Q-3D: Imaging Spectroscopy of Quasar Hosts with JWST Analyzed with a Powerful New PSF Decomposition and Spectral Analysis Package

Scientific Category:	Massive Black Holes And Their Host Galaxies
Scientific Keywords:	AGN Host Galaxies, Emission Lines, Feedback, High-Luminosity AGN/Quasars, Winds and Outflows
Alternate Category:	Galaxies and the IGM
Instruments:	NIRSPEC, MIRI
Proprietary Period:	0 months
Allocation Information (in hours):	
Science Time:	17.4
Charged Time:	27.6

Abstract

In the last few years, optical and near-IR IFU observations from the ground have revolutionized extragalactic astronomy. The unprecedented infrared sensitivity, spatial resolution, and spectral coverage of the JWST IFUs will ensure high demand from the community. For a wide range of extragalactic phenomena (e.g. quasars, starbursts, supernovae, gamma ray bursts, tidal disruption events) and beyond (e.g. nebulae, debris disks around bright stars), PSF contamination will be an issue when studying the underlying extended emission. We propose to provide the community with a PSF decomposition and spectral analysis package for high dynamic range JWST IFU observations allowing the user to create science-ready maps of relevant spectral features. Luminous quasars, with their bright central source (quasar) and extended emission (host galaxy), are excellent test cases for this software. Quasars are also of high scientific interest in their own right as they are widely considered to be the main driver in regulating massive galaxy growth. JWST will revolutionize our understanding of black hole-galaxy co-evolution by allowing us to probe the stellar, gas, and dust components of nearby and distant galaxies, spatially and spectrally. We propose to use the IFU capabilities of NIRSpec and MIRI to study the impact of three carefully selected luminous quasars on their hosts. Our program will provide (1) a scientific dataset of broad interest that will serve as a pathfinder for JWST science investigations in IFU mode and (2) a powerful new data analysis tool that will enable frontier science for a wide swath of astrophysical research. PI: D. Wylezalek, Co-PI: S. Veilleux, N. Zakamska

Investigators:

	Investigator	Institution	Country
	J Barrera-Ballesteros	The Johns Hopkins University	USA/MD
*	N Luetzgendorf	Space Telescope Science Institute - ESA	USA/MD
*	N Nesvadba	Institut d'Astrophysique Spatiale	FRA
	D Rupke	Rhodes College	USA/TN
	A Sun	The Johns Hopkins University	USA/MD
	S Veilleux	University of Maryland	USA/MD
*	D Wylezalek	European Southern Observatory - Germany	DEU
	N Zakamska	The Johns Hopkins University	USA/MD

Number of investigators: 8

* ESA investigators: 3