Scientific Justification

Exploring the Red Sequence of AGN with the *James Webb Space Telescope*

Things We Know About AGN/Quasars::

- Blue Quasars are in enhanced distrubed systems at $z \sim 0.7$ (Villforth et al.)
- "Red" quasars generally merger at $z \sim 2.5$ (Glikman et al. 2016), but "red" here is a somewhat red+radio definition...
- Peak of optical QLF at $z \sim 2 - 3$ (Richards et al. 2006; Ross et al. 2014)
- There is a trend of radio fraction in QSOs with $(g - i)$ colour; the redder the colour, the larger the radio fraction (Klindt et al. 2018)

Things We *don't* Know About AGN/Quasars::

- The host properties of SDSS/BOSS $z = 2 - 3$ QSOs
- Is there a *range* in red quasar host properites??
- Is there a *"transition colour"* above which mergers are enhanced?
- Is there a *transitional Radio Loudness* above which mergers are enhanced?

General Idea::
NIRCam Imaging, and/or NIRSpec spectroscopy (Long Slit? IFU?) of a sample of "red" to "extremely red" quasars.

- What are the host galaxy morphologies of Red Quasars?
- Are "Red" quasars more distrubed than "Extremely Red" quasars?
- Are red radio-loud quasars in different hosts than red radio-quiet quasars??
- Are the narrow lines offset from the broadlines in the red quasars?
- *What physical properties (SFR, morphology disturbanace, radio fraction, outflow etc.) change along the AGN Red Sequence??*

General Sample::
X-Shooter Red Quasar Sample (Radio Loud? Radio Quiet? TBD...)
"Core" ERQs from Hamann et al. (2017). i-W3 selected, with C IVEW selection too.
Select the subset of "core" ERQs that are still r-W4 objects...??
"Hot DOGs" (aka W1W2-drops)

Questions to answer/things to address::

- Why not *HST*?? Want to go redder than e.g. F160W (H-Short at 1.545μm, FWHM=0.29μm
- Why not *ALMA*?? Will/can use ALMA for e.g. SFRs instead of MIRI.

"Cool Ideas...."

- Hopkins (2008) Figure 1, for real, for the Red objects, at $z \approx 2.5$.

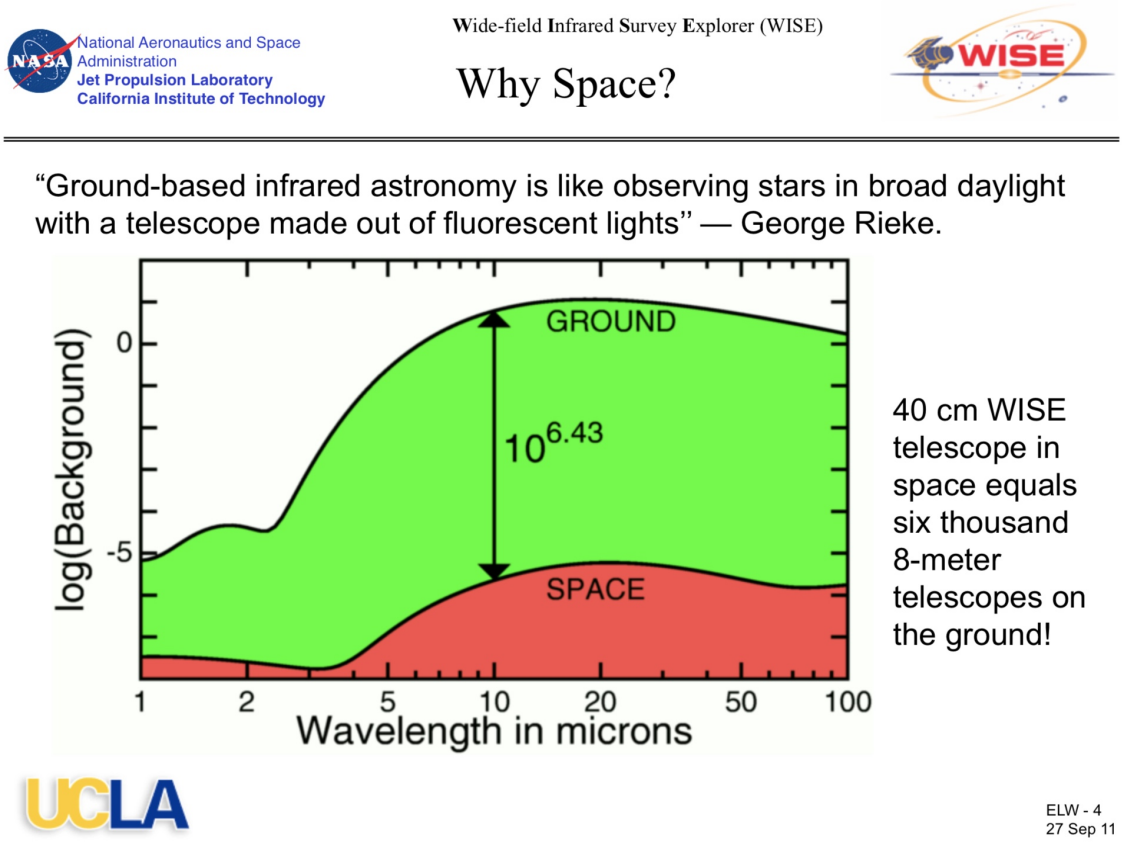

Figure 1: Ned Wright's talk; https://www.ipac.caltech.edu/exgal2011/sched.shtml

■ Technical Justification

Sample being defined...
Likely build on Red X-Shooter targets.

Things to think about::
NIRSpec vs. NIRISS?
NIRSpec since it has the higher resolution modes

Things to think about::
NIRSpec IFU vs. NIRSpec fixed slits (FS) ??
Both have ≈the same wavelength coverage. Need to run ETC.

Our targets are well spaced in R.A. and Decl.

NIRSpec Fixed Slits (FSs)

Disperser/filter	resolving power	μm	$z = 2.5$	$z = 5$	$z = 6$
G140H/F070LP	$R \sim 2700$	0.81-1.27	2315 - 3630Å	1350 - 2120Å	1157 - 1814Å
G140H/F100LP		0.97-1.82	2770 - 5200Å	1617 - 3033Å	1386 - 2600 Å
G235H/F170LP		1.66-3.05	4743 - 8714Å	2766 - 5083 Å	2371 - 4357 Å
G235H/F170LP		2.87-5.14	8200Å -1.46μm	4783 - 8566 Å	4100 - 7332 Å

`jwst-docs.stsci.edu/display/JTI/NIRSpec+Fixed+Slits+Spectroscopy`

Special Requirements (if any)

Justify Coordinated Parallel Observations (if any)

Justify Duplications (if any)

Data Processing & Analysis Plan (AR only)

Management Plan (AR only)