

Nuclear Dynamics of a Nearby Seyfert with NIRSpec Integral Field Spectroscopy

Scientific Category: Massive Black Holes And Their Host Galaxies

Scientific Keywords: AGN Host Galaxies, Low-Luminosity AGN/Seyferts, Supermassive Black Holes

Instruments: NIRSPEC

Proprietary Period: 0 months

Allocation Information (in hours):

Science Time: 1.5

Charged Time: 8.5

Abstract

Integral field spectroscopy has become an invaluable tool for investigating the physical conditions and dynamics deep inside galaxy nuclei. The integral field spectrograph on JWST provides some crucial advantages over those on AO-assisted ground-based telescopes like Gemini and VLT. In particular, JWST will provide a stable and diffraction-limited point spread function (PSF) with no seeing halo, and the background will be significantly reduced resulting in shorter exposure times to achieve a benchmark signal-to-noise ratio, even for late-type galaxies that have shallower central cusps and fainter central surface brightnesses, and for which the exposure times required from the ground may be prohibitive. We are particularly interested in comparing black hole masses derived from the modeling of nuclear stellar dynamics to masses derived from reverberation mapping in the same galaxies. With this Early Release Science proposal, we request a small investment of time to clearly demonstrate JWST's capabilities in spatial and spectral resolution relative to the stringent technical requirements for direct black hole mass measurements. The technically demanding nature of the requisite measurements will allow us to explore the limits of what is possible to achieve with the NIRSpec IFU, thus providing technical guidance for a wide range of studies that seek to probe the physics of black hole feeding and feedback and their links to galaxy and black hole co-evolution.

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