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

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 $z \approx 2.5$.

Technical Justification

Sample is given in Figure 2. There are 11 QSOs with confirmed spectroscopic redshifts, with redshift range $5.0 < z < 6.7$ and strong, SNR$\geq$ 5 WISE detections in the W3 12μm band.

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 $\approx$the same wavelength coverage. Need to run ETC.

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

Special Requirements (if any)

Justify Coordinated Parallel Observations (if any)

Justify Duplications (if any)

Data Processing & Analysis Plan (AR only)

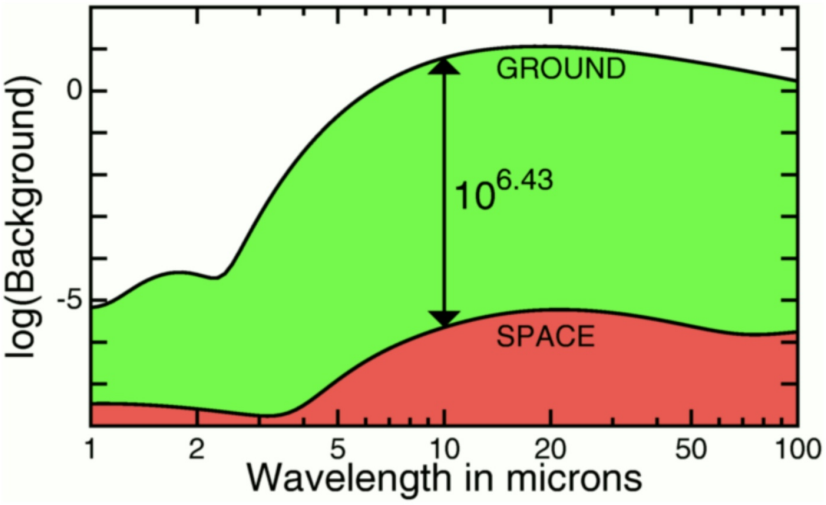
Management Plan (AR only)

National Aeronautics and Space Administration
Jet Propulsion Laboratory
California Institute of Technology

Wide-field Infrared Survey Explorer (WISE)

Why Space?

"Ground-based infrared astronomy is like observing stars in broad daylight with a telescope made out of fluorescent lights" — George Rieke.



40 cm WISE telescope in space equals six thousand 8-meter telescopes on the ground!

UCLA

ELW - 4
27 Sep 11

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

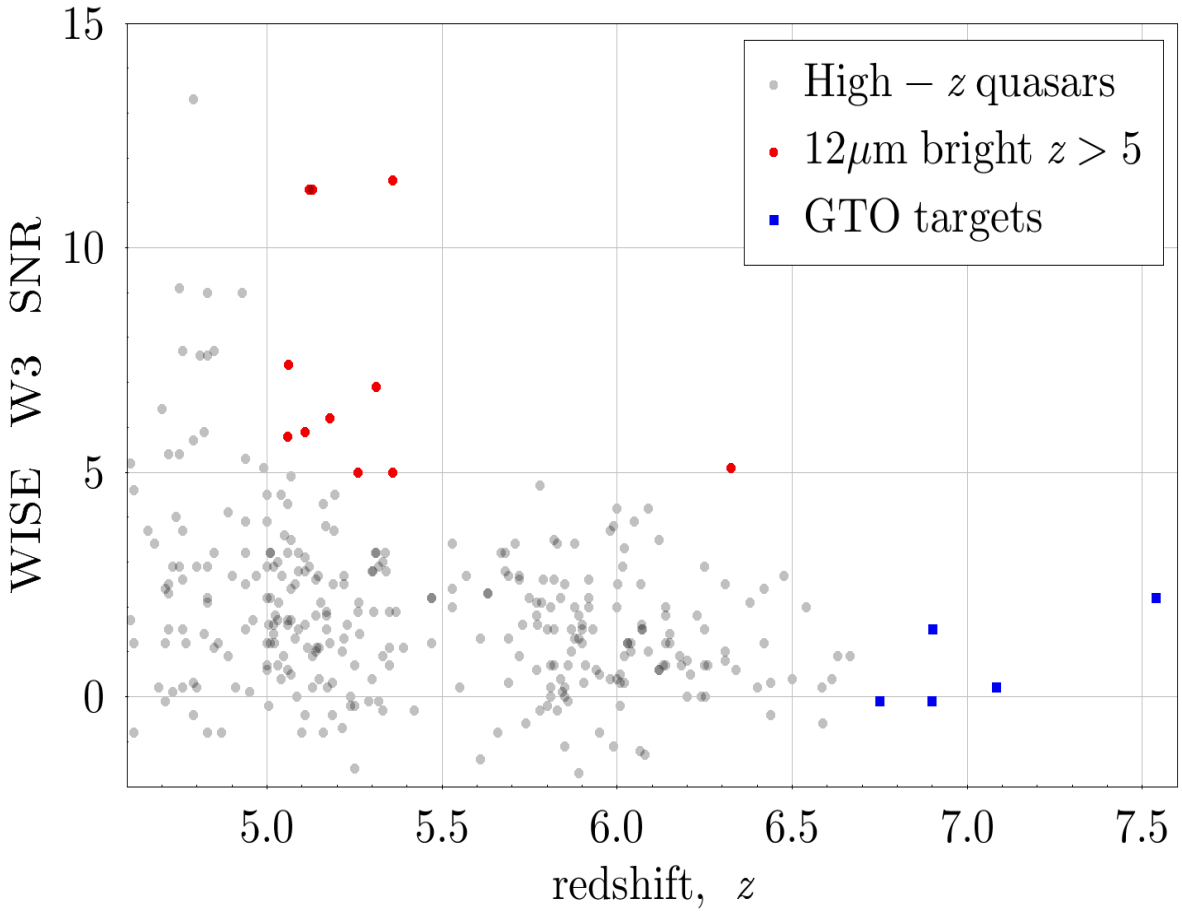


Figure 2: The WISE W3 SNR values for all spectroscopically confirmed $z \geq 5$ quasars. Our sample are the red circles; the GTO reserved targets are the blue squares.