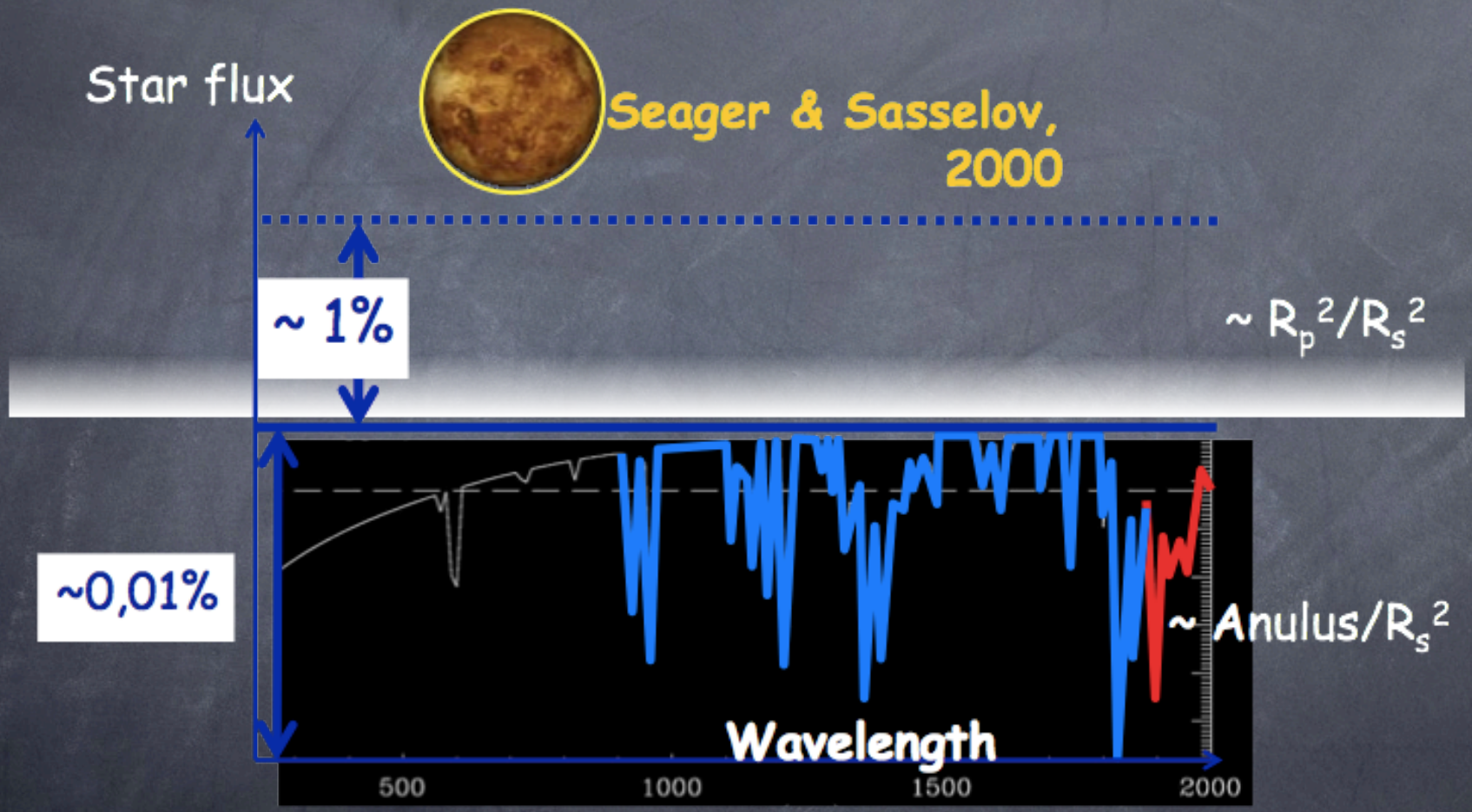
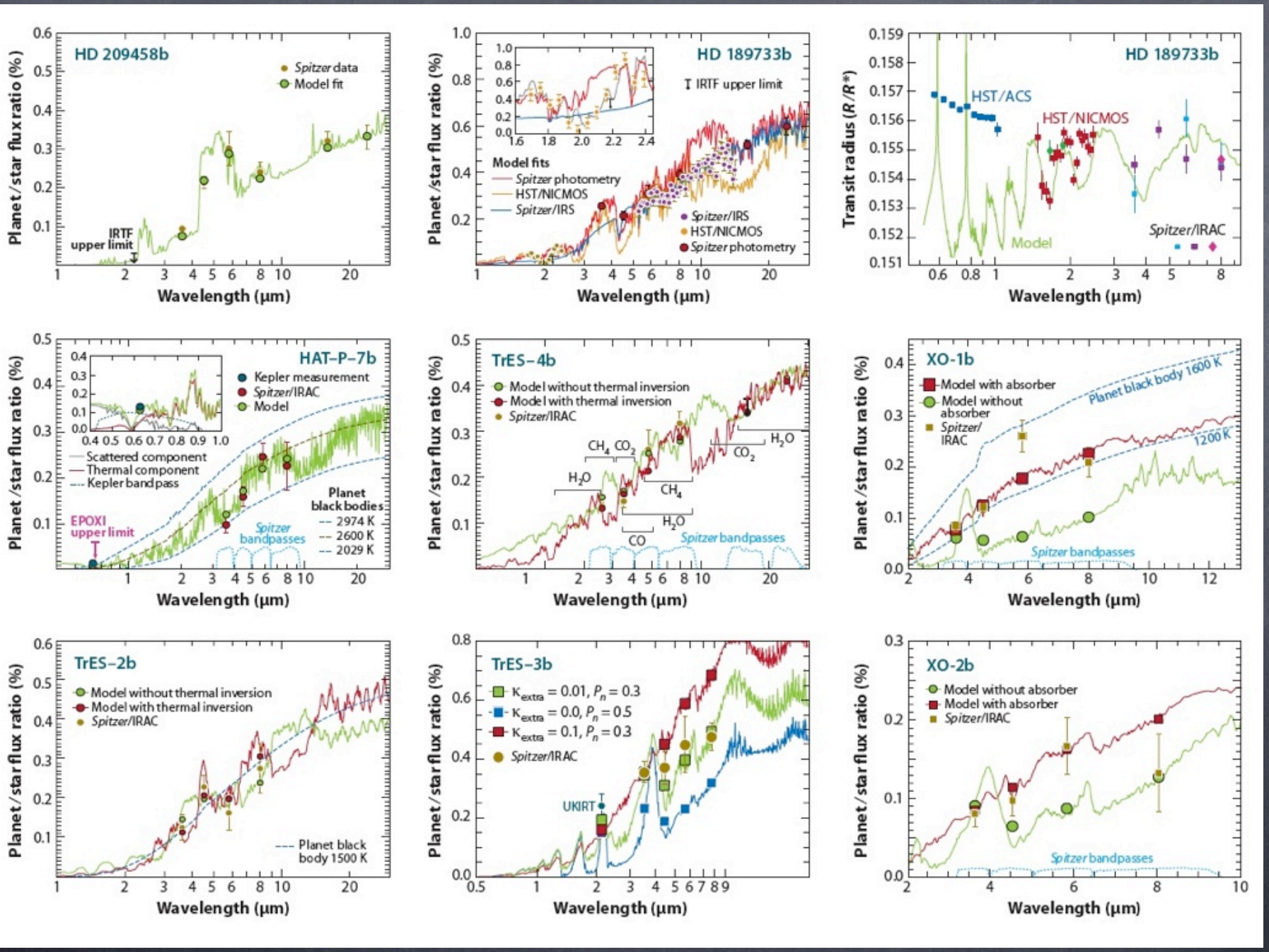
Trasparencies...and spectra

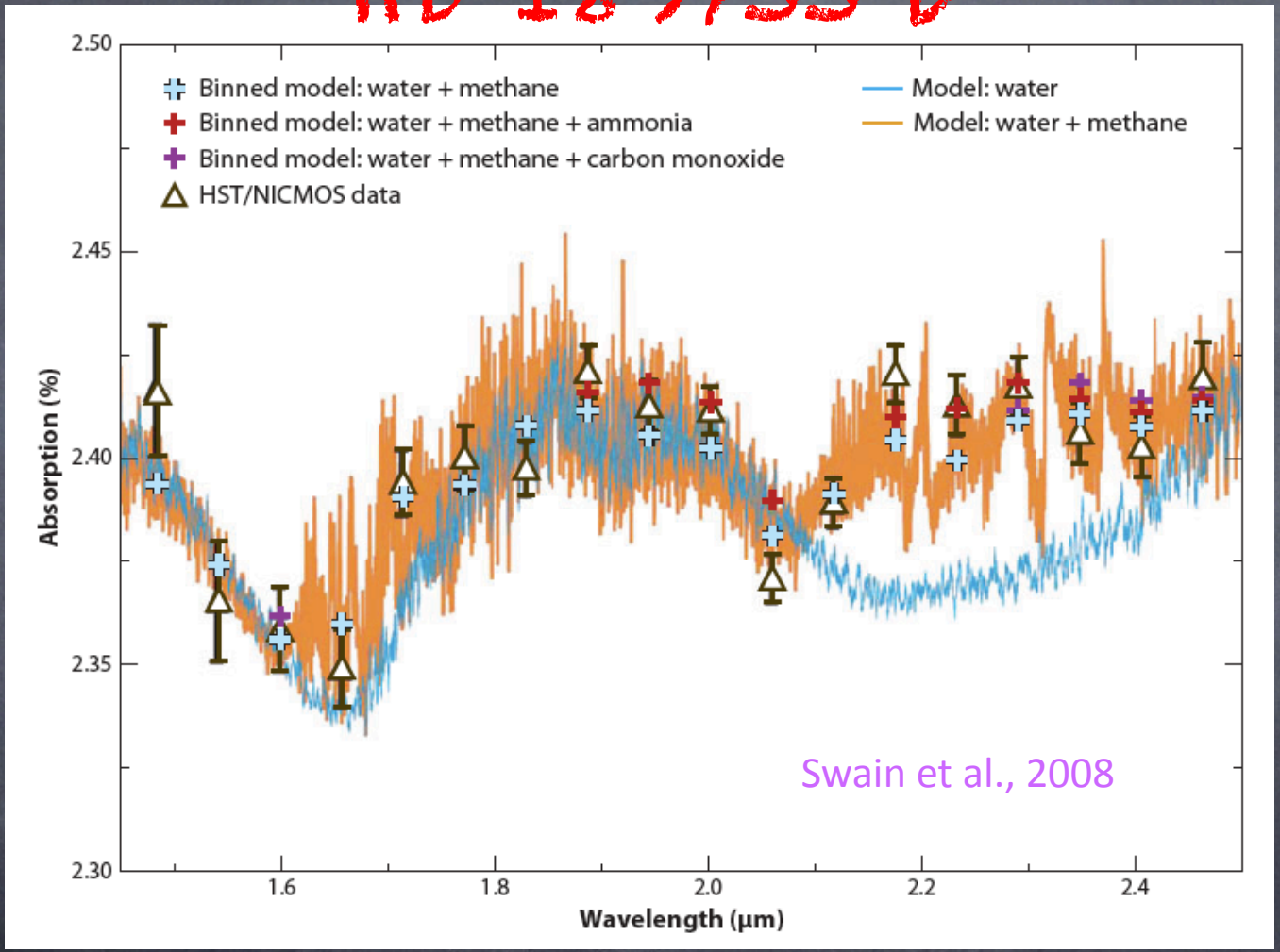




Ref: Seager & Deaming, 2010;

Transmission ...

HD 189733 b



Swain et al., 2008

Occultation

Molecules

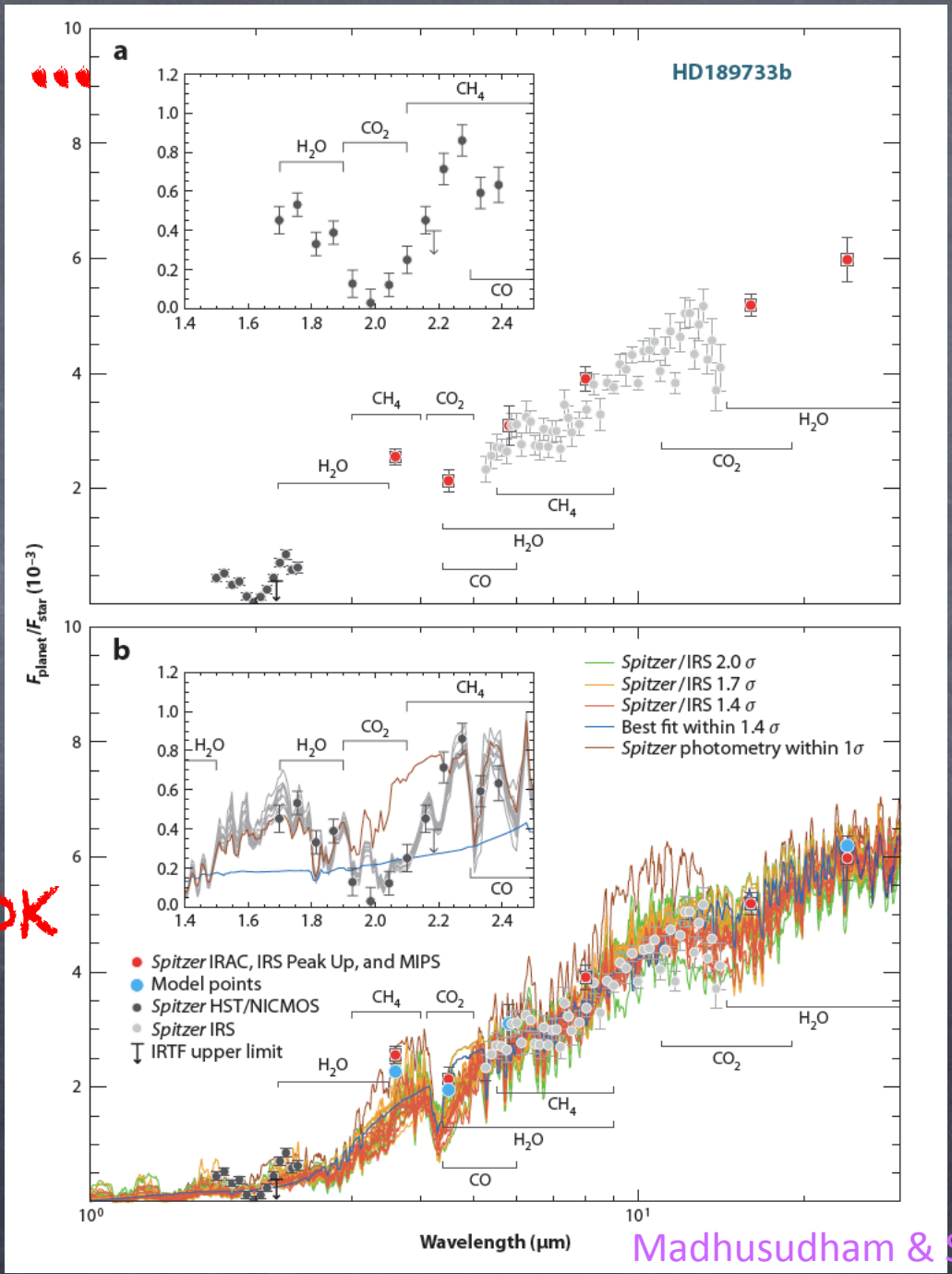
H_2O

CO

CO_2

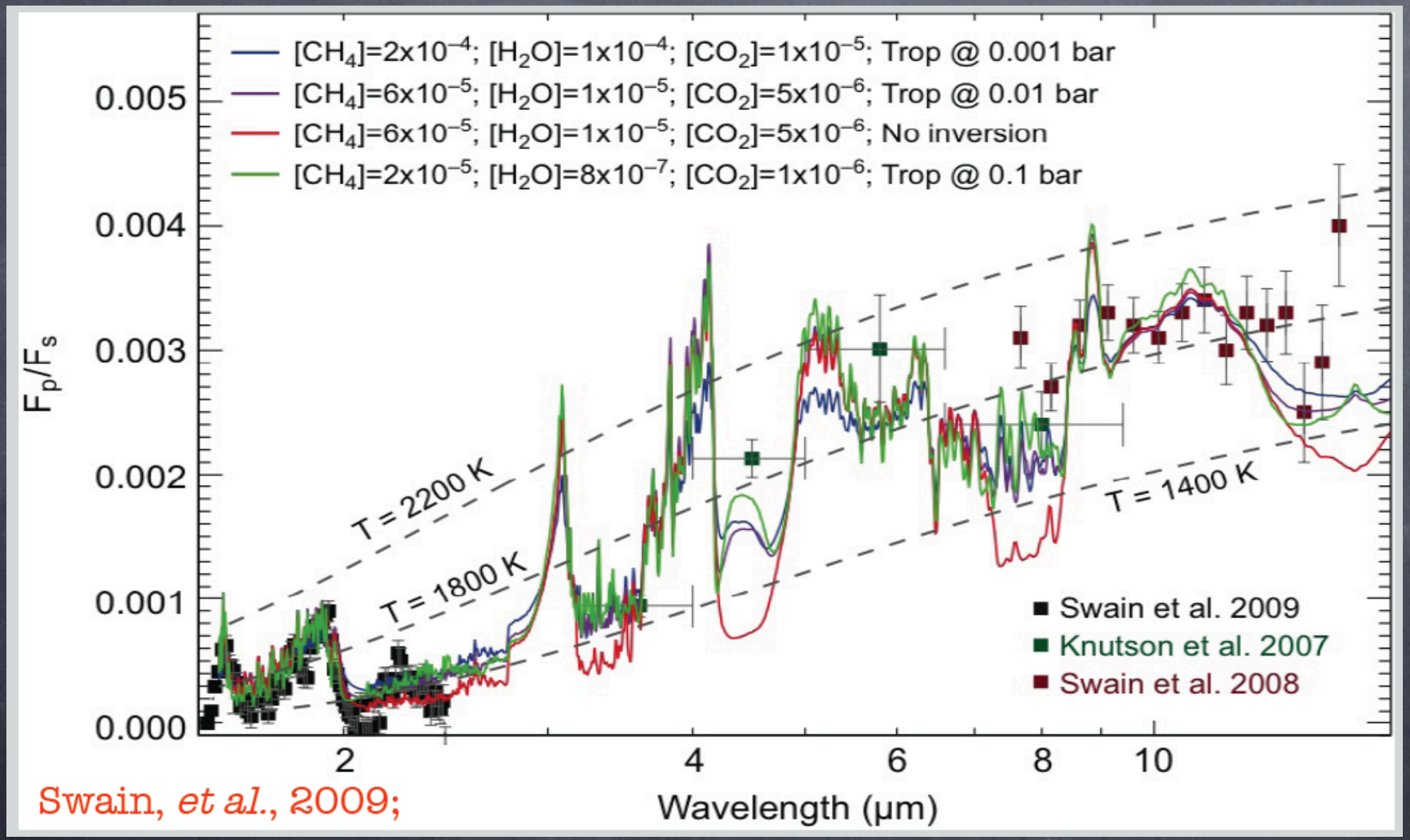
CH_4

$1440 \leq T_{eff} \leq 1540K$



Madhusudham & Seager, 2009

Degenaracy composition-P-T Profile



Swain, *et al.*, 2009;

HD 209458 b

Direct Spectroscopy

Coronographs

High contrast Imaging

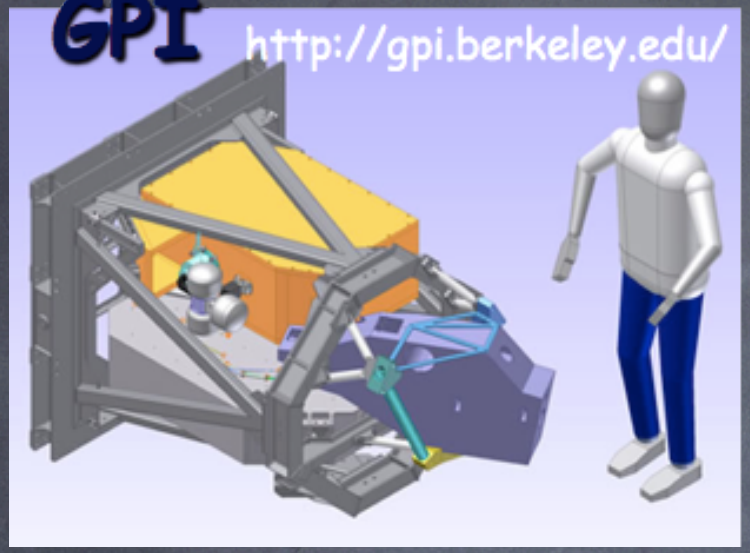
Ground Based and Space based

Non-strongly irradiated EGPs

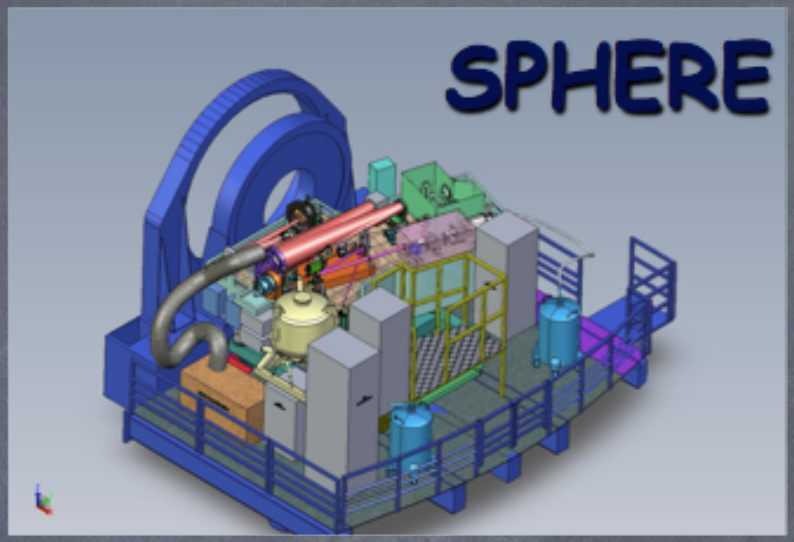
Low-gravity, composition, non-LTE chemistry, cloud coverage...

Janson et al. 10; Bonnefoy et al. 09, 12

Ground based 10m Class



AO+Coronography+IFS
R~45 Δλ: 0.95 -2.20μm
Cryogenic
1st Light 2013



AO+Coronography+IFS
R~45 Δλ: 0.95 -2.20μm
Cryogenic
1st Light 2013

SPHERE Instruments

	ZIMPOL	IRDIS	IFS
FoV	Sq 3.5" (instantaneous) Up to 4" radius (mosaic)	Sq 11"	Sq 1.77"
Spectral Range	0.5 – 0.9 µm	0.95 – 2.32 µm	0.95 – 1.35/1.65 µm
Spectral information	BB, NB	BB, NB Slit spectro: 50/400	50 / 30
Linear Polarisation	Simultaneous on same detector, x 2 arms, exchangeable	Simultaneous dual beam, exchangeable	x

Coronography: no /4Q / Lyot

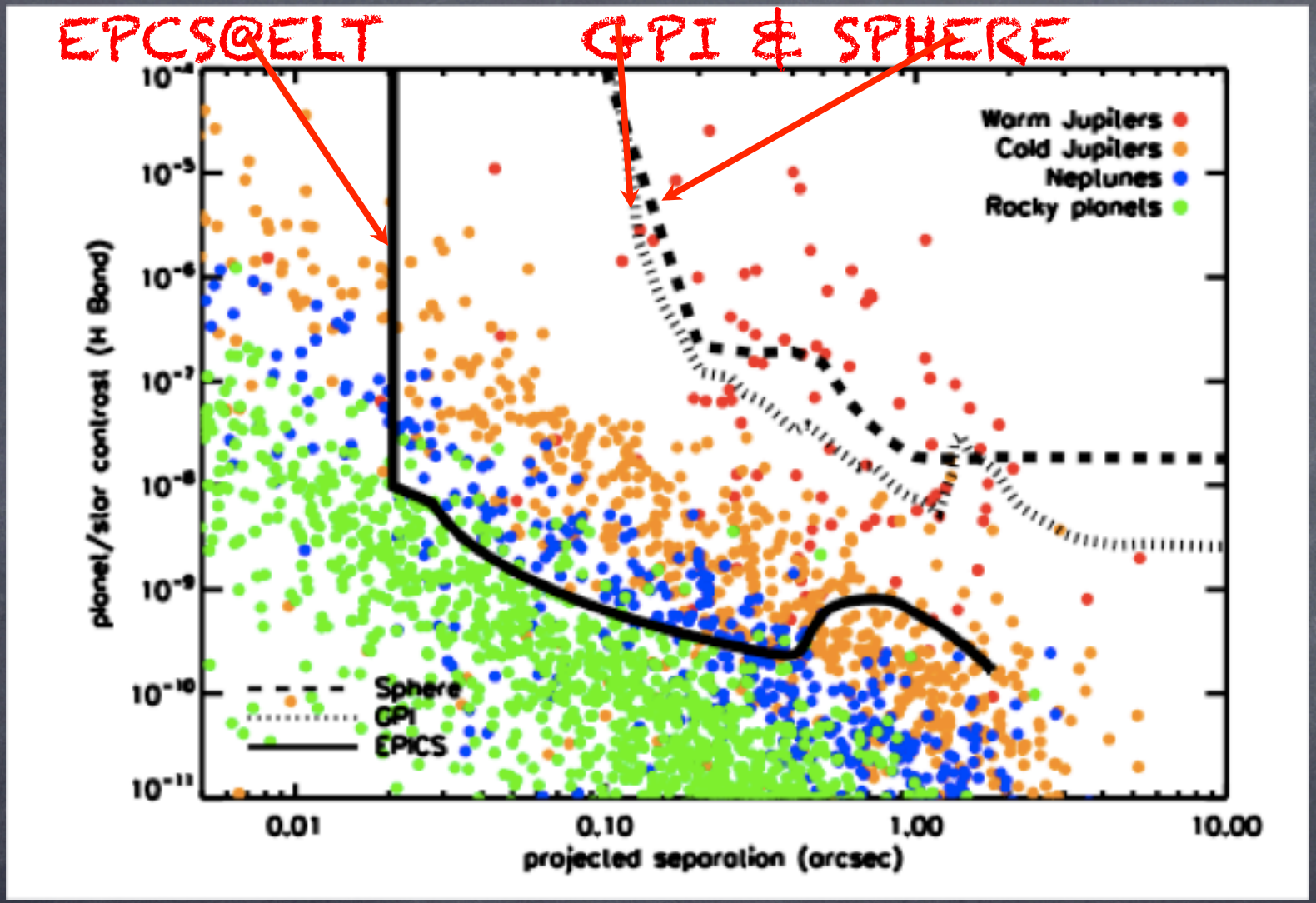
Rotation at Nasmyth:

Pupil-stab. (instrument fixed wrt tel.)
Field-stab (slit spectro, long DIT…)
No rotation: minimize crosstalk…)

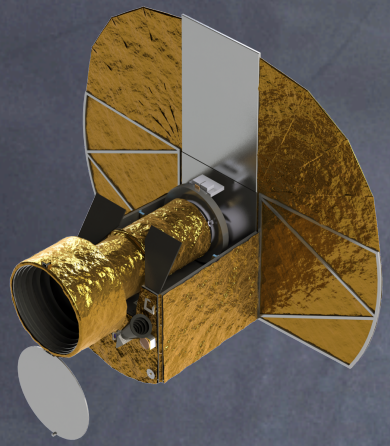
AO sensitivity for high contrast:
R=9.5 for NIR; R=9 for R; R=7.8 for whole VIS

Separation with improved contrast:
2 - 20 λ/D, ie 30-300 mas in R, or 80 – 800 mas in H

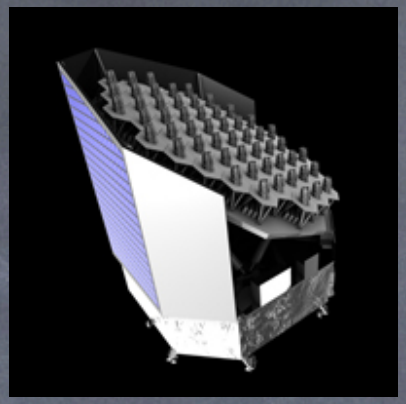
Mode switching: not VIS and NIR in same night


EPCS@ELT
GPI & SPHERE
Worm Jupilers
Cold Jupilers
Neplunes
Rocky pionels
Sphere
GPI
EPICS
planet/star contrast (H Band)
projected separation (arcsec)
0.01
0.10
1.00
10.00

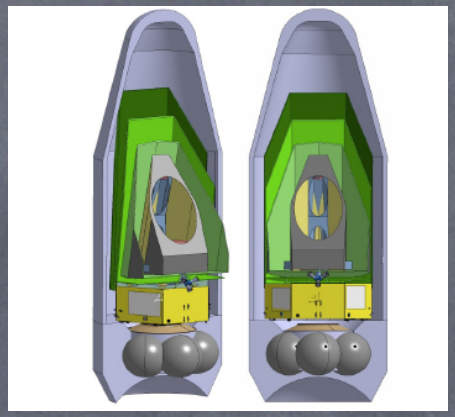
SPACE...



Cheops



PLATO

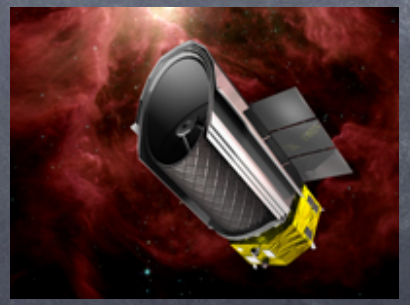


ECHO

Dedicated

General

JWST



SPICA