ rovibrational transitions that trace spatial variations in excitation mechanisms at unprecedented resolution. Using Cloudy simulations, I develop new infrared diagnostics, analogous to optical BPT diagrams, optimized for JWST observations.

These results provide new insights into the physical state and excitation of warm gas in massive galaxies and demonstrate the broader potential of JWST spectroscopy for probing feedback, cooling, and star–black hole coupling across different environments. This work highlights Canada’s significant role in JWST science and its contribution to advancing infrared galaxy evolution research, fostering pride in our scientific community.

Did you give a contributed talk at CASCA 2026?

Yes

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

PhD

Which keyword describes the area of focus of this talk?

Galaxies

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Session Classification : Galaxies