



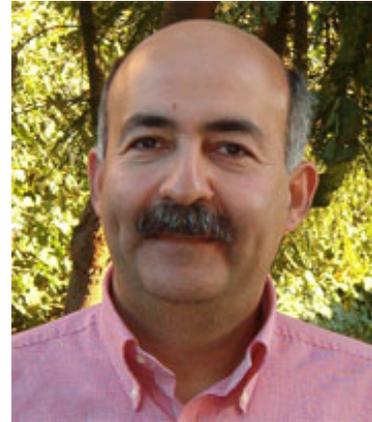
IRMS

Nick Konidakis (Caltech)

17 July 2014

Shanghai Team

California team



Bahram
Mobasher
(UCR)

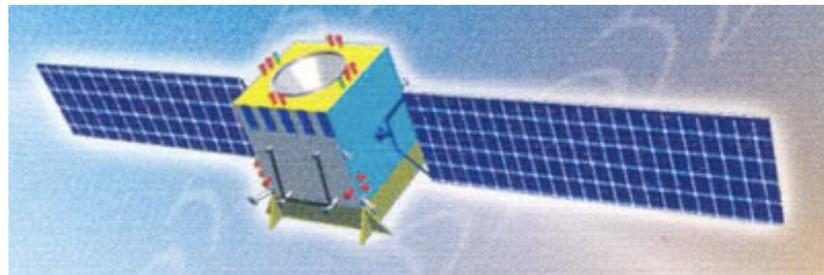


Vivian U
(UCR)

SITP engineers, Lei Hao (SHAO),
NPK

Shanghai Institute for Technical Physics (SITP)

- CAS Institute
- Division 9: remote sensing (expertise in NIR instrumentation) to lead efforts
- Strong partnership with SHAO and Lei Hao



Outline

- The state of the art in ELTs
- + IRMS v MOSFIRE [5 min]
- functional performance of IRMS [15 min]
- potentially juicy science topics [10 min]
- what's next/conclusions
- 15 min question/discussion

TMT

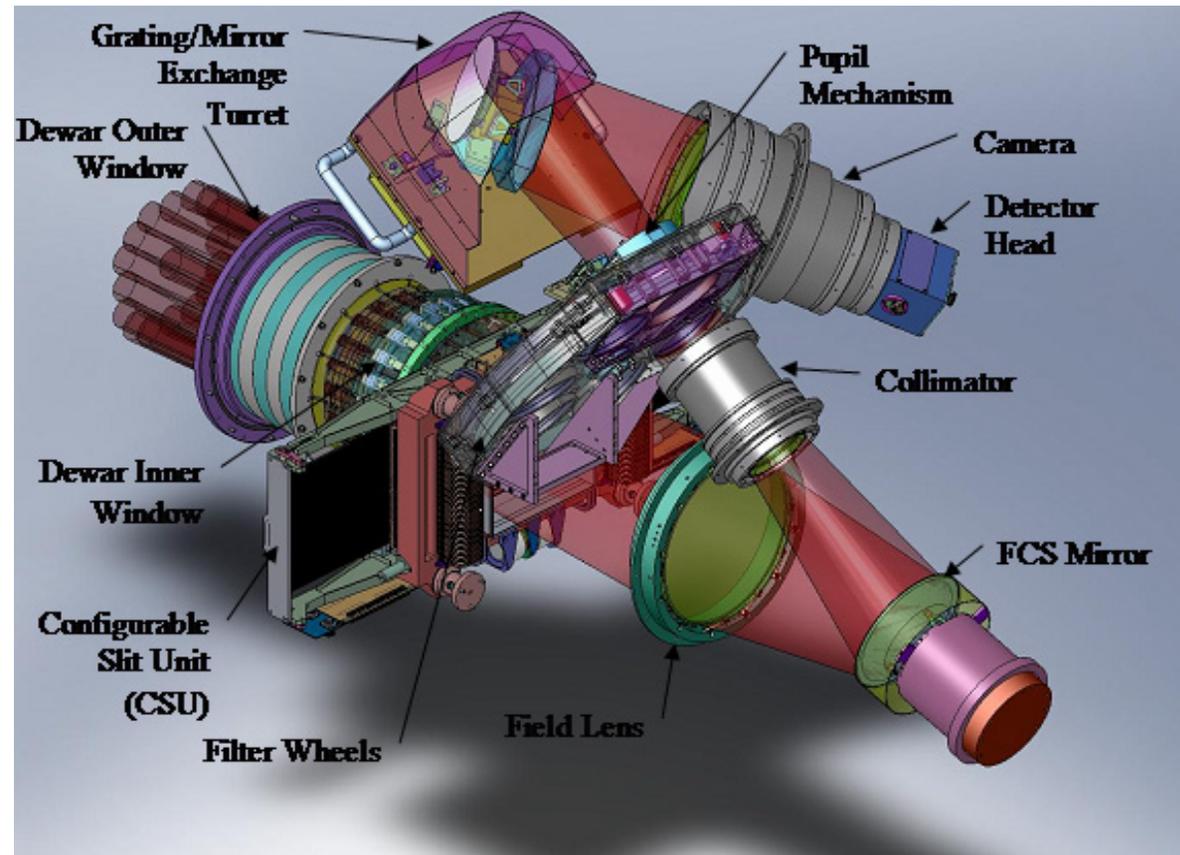
IRMS

2' x 1'

AO assisted

0.9 - 2.5 μm

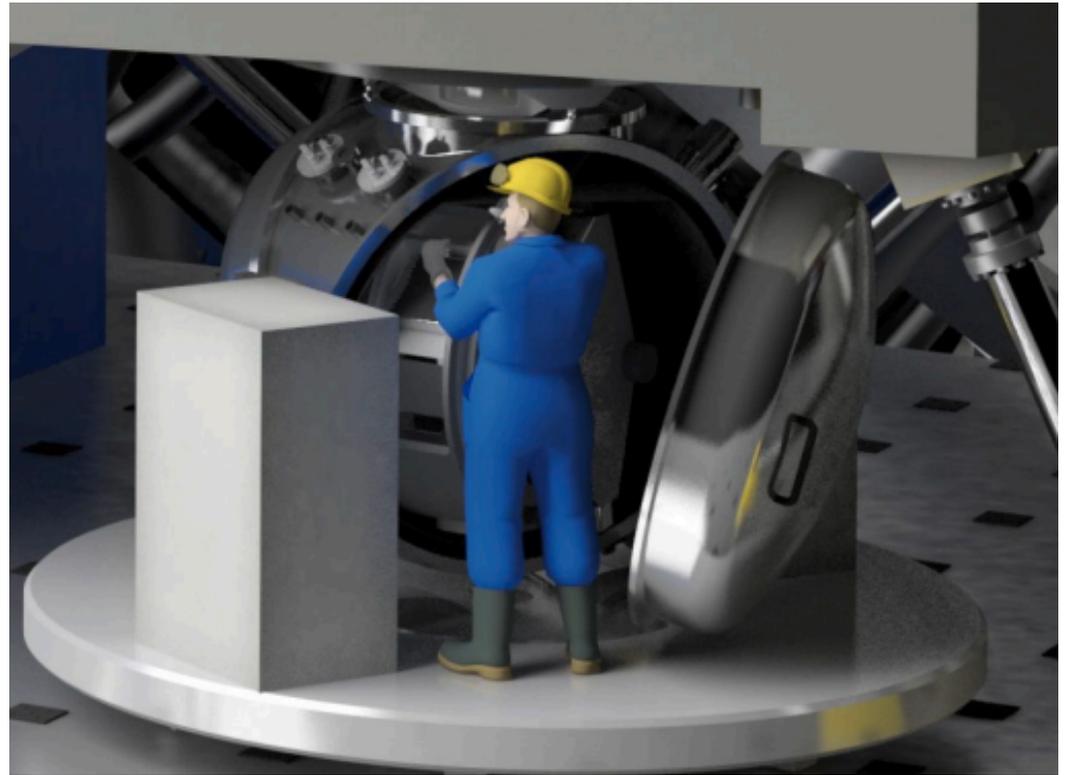
R~3200+



E-ELT

ELT-CAM

1' x 1' diffraction-limited
0.9 - 2.5 μm
R~10,000+



GMT

NIRMOS

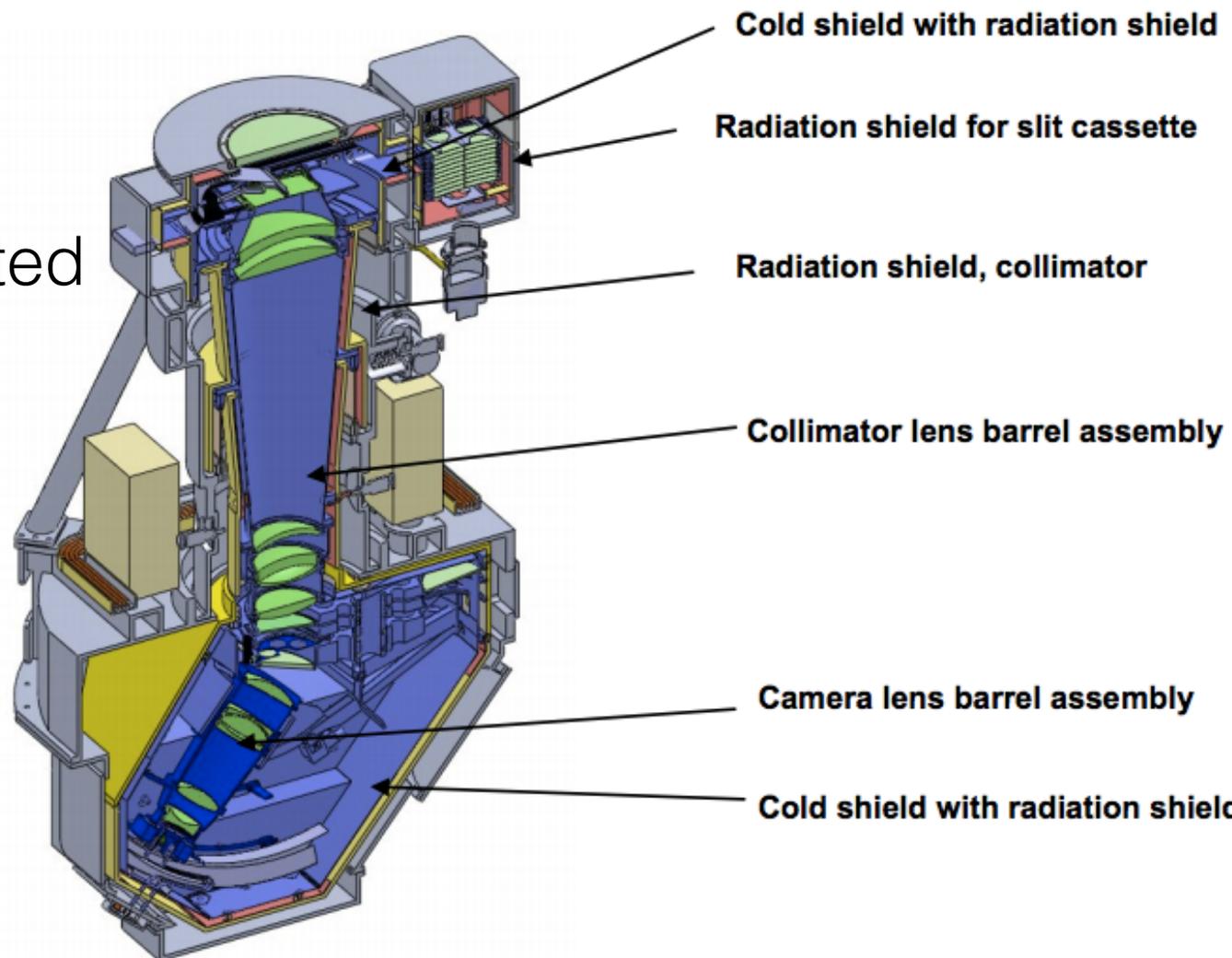
6.5' x 6.5' seeing limited

0.9 - 2.5 μm

R~3000

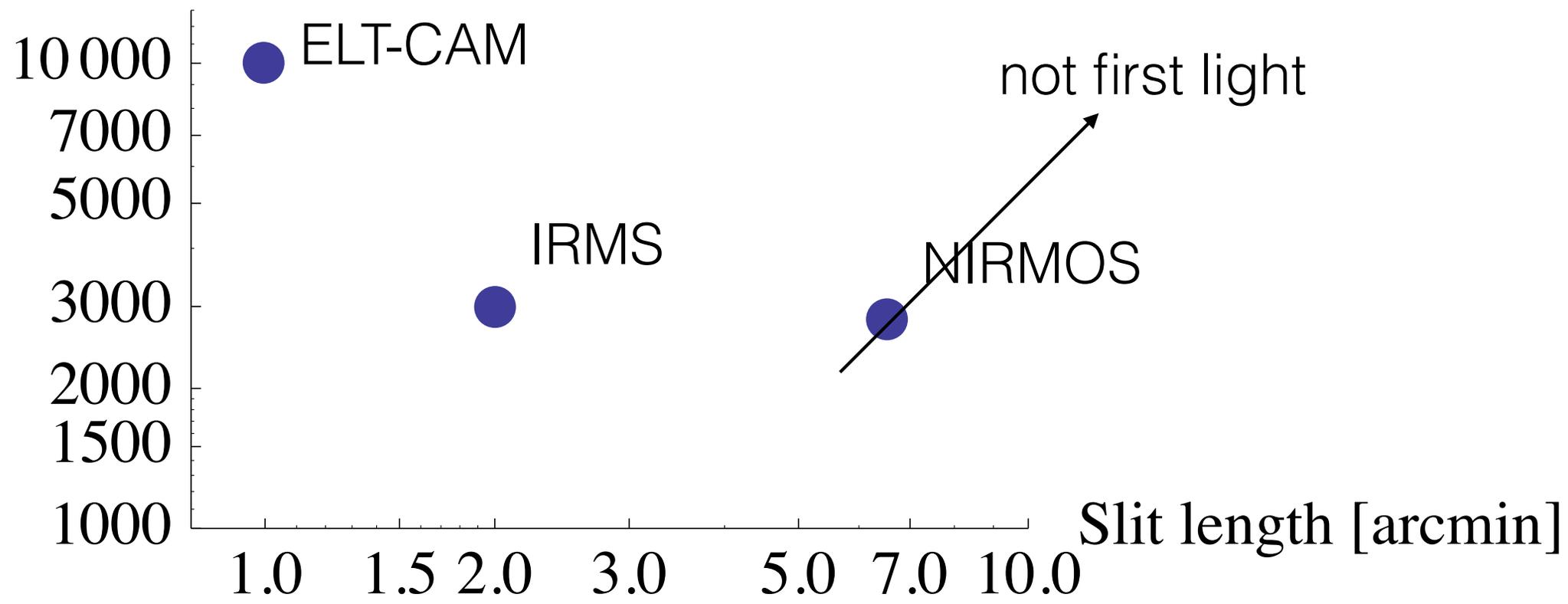
Not first light

GMACS?



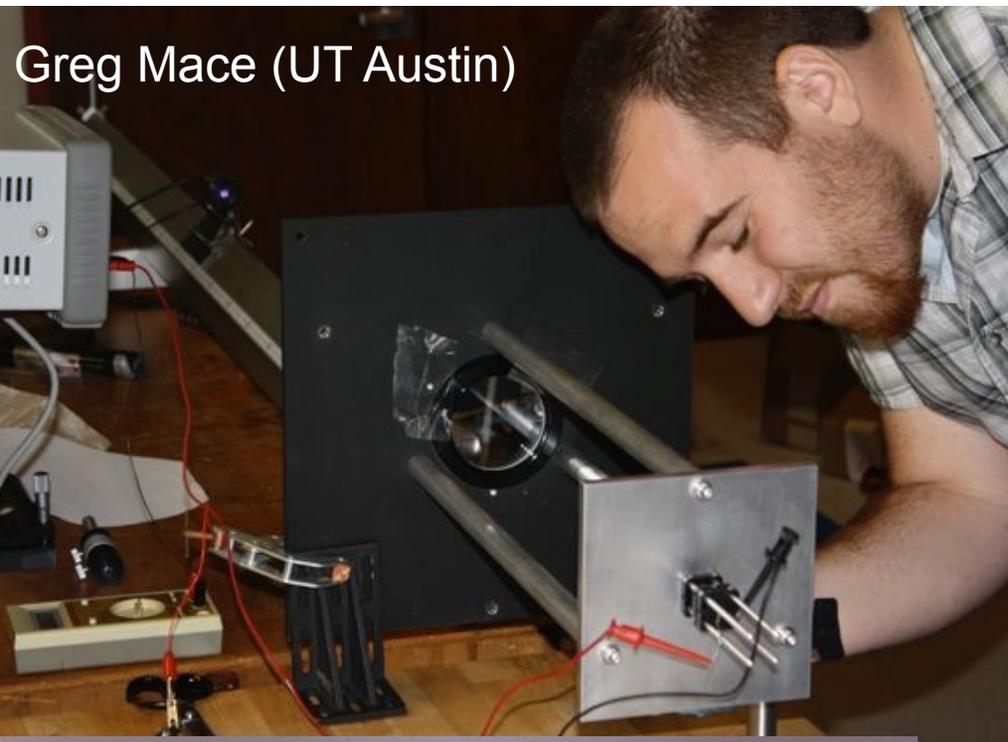
Fabricant+ (2012)

Resolution [R]



IRMS has heritage:
MOSFIRE

Greg Mace (UT Austin)



Kristin Kulas (Ames)

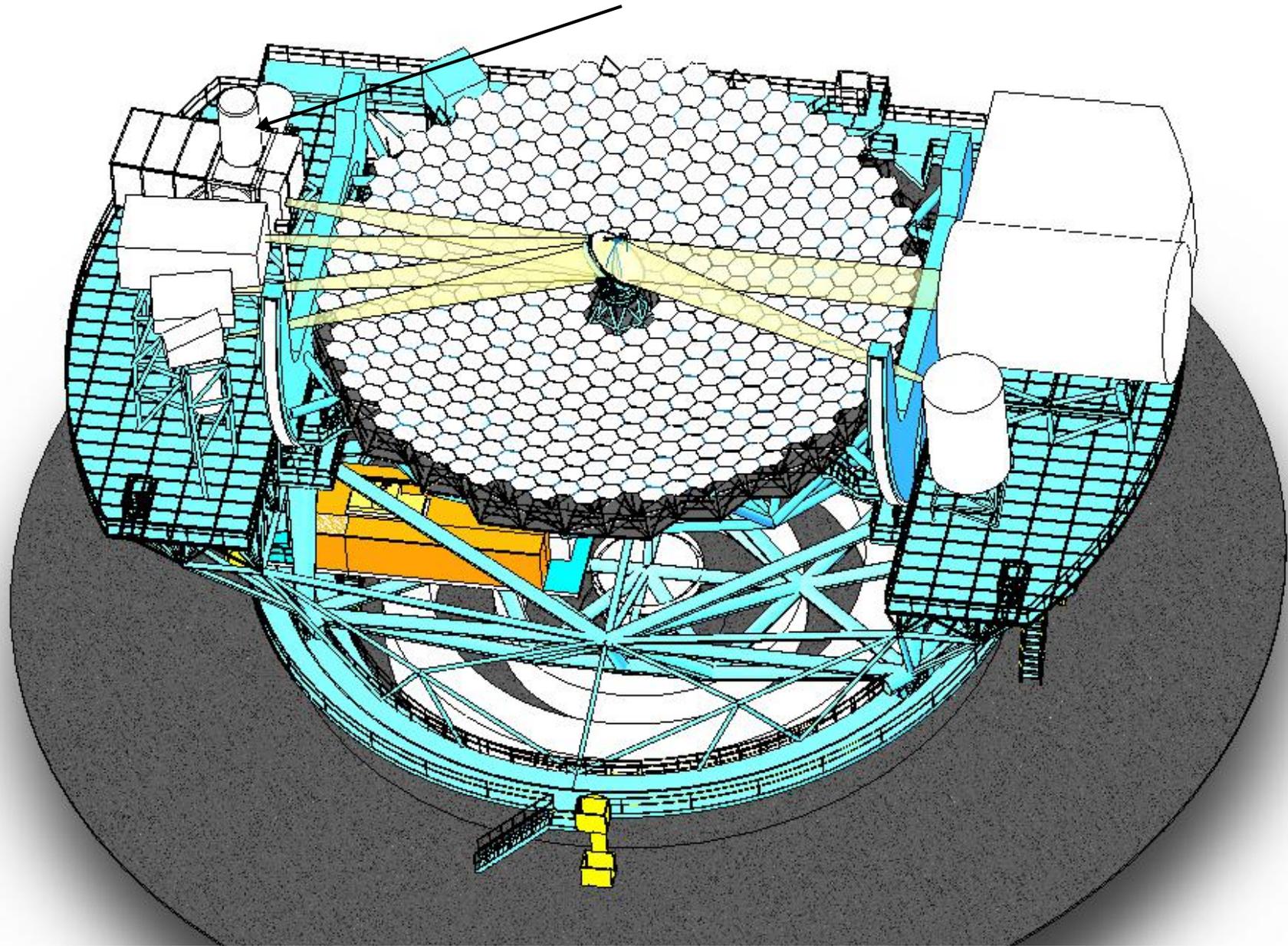


Ryan Trainor (CIT)

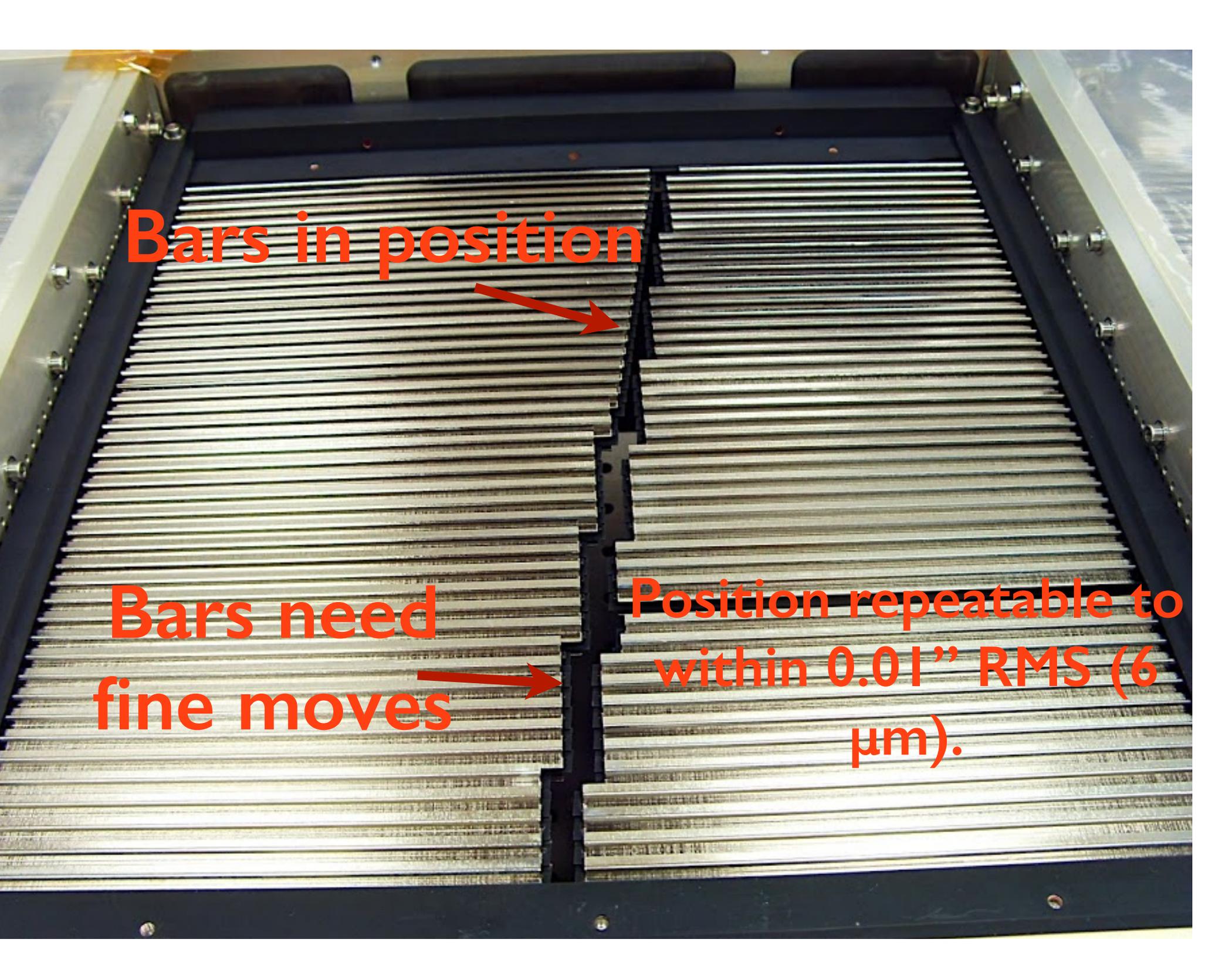


Gwen Rudie (Carnegie)

IRMS







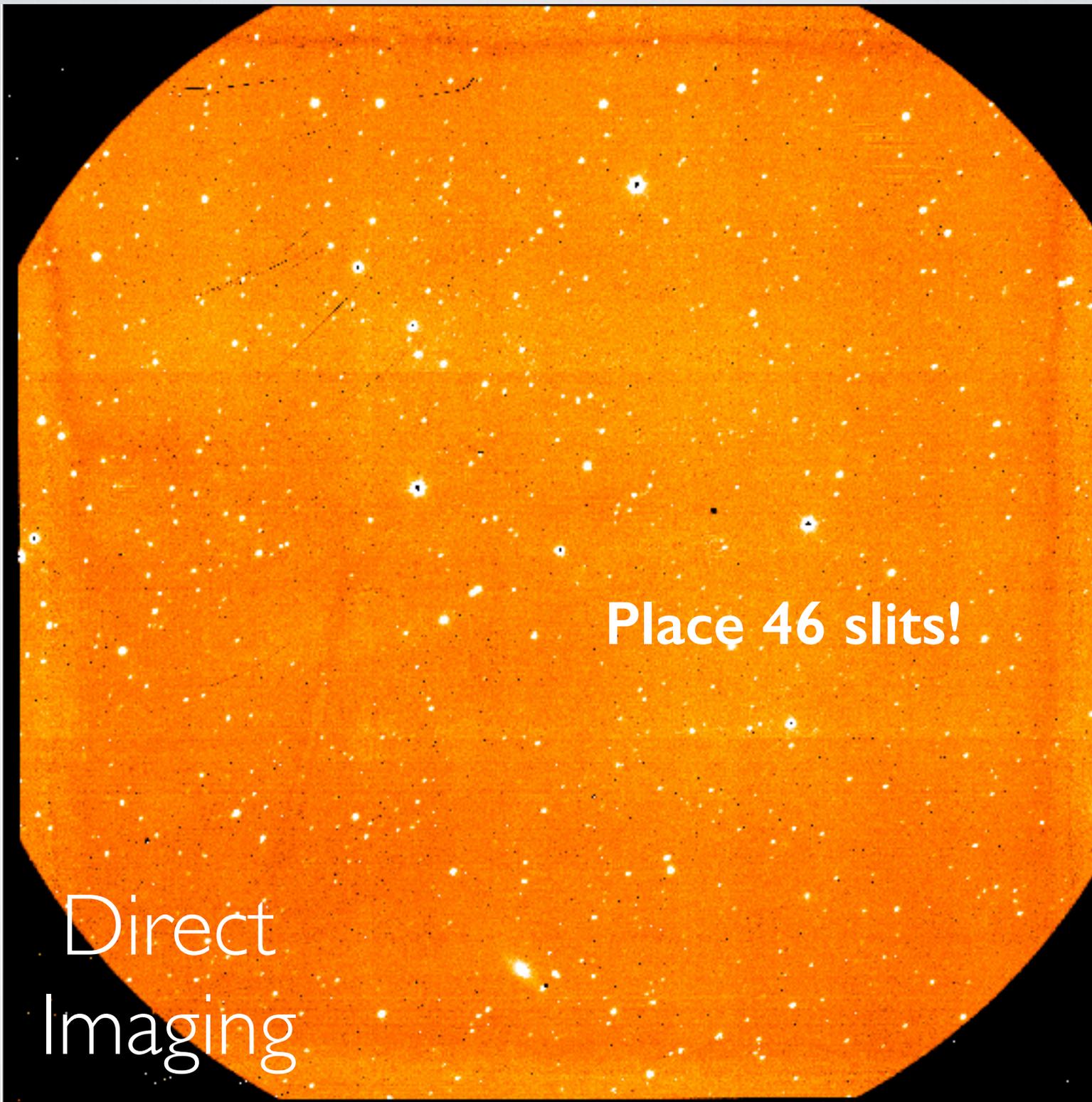
Bars in position

**Bars need
fine moves**

**Position repeatable to
within 0.01" RMS (6
 μm).**

IRMS will be a
pleasure to use

2'



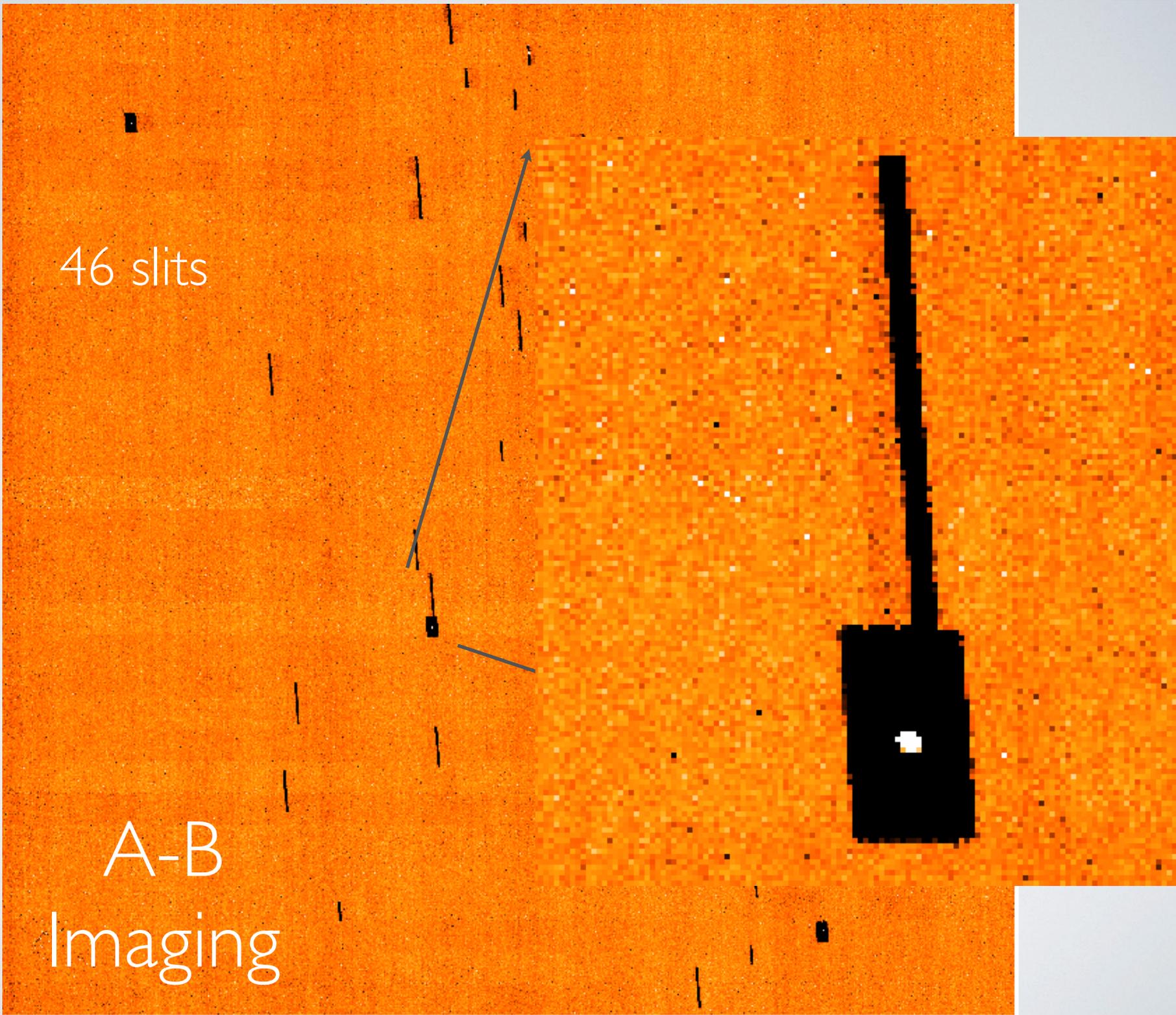
Place 46 slits!

Direct
Imaging

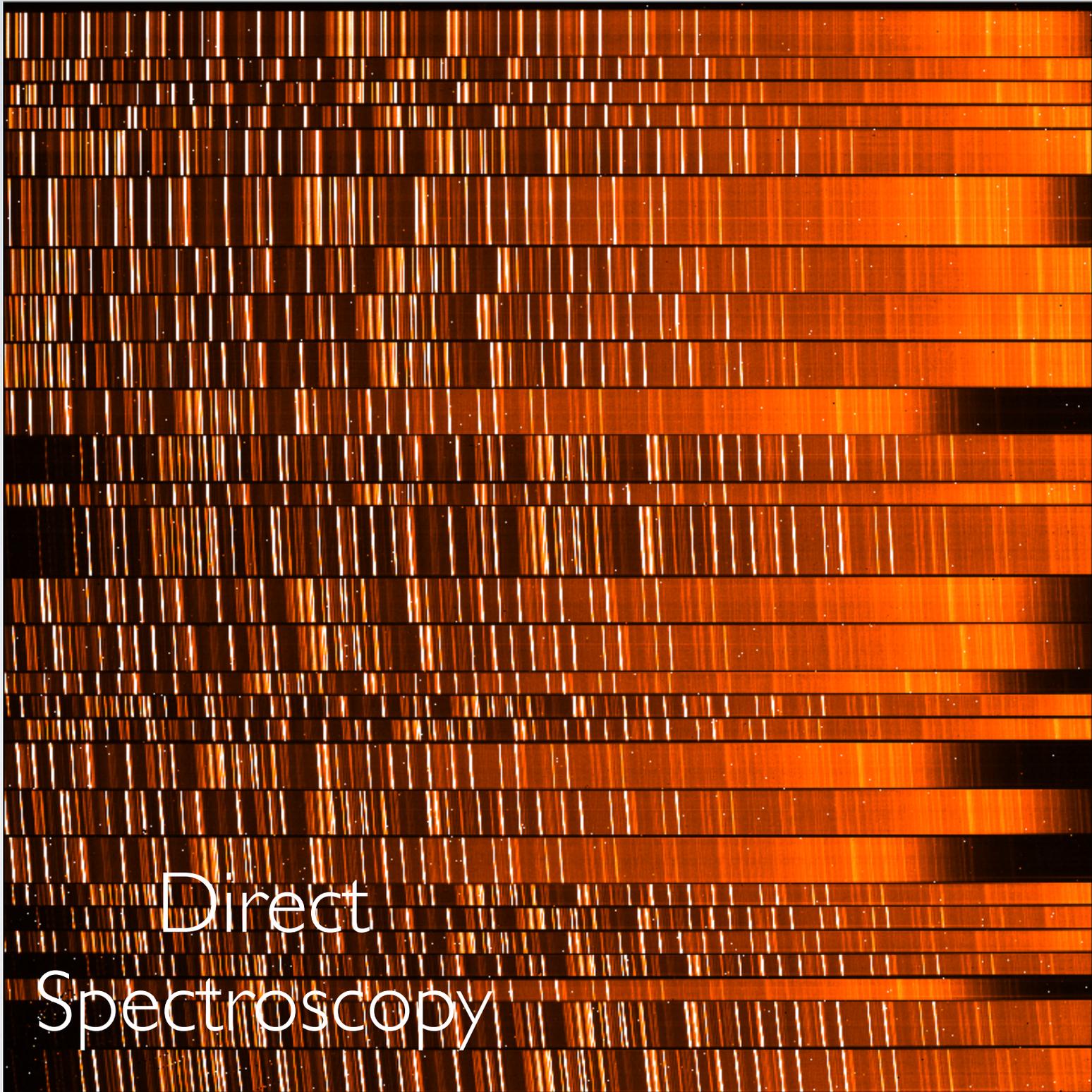
2'

46 slits

A-B
Imaging



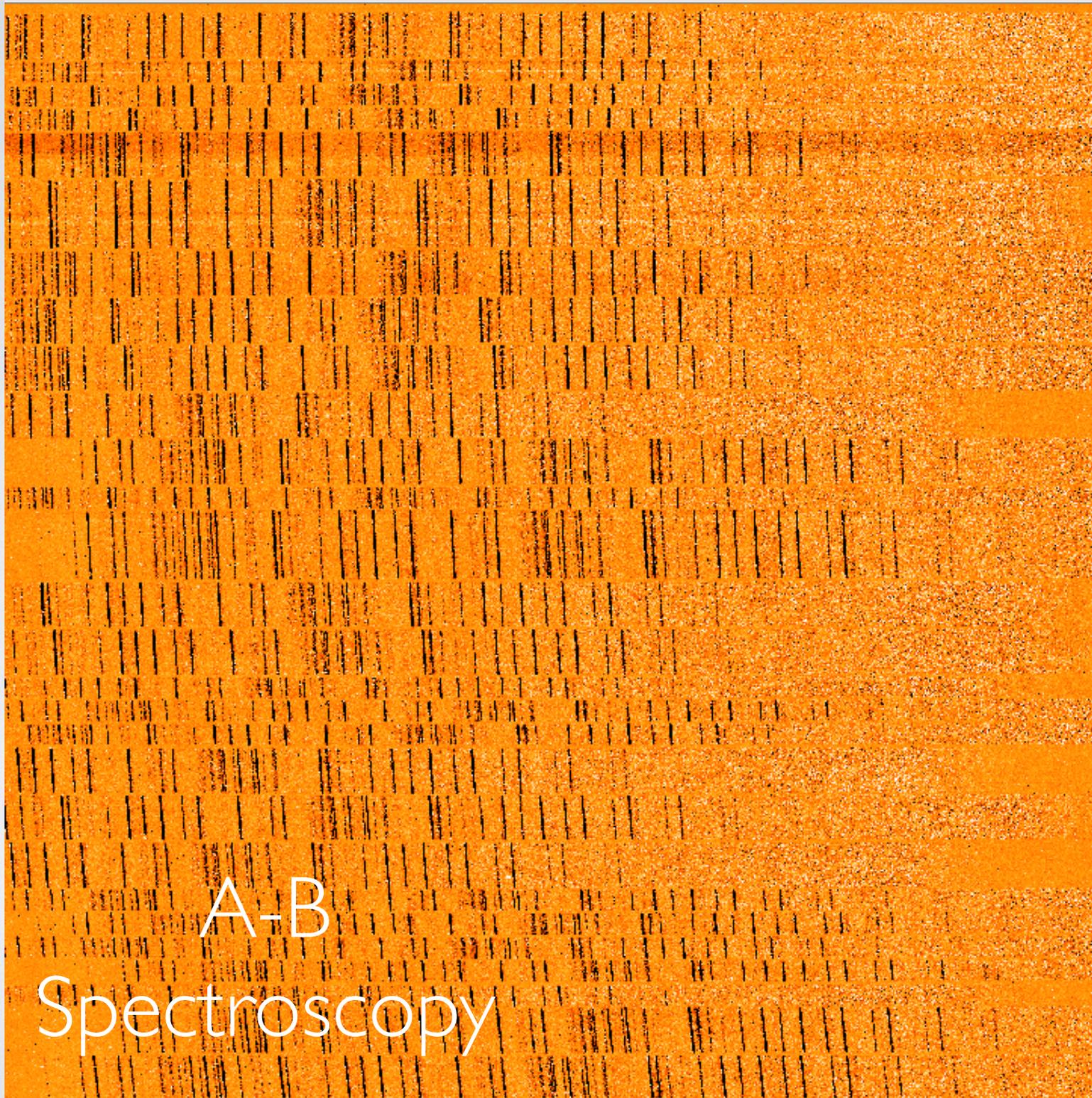
2'



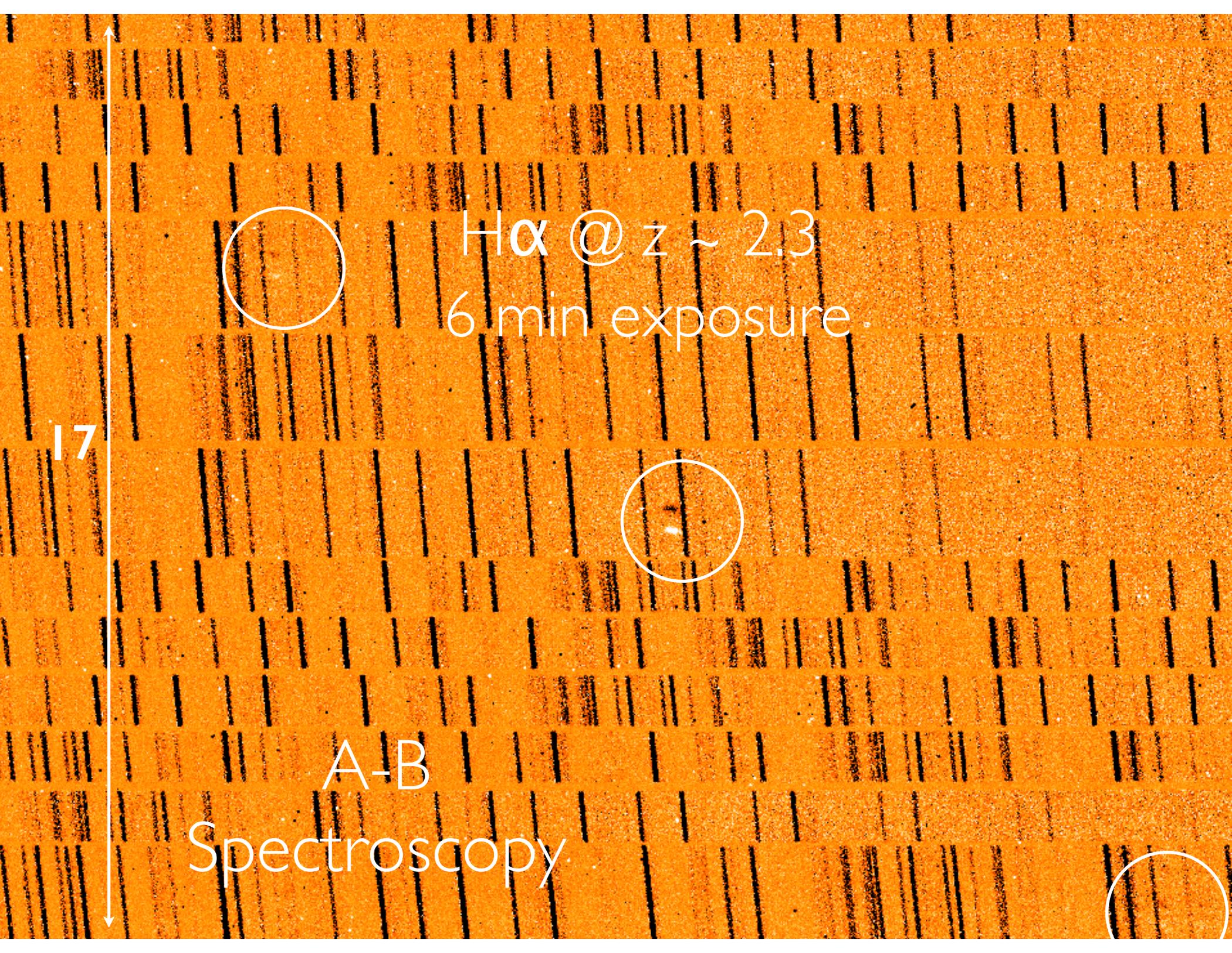
46

Direct
Spectroscopy

2'



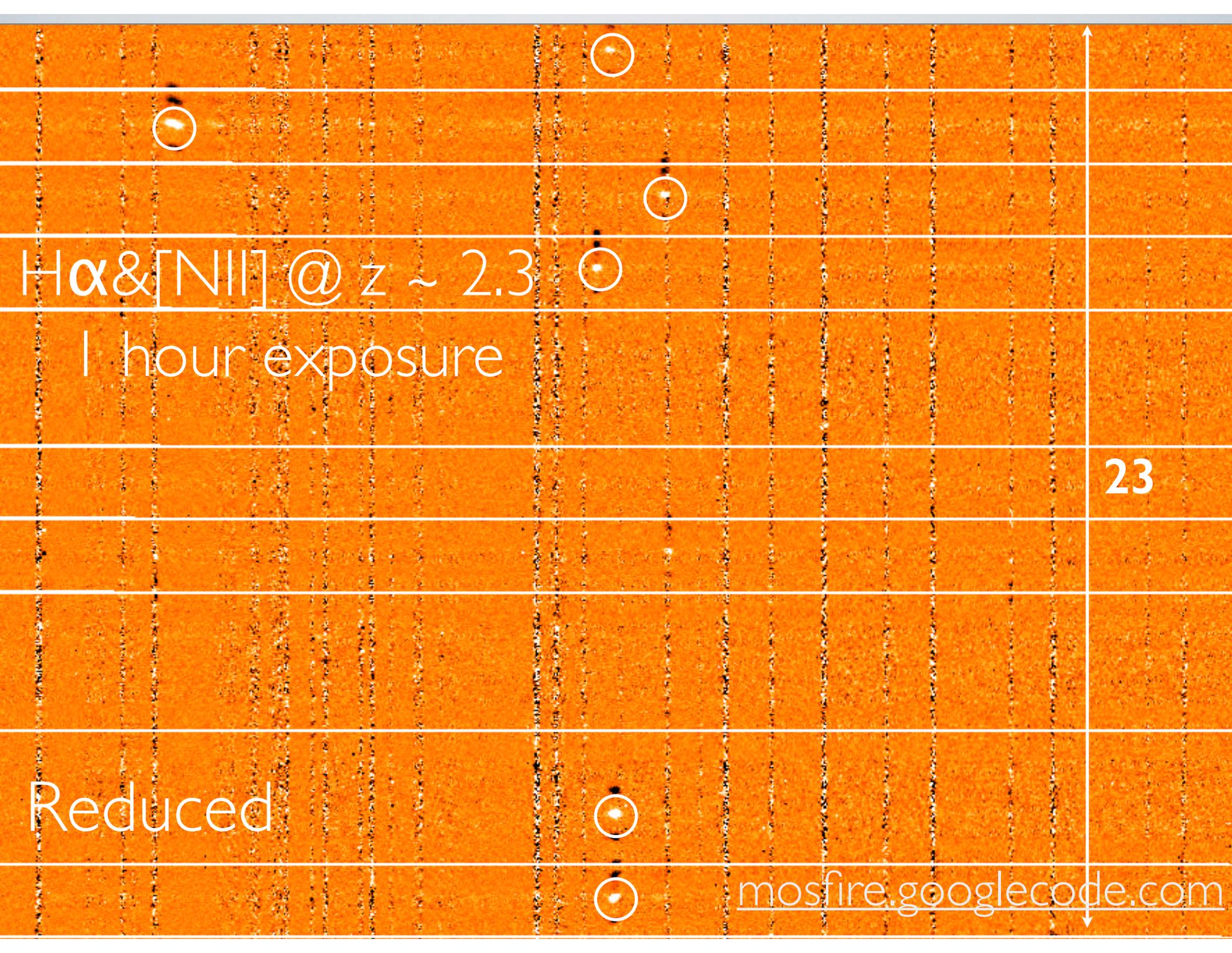
A-B
Spectroscopy



H α @ $z \sim 2.3$
6 min exposure

17

A-B
Spectroscopy



$H\alpha$ & $[NII]$ @ $z \sim 2.3$

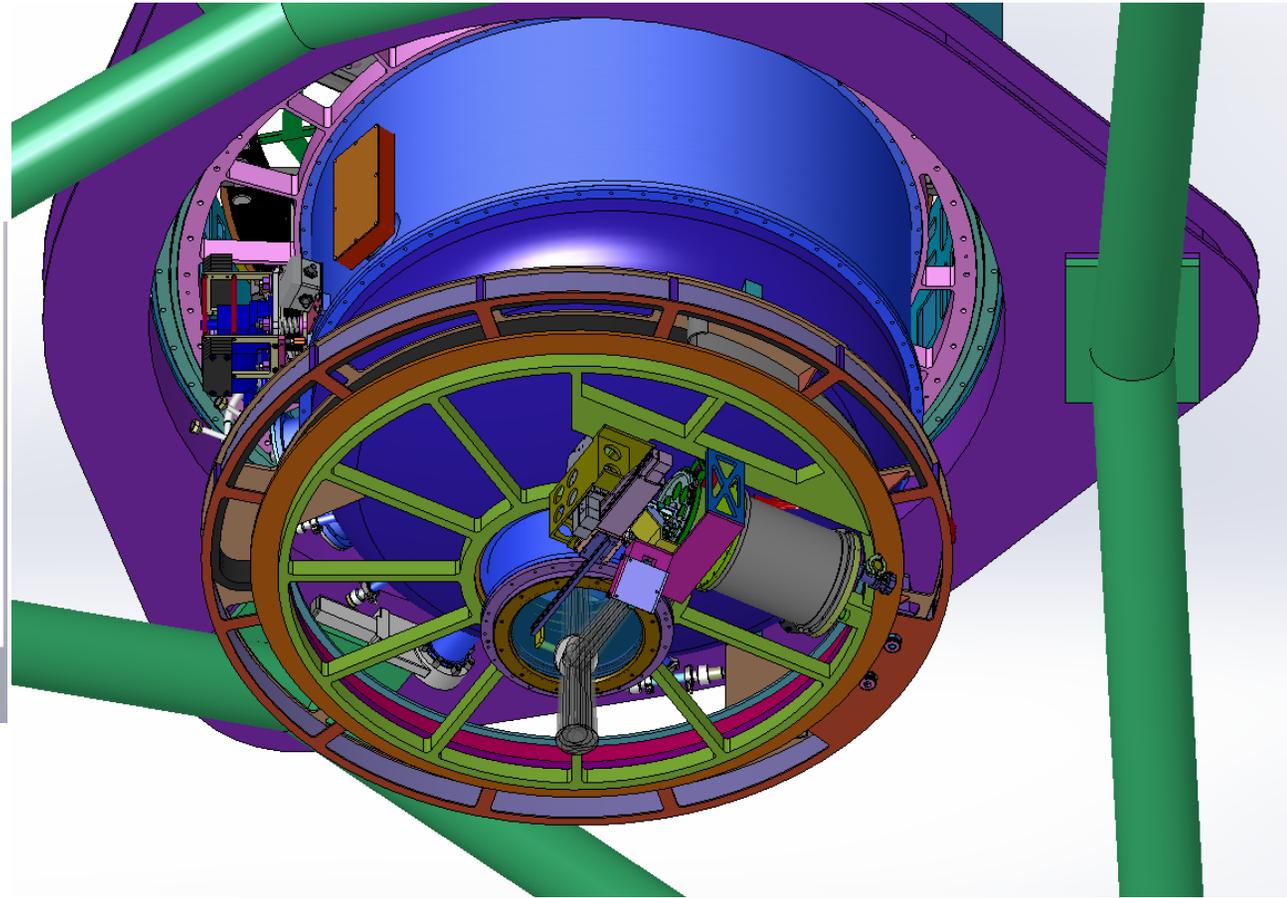
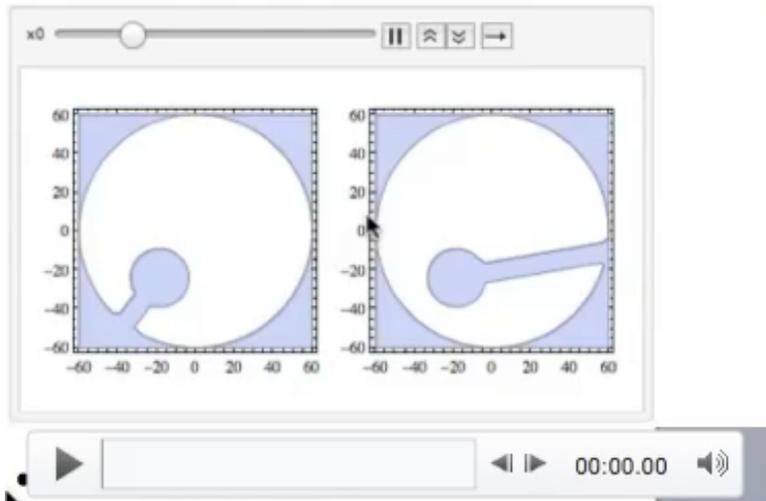
1 hour exposure

23

Reduced

mosfire.googlecode.com

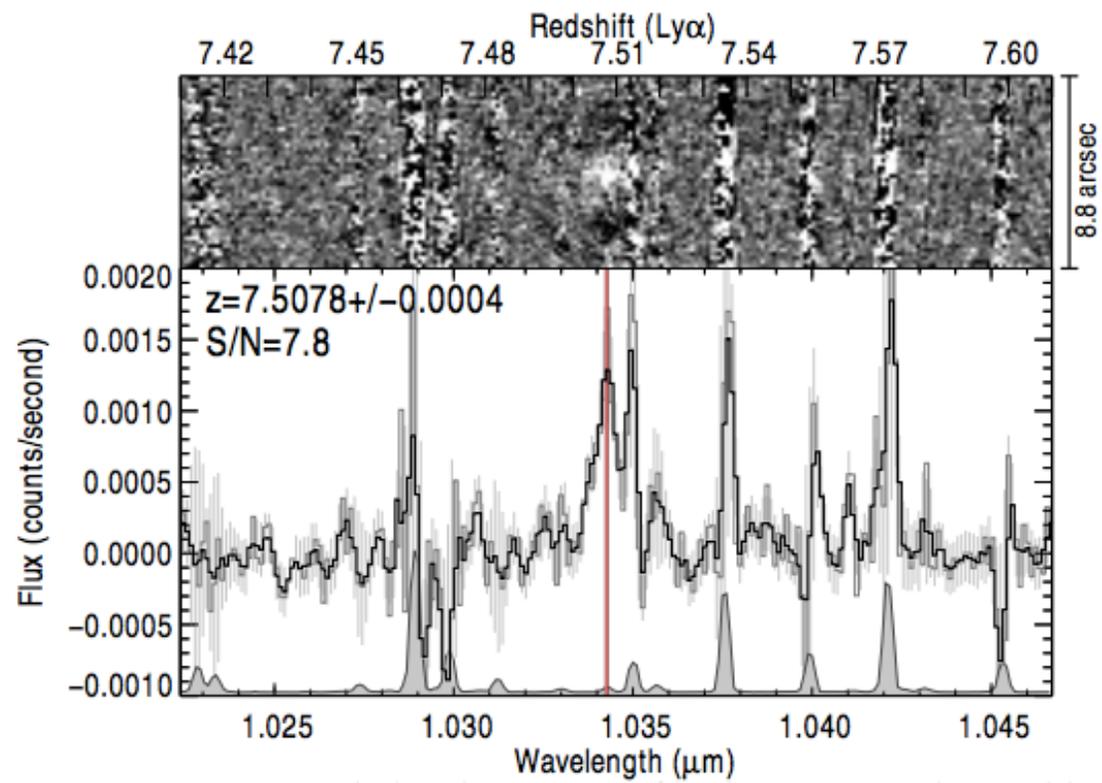
But IRMS works behind AO



IRMS will be
scientifically productive

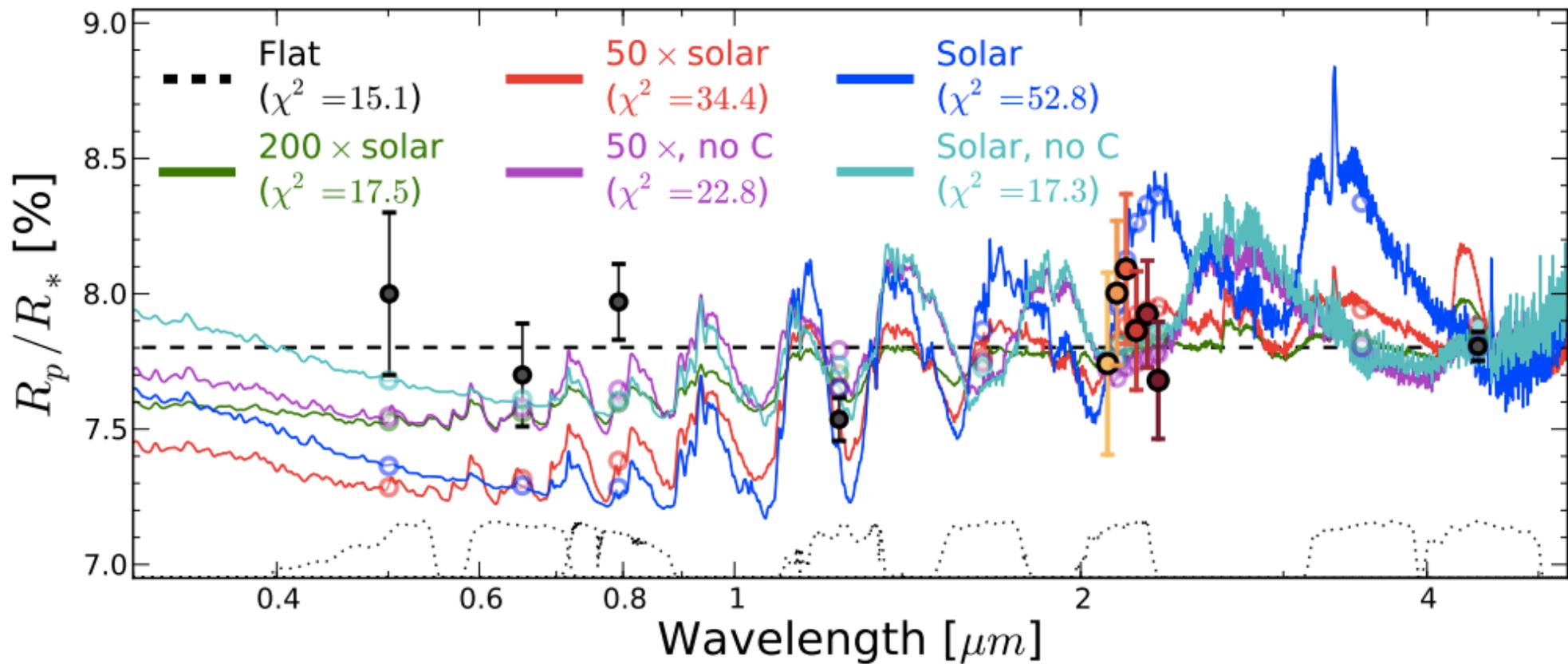
Some unknowns

- Mauna Kea Explorer, PFS followup?
- Astrometric power of IRMS, which takes disproportionate advantage of FWHM compared to MOSFIRE
- Precision [spectro]photometry in crowded fields

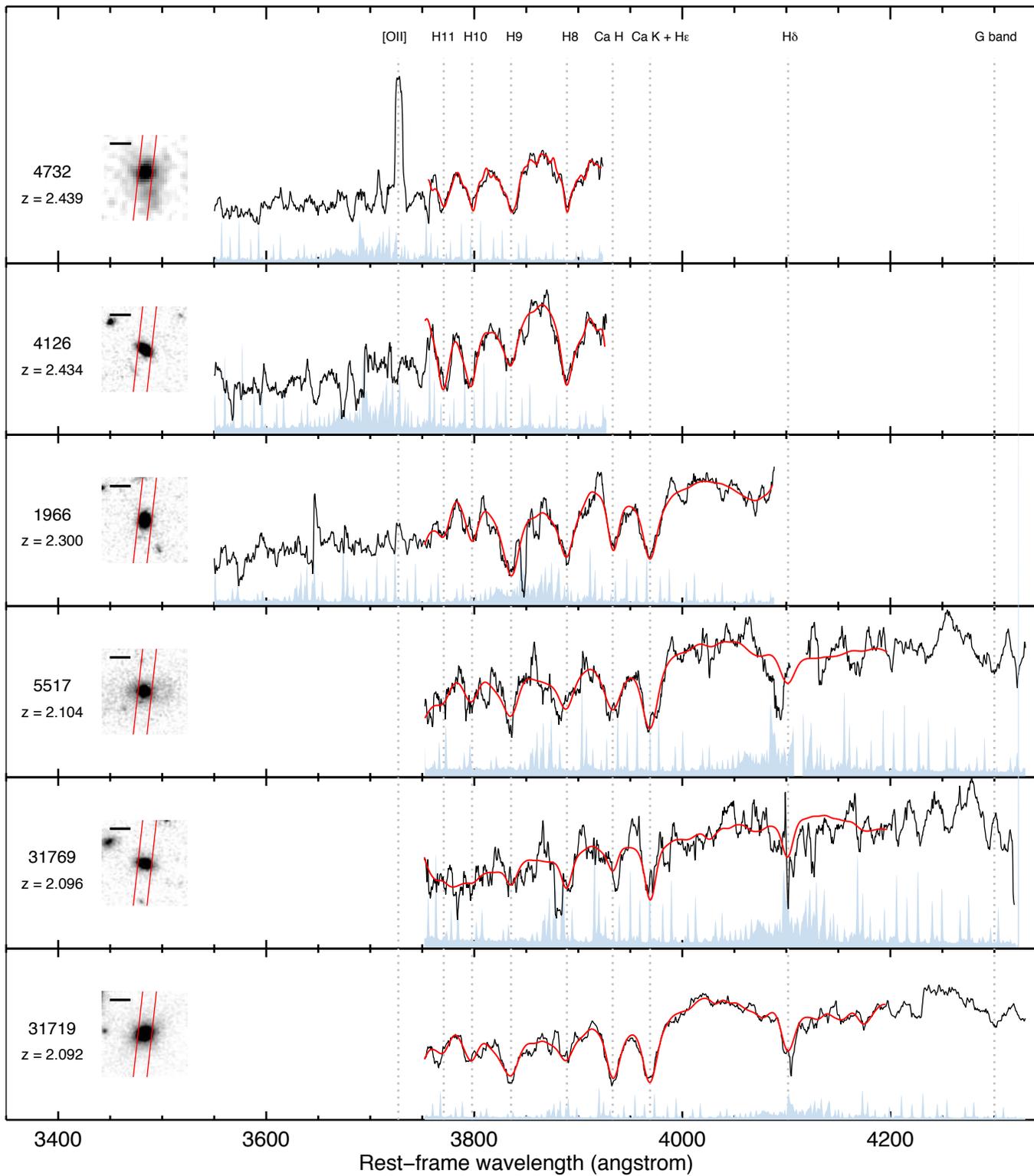


Finkelstein+ (2013)

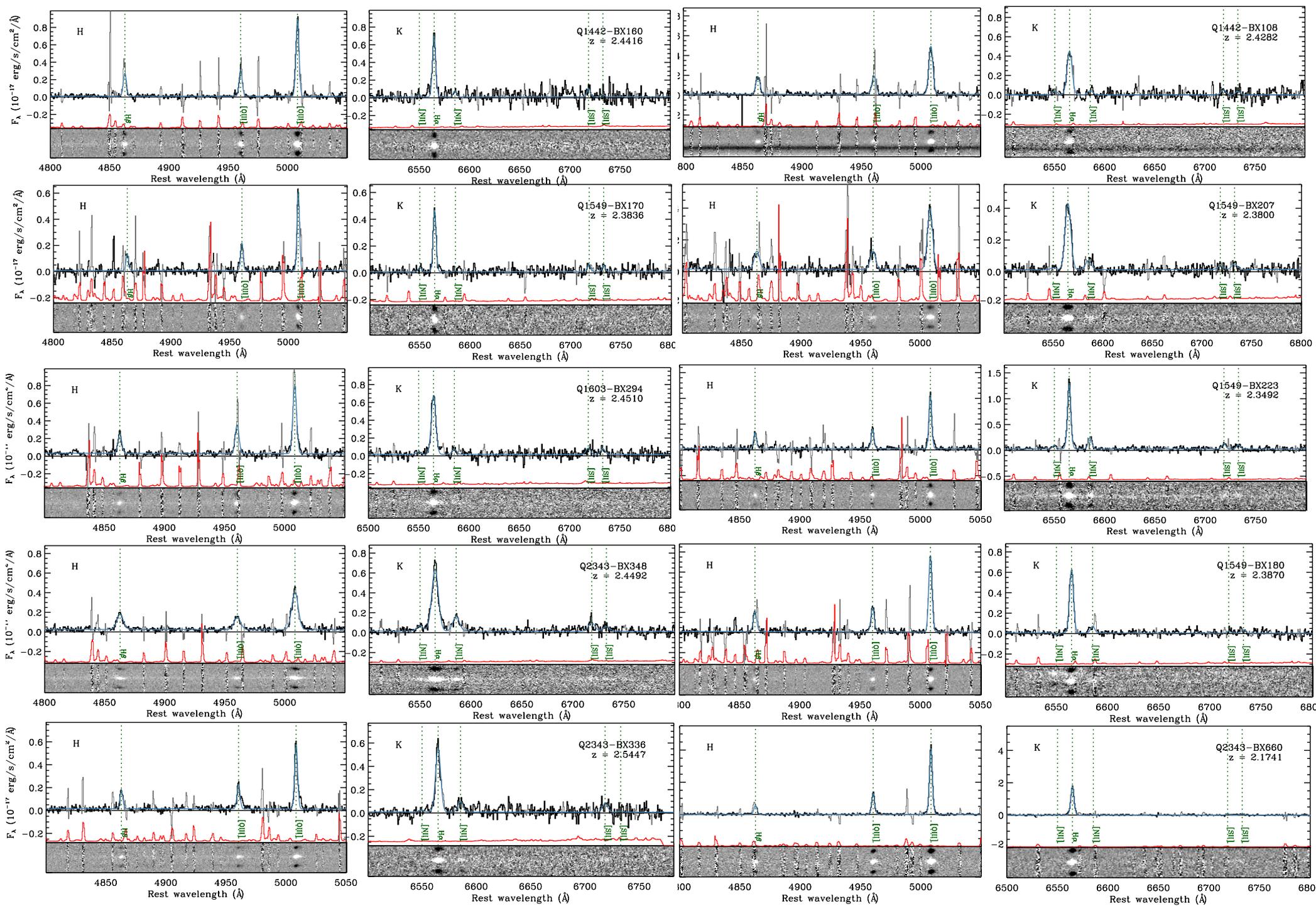
Transmission Spectroscopy of Extrasolar Planets



Crossfield+ (2013)

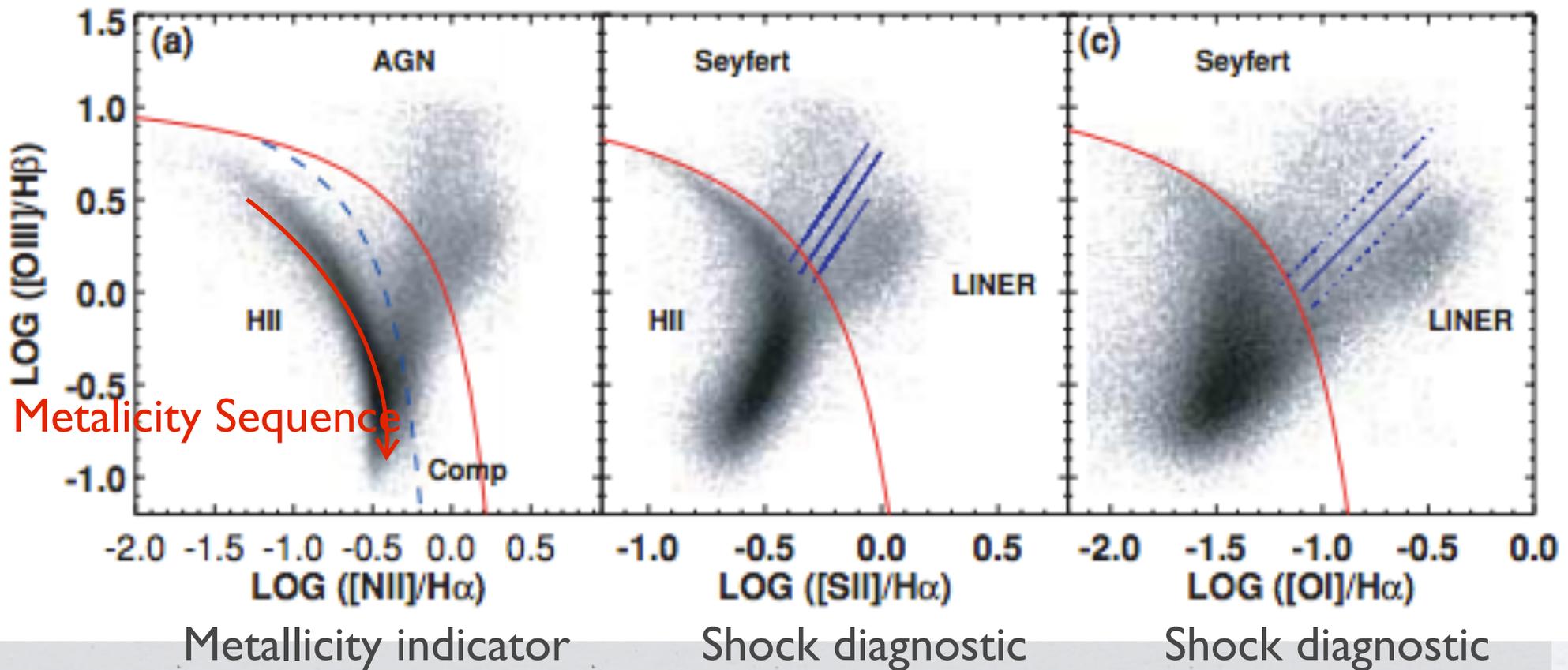


Belli+ (2014)

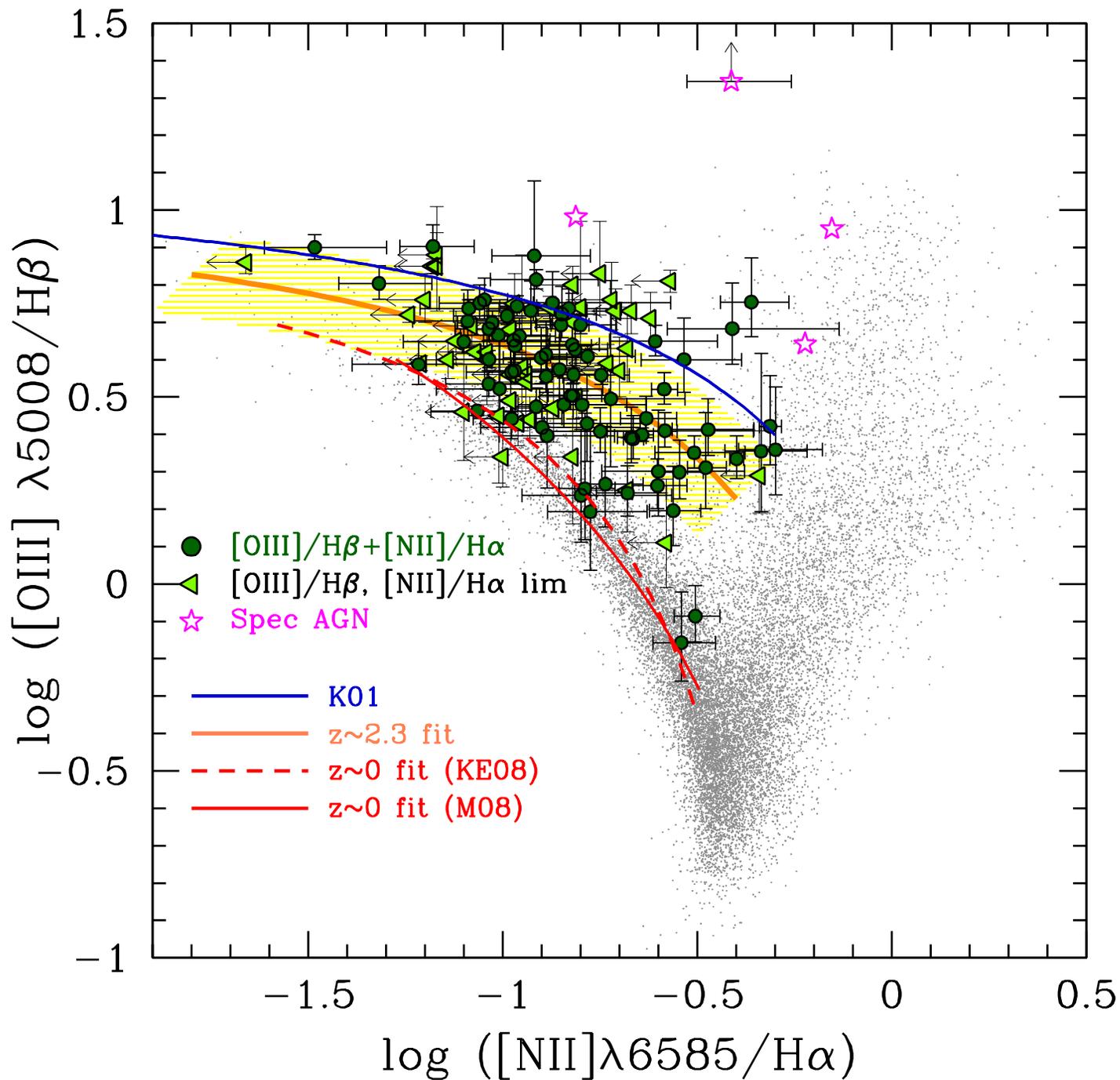


Steidel+ (2014)

Emission line ratios are essential tools: BPT Diagrams



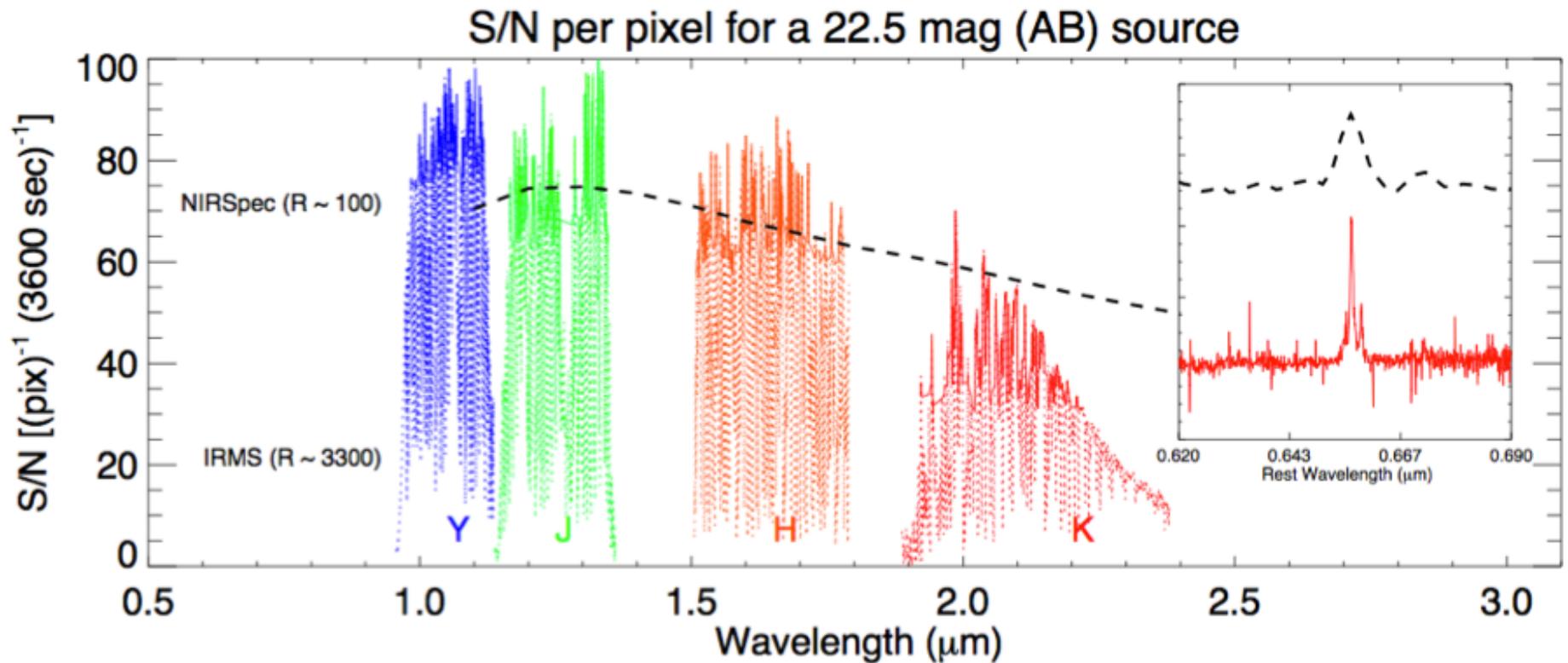
MOSFIRE “BPT” Diagram





The HUDF/IR

JWST/NIRSpec



IRMS Schedule

- Will begin “mini studies” in a few months
- Priority will be adaptive optics
- Input from the science team will be solicited

Come chat

- Come meet to discuss IRMS during lunch today!

Thank you

