

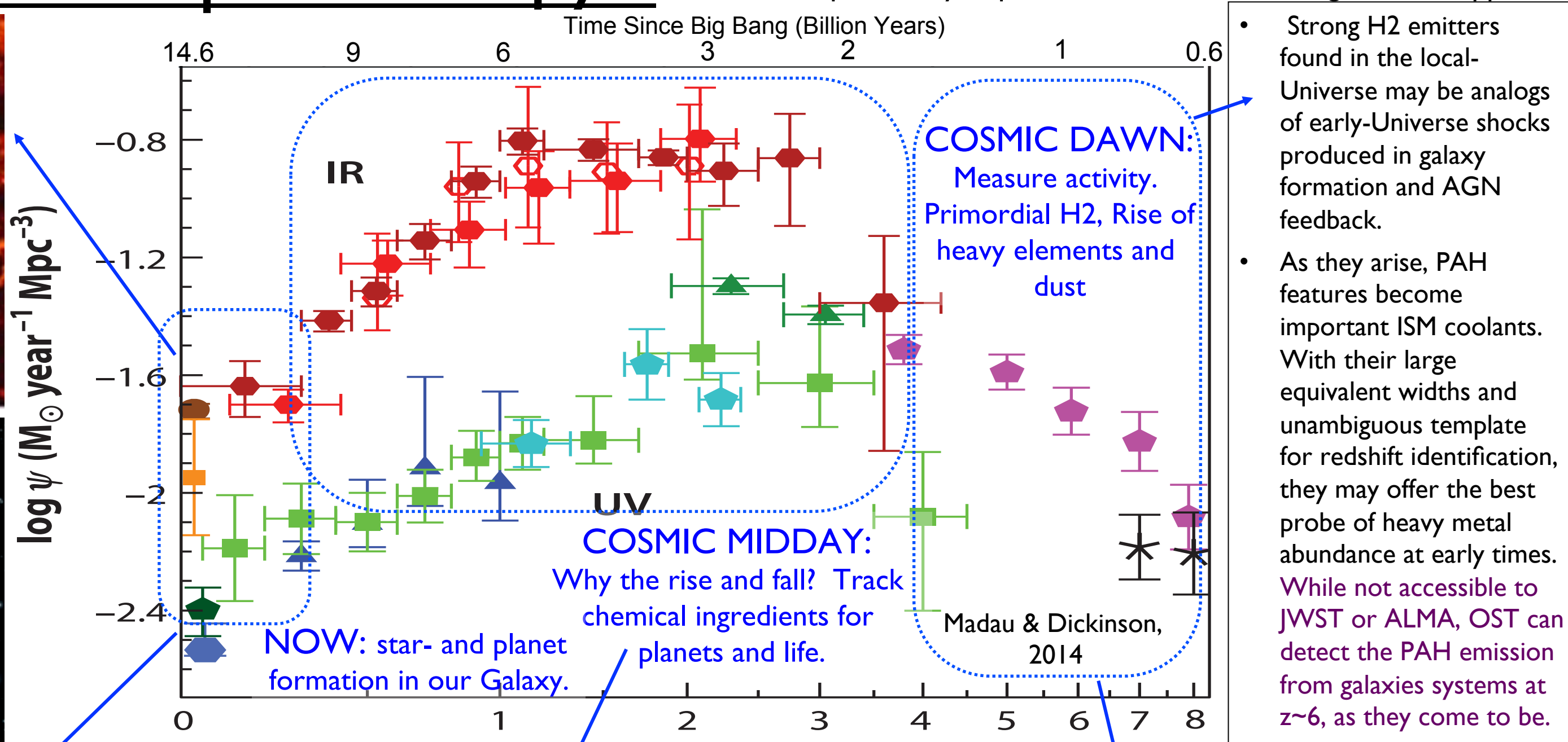
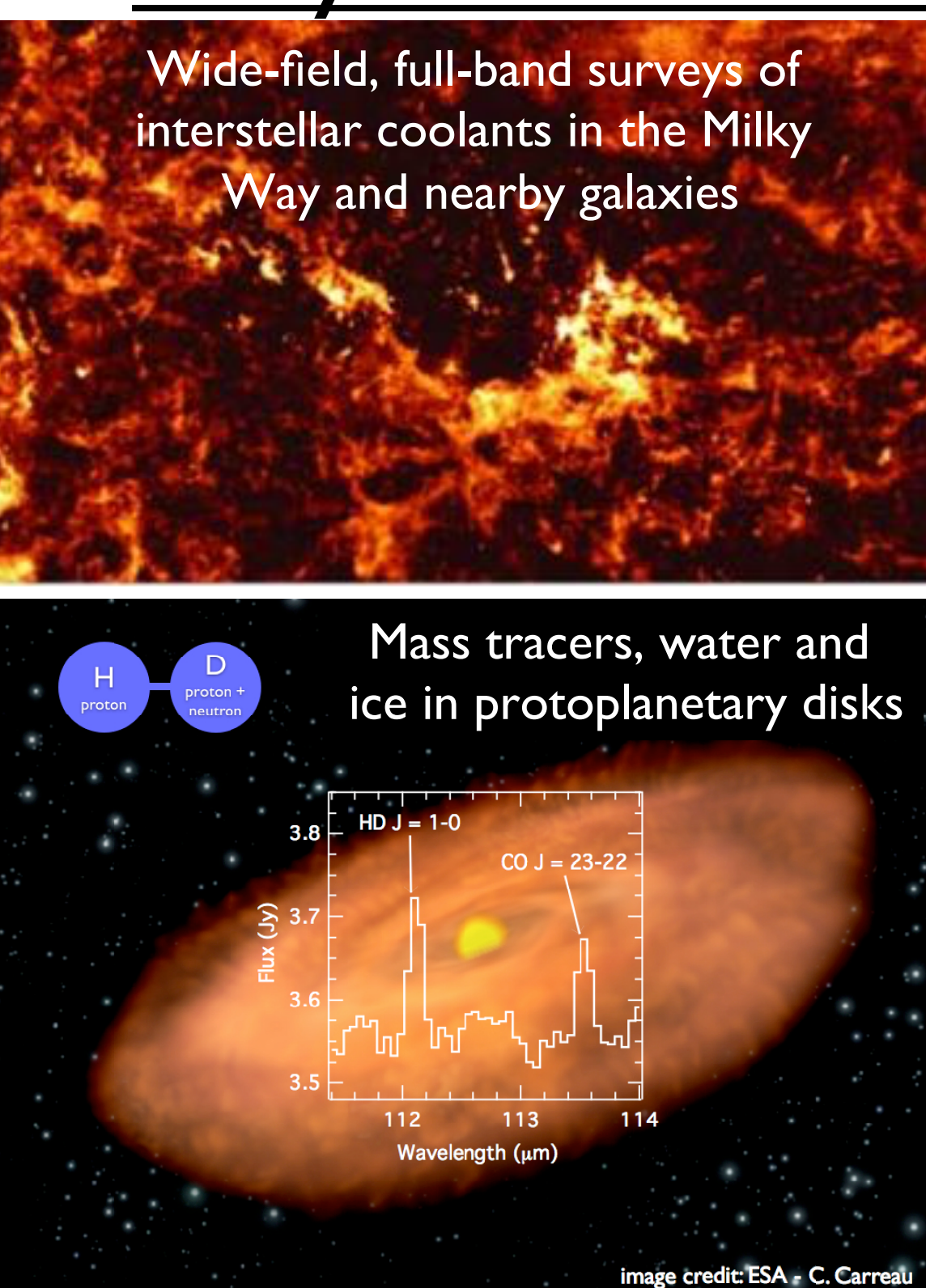
Mid-Resolution Survey Spectrometer for OST

A workhorse far-IR spectrograph powering new discoveries with OST.

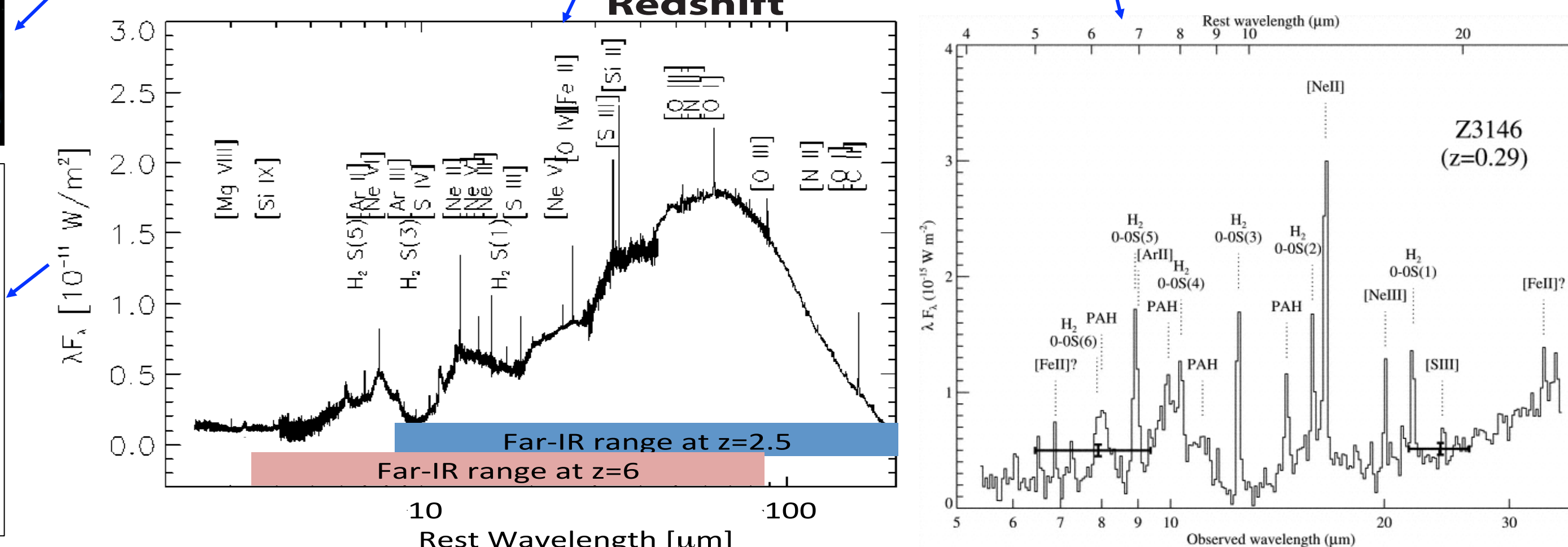
Matt Bradford + MRSS team for the OST

Why Sensitive Far-IR Spectroscopy ?

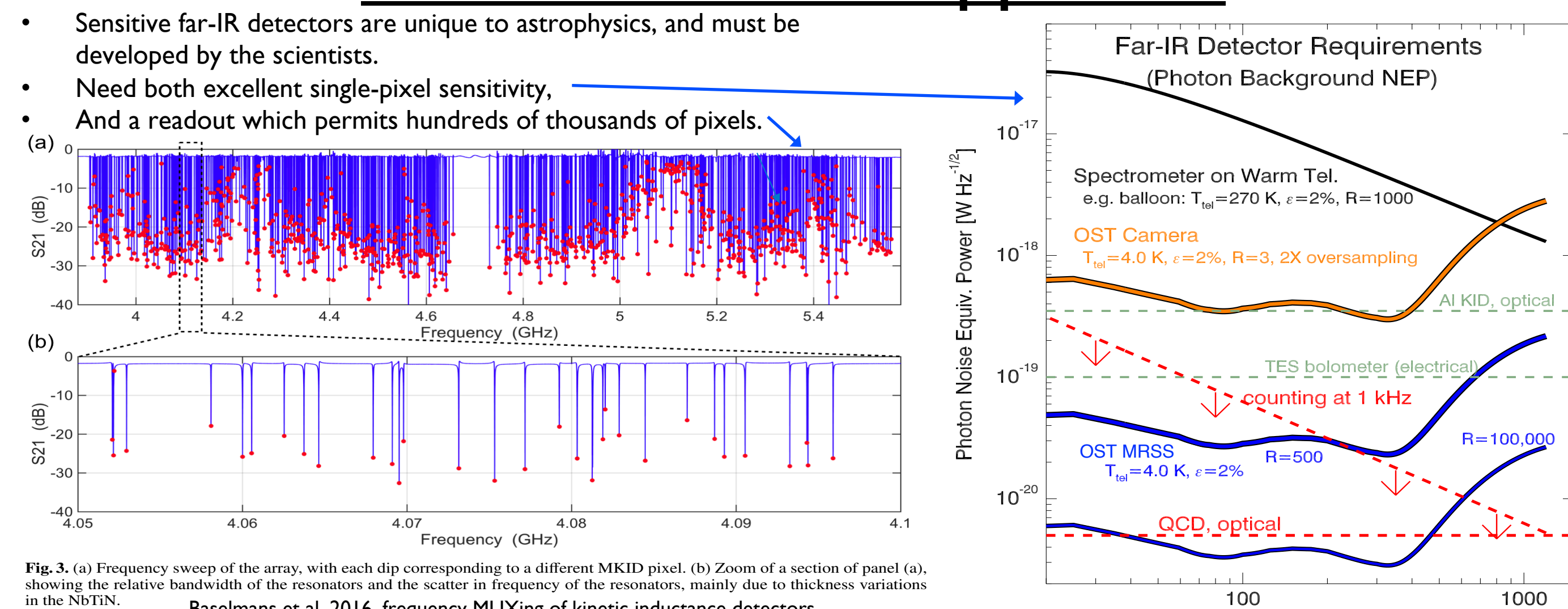
See also posters by Pope+, Armus+, Vieira+, Wright+, Pontoppidan+



- Provides redshifts -- **3-D view of the far-IR Universe**
- Expect spectra of ~billions of galaxies in blind surveys**
- Measures cooling of the ionized, neutral atomic, and molecular gas, the primary ISM cooling channels.
- N/O ratio a measure of metallicity and stellar processing history.
- Reveals UV field intensity and hardness – constrains ionizing source: accretion or massive stars. (e.g. [OIV] / [OIII], Ne sequence)

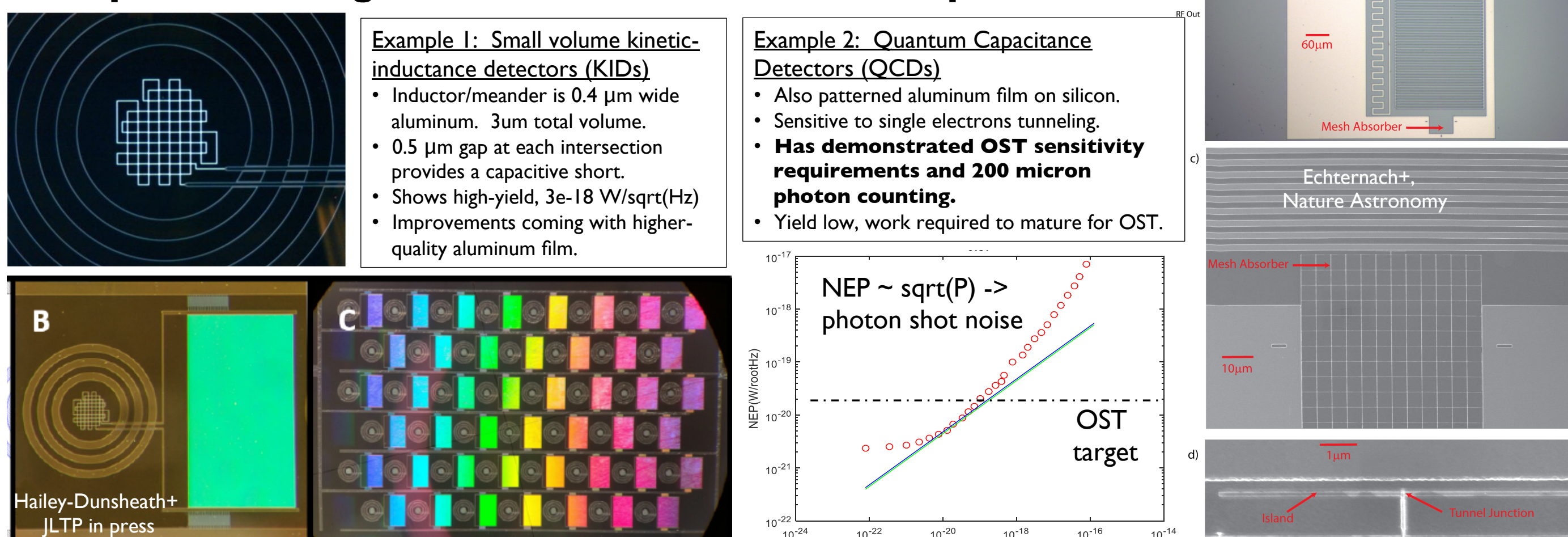


MRSS Detector Approach



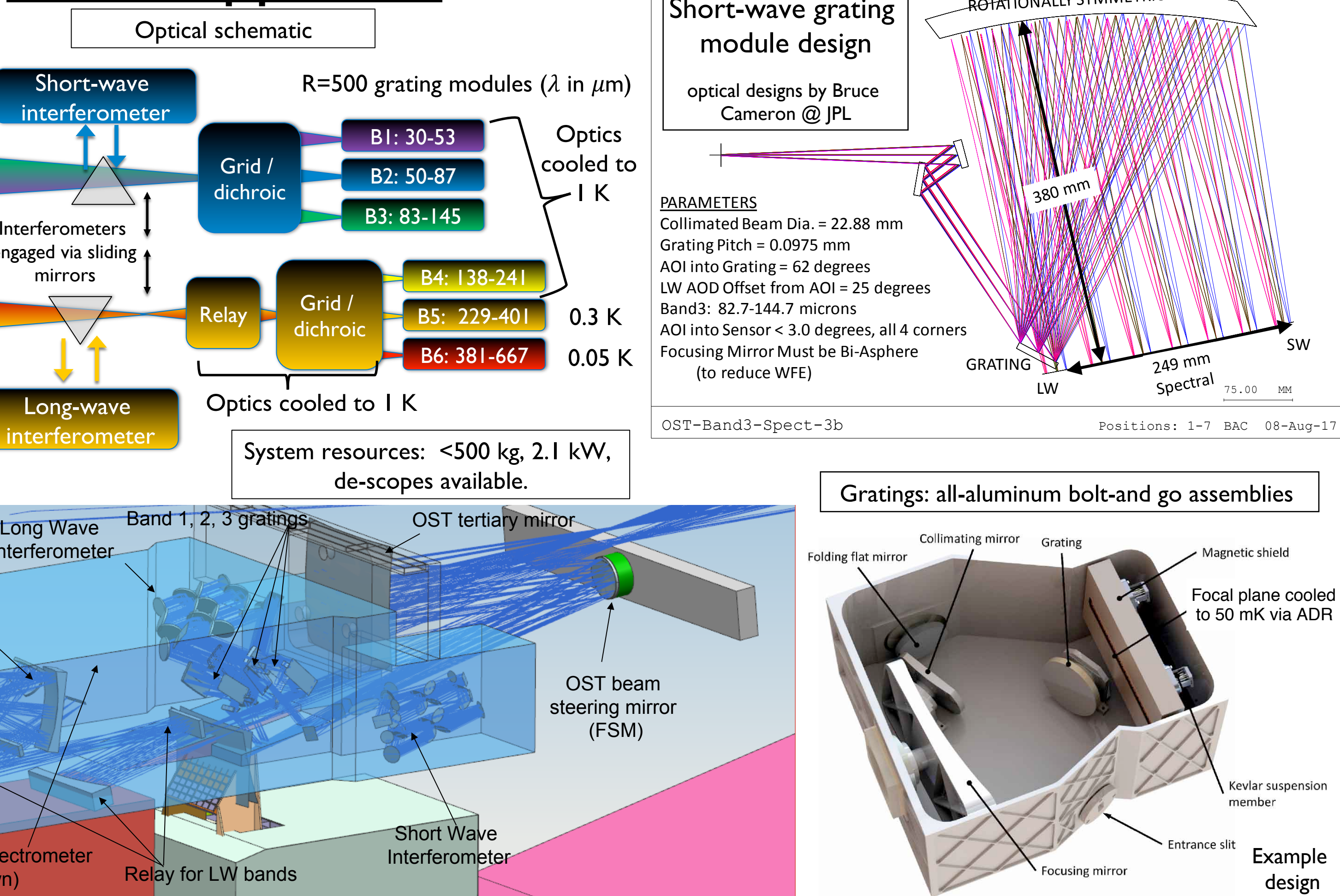
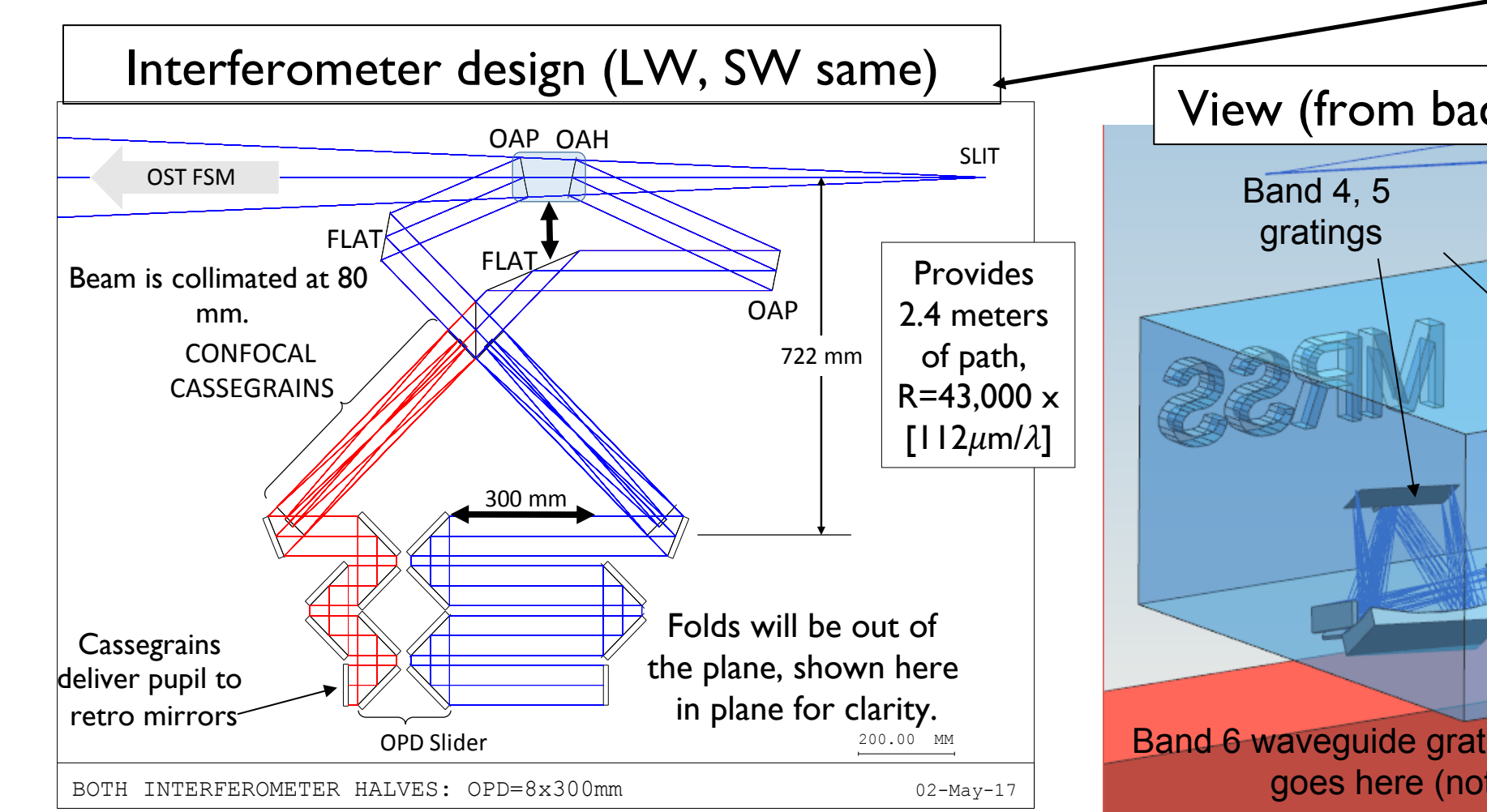
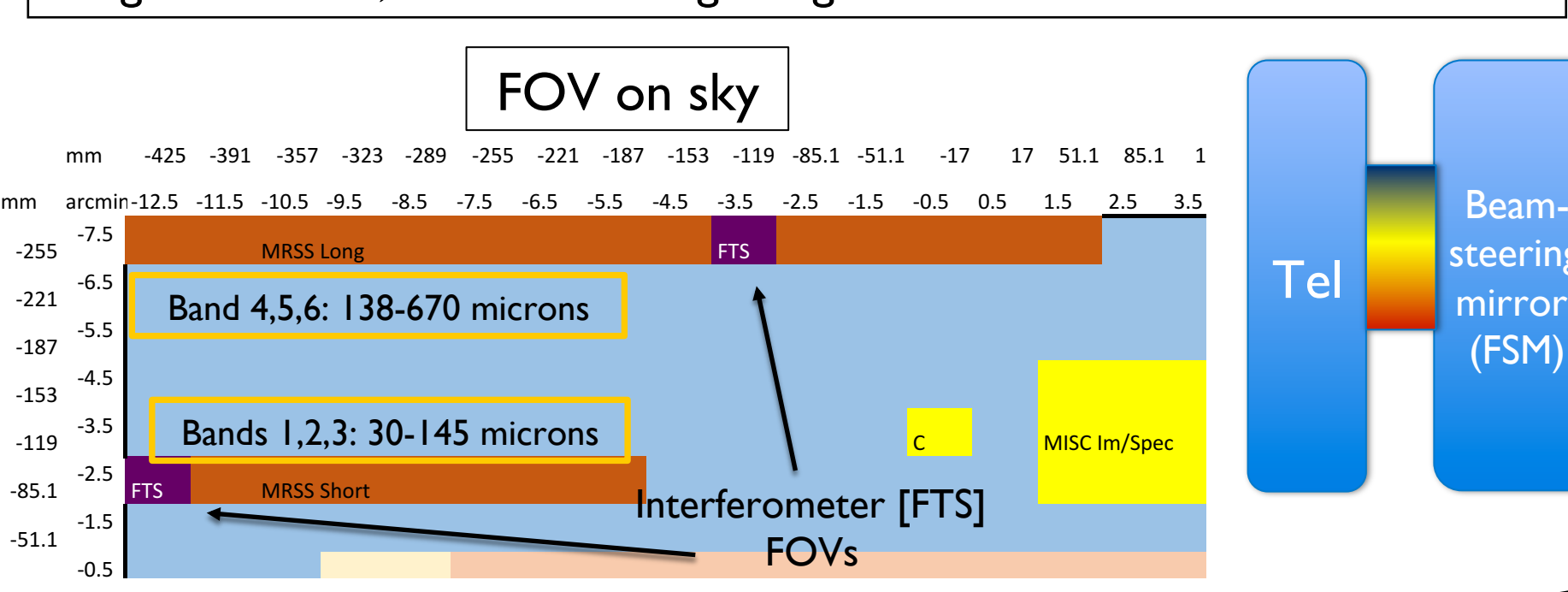
Readout using high-Q superconducting resonators enables the large formats. MRSS uses 100 MHz to 1 GHz readout band to carry 1500 pixels per circuit: 132 circuits for 200,000 total pixels.

Superconducting Detectors: Photons Break Cooper Pairs

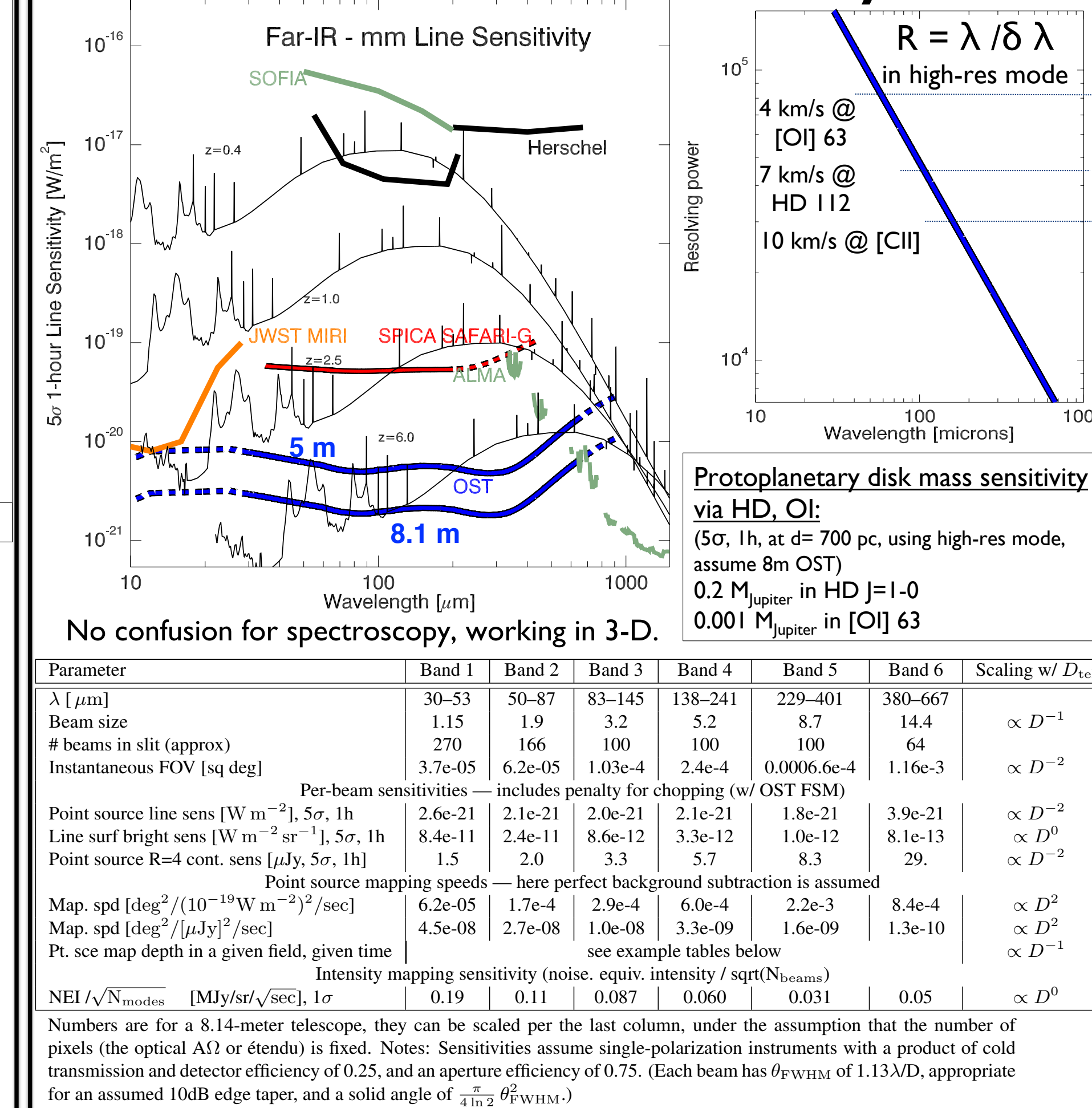


MRSS Approach

- Two long-slit fields on the sky: short wave and long wave.
- Each with 3 wideband grating modules, combine for full band coverage.
- Interferometer engaged when desired for high-res mode, processes light with FTS, feeds to same grating backend.



Excellent Sensitivity



The Origins Space Telescope is the mission concept for the Far Infrared Surveyor, a study in development by NASA in preparation for the 2020 Astronomy and Astrophysics Decadal Survey.

Twitter: @NASAOriginsTele
<http://origins.ipac.caltech.edu/>
Secret OST Word: Sensitivity