

TEMPLATES: Targeting Extremely Magnified Panchromatic Lensed Arcs and Their Extended Star formation

Scientific Category: Galaxies and the IGM

Scientific Keywords: Dust, Emission-Line Galaxies, Galaxy Formation and Evolution, IR-Luminous Galaxies, Starburst Galaxies

Instruments: NIRSPEC, MIRI, NIRCAM

Proprietary Period: 0 months

Allocation Information (in hours):

Science Time: 26.0

Charged Time: 50.1

Abstract

We propose high signal-to-noise NIRSpec and MIRI IFU spectroscopy, with accompanying imaging, for 4 gravitationally lensed galaxies at $1 < z < 4$. This program will spatially resolve the star formation in galaxies across the peak of cosmic star formation, in an extinction-robust manner. Lensing magnification pushes JWST to the highest spatial resolutions possible at these redshifts, to map the key spectral diagnostics of star formation and dust extinction: H-alpha, Pa-alpha, and 3.3um PAH within individual distant galaxies. Our targets are among the brightest, best-characterized lensed systems known, and span a wide range of specific star formation rate, extinction, and luminosity. They have extensive ancillary datasets. Our science goals are:

- 1) demonstrate extinction-robust star formation rate diagnostics for distant galaxies;
- 2) determine the physical scales of star formation in distant galaxies, in an extinction-robust way;
- 3) measure specific star formation rates and compare the spatial distribution of the young and old stars;
- 4) and measure the physical conditions of star formation and their spatial variation.

This program uses key instrument modes, heavily exercising the NIRSpec and MIRI IFUs. The resulting science-enabling data products will demonstrate JWST's capabilities and provide the extragalactic science community with rich datasets. In four deliveries, we will provide high-quality Level 3 data cubes and mosaics, empirical star formation diagnostics, maps of star formation, extinction, and physical properties, a tool for comparing NIRSpec and MIRI data cubes, and cookbooks on data reduction, analysis, and calibration strategy. Co-PI: J. Vieira

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Investigators:

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