

Ongoing research with potential S-T interactions

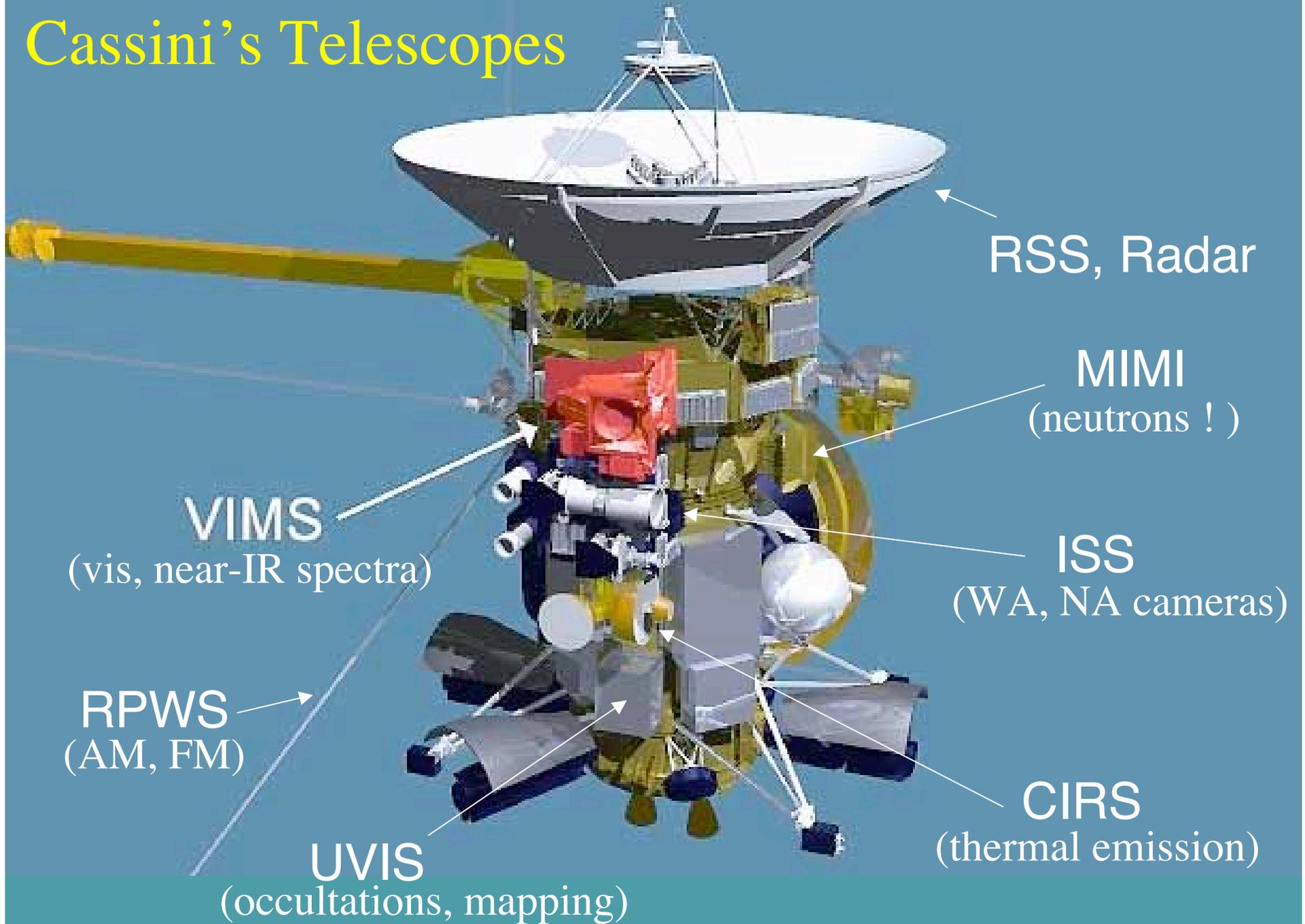
Jeff Cuzzi, SST

Cassini: rich data set, complex targets, multi-wavelength;
multiple instruments, formats, observing geometries;
Saturn's rings my focus; other SS experts on other topics

Protoplanetary nebula modeling;
fluid dynamics; production/dissipation of turbulence;
particle-gas dynamics; gas and grain surface chemistry;
giant planet envelope formation

Adaptive optics: pilot study in late 90s
UCSC Center of Excellence in Adaptive Optics
Ongoing collaboration w/ SAO -Wyoming
Mainly groundbased applications

Cassini's Telescopes



Cassini will return 100-1000x the data of Galileo, but
Project teams are not staffed or equipped to handle it

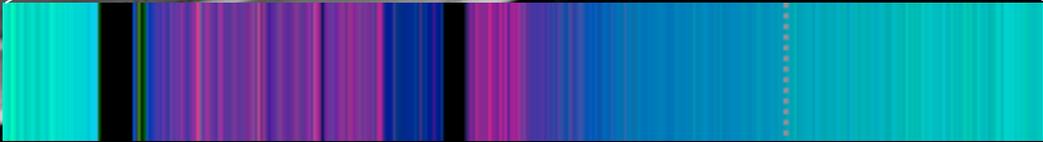
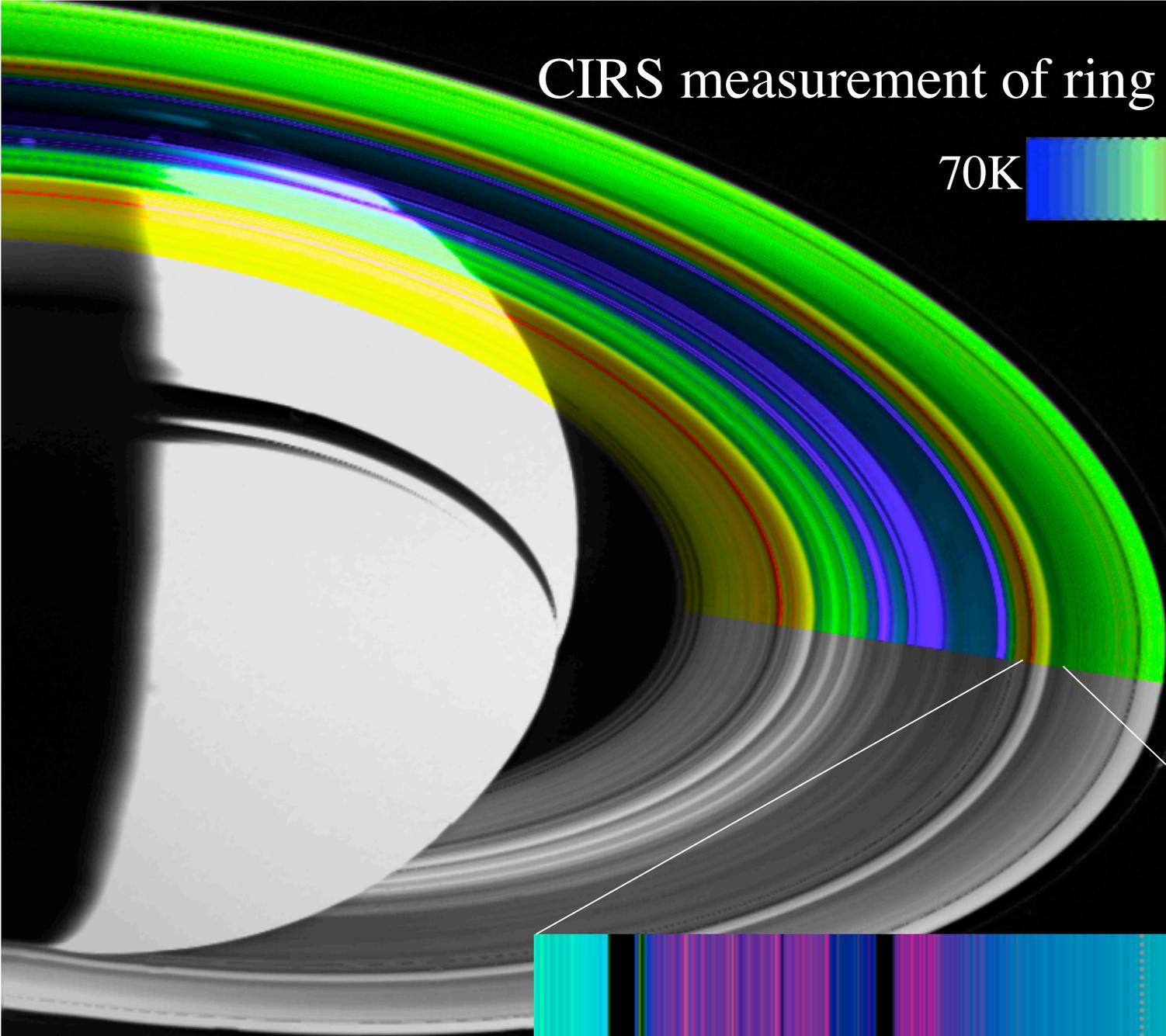
Data Analysis Program (DAP) MAYBE available late FY06

Possible opportunities for Ames proposals:

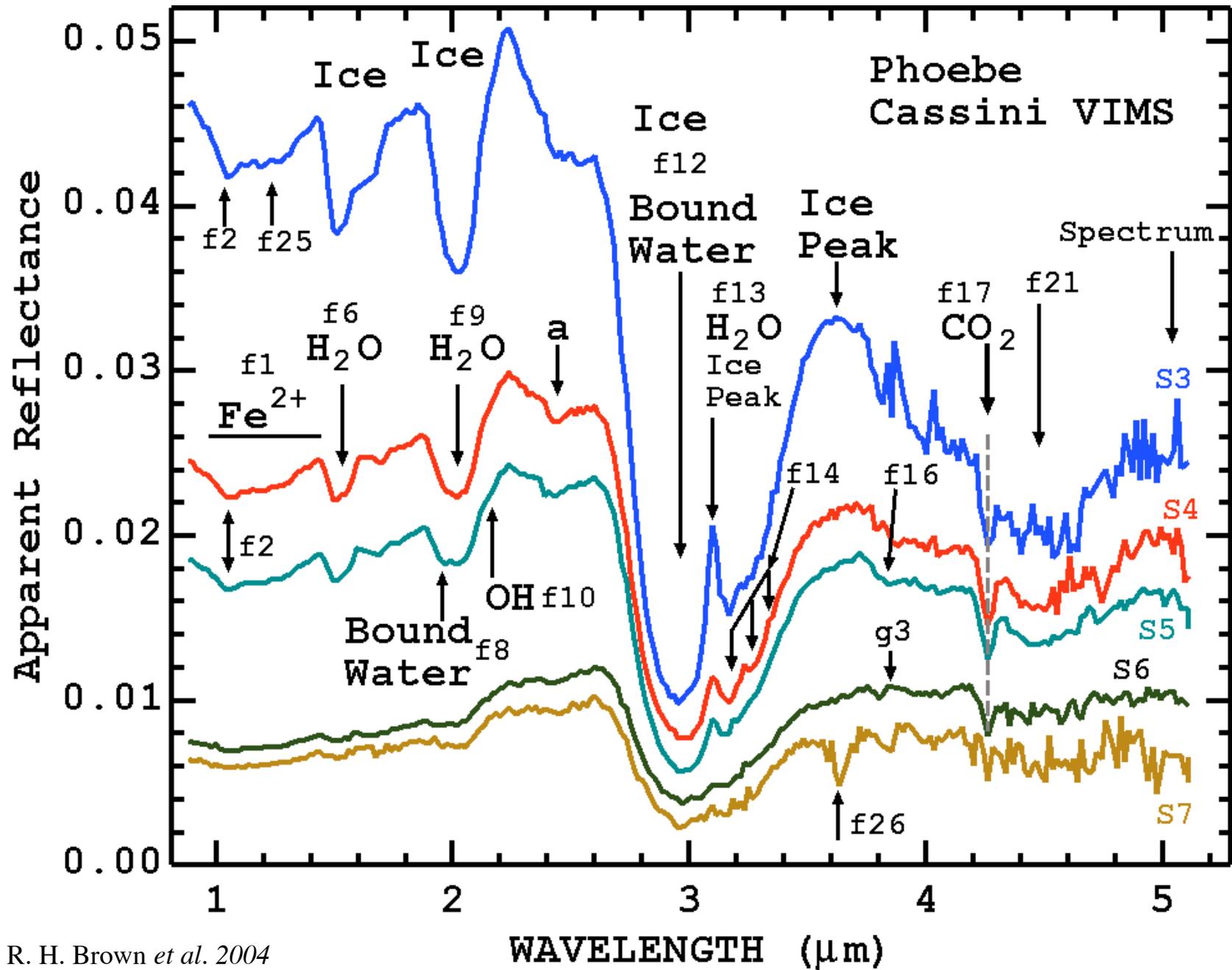
Ring and satellite spectral properties;
principal component analysis
Spatial variation of principal components
example: HST and VGR color-color work

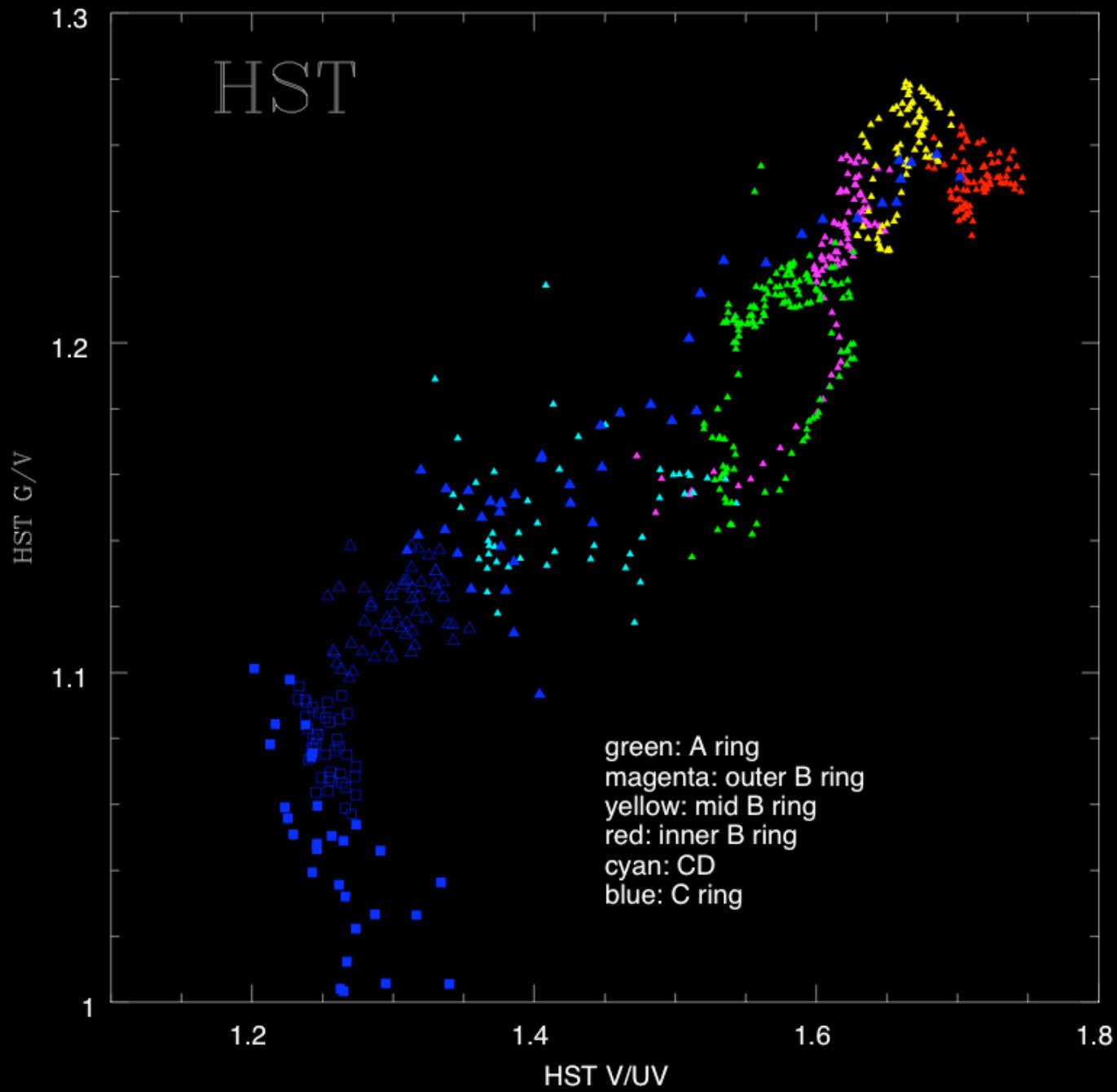
Titan descent imager: global 3D map-model-object
a la MERMAP?

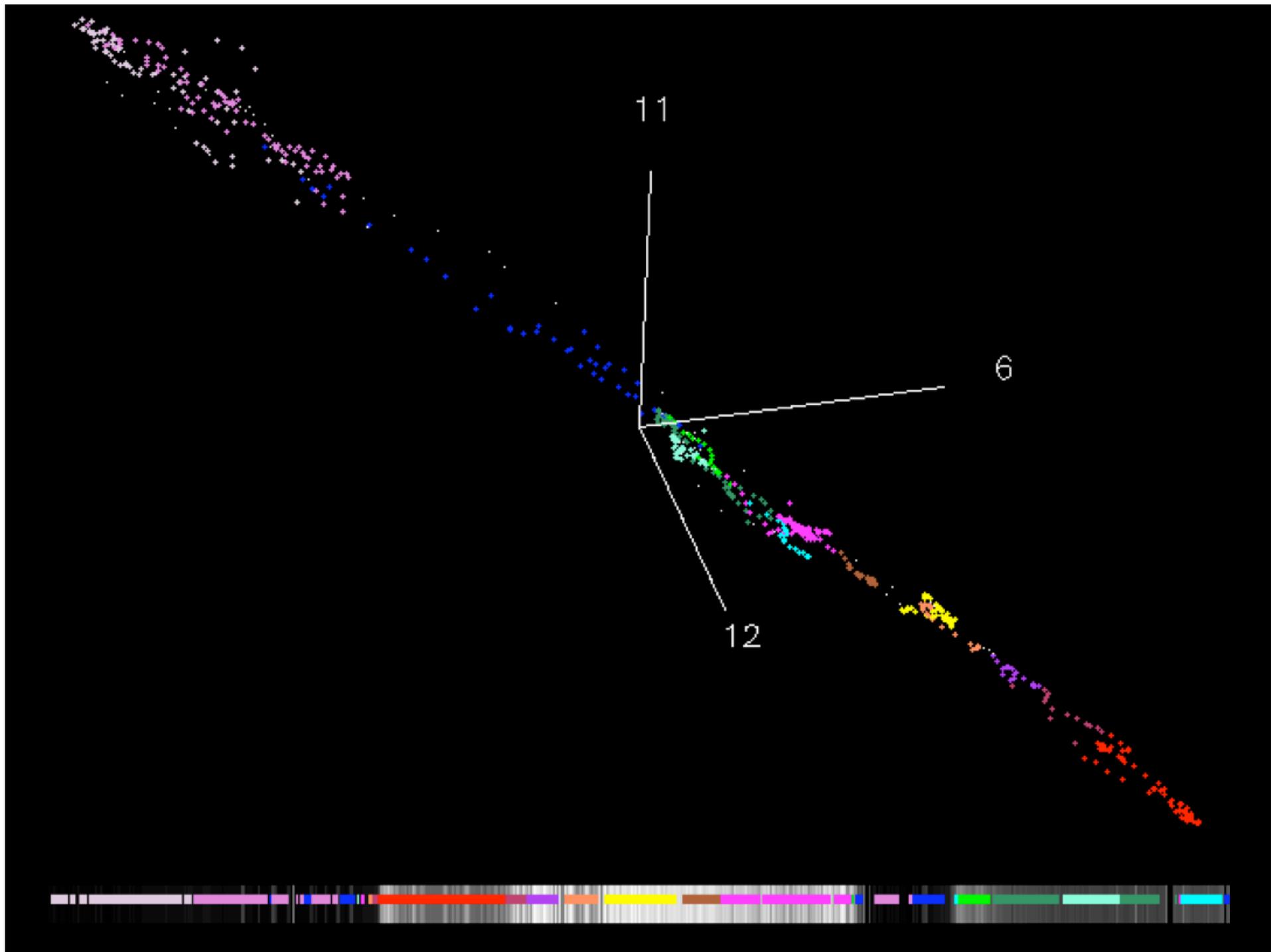
CIRS measurement of ring temperatures

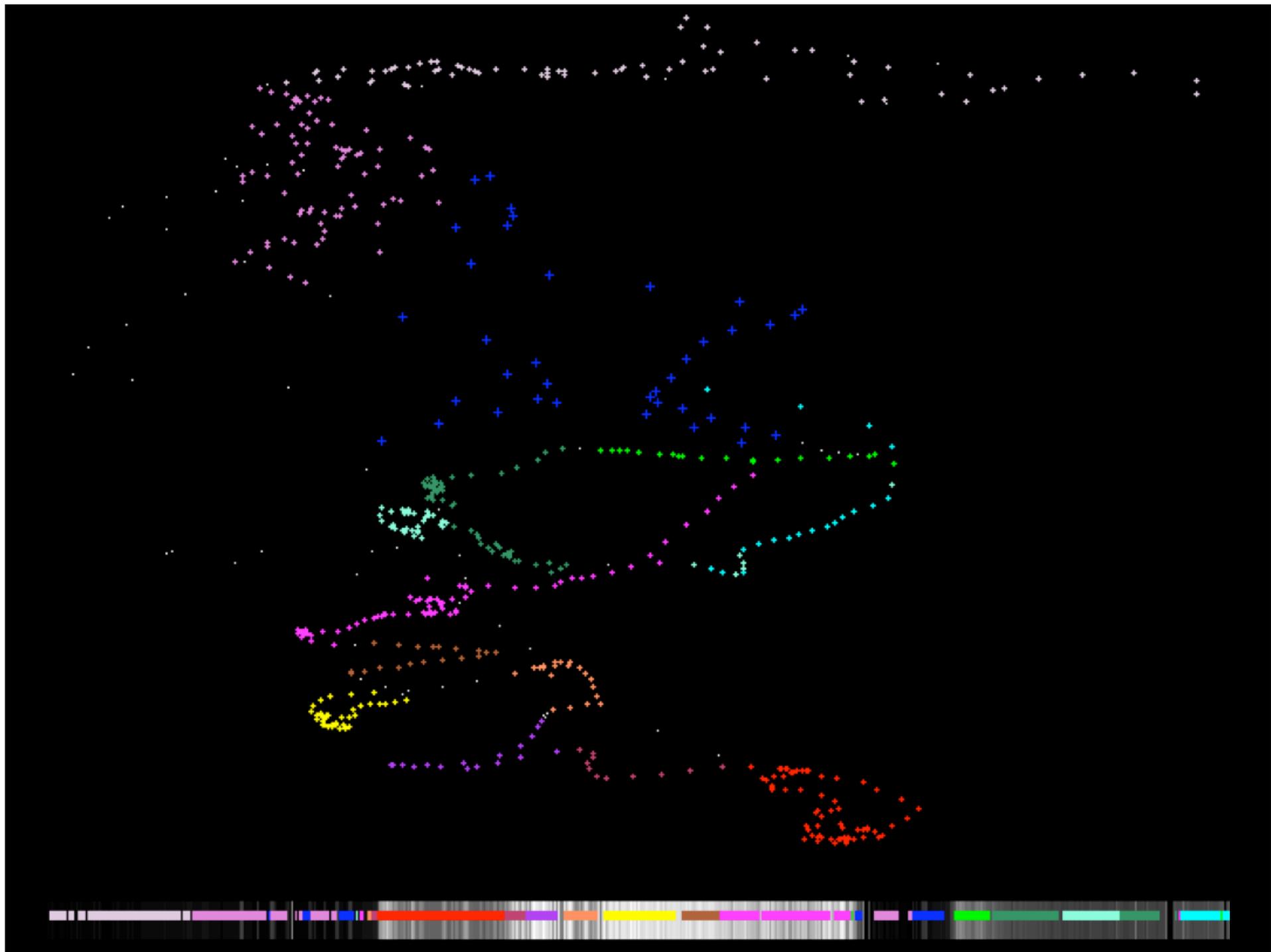


VIMS - composition



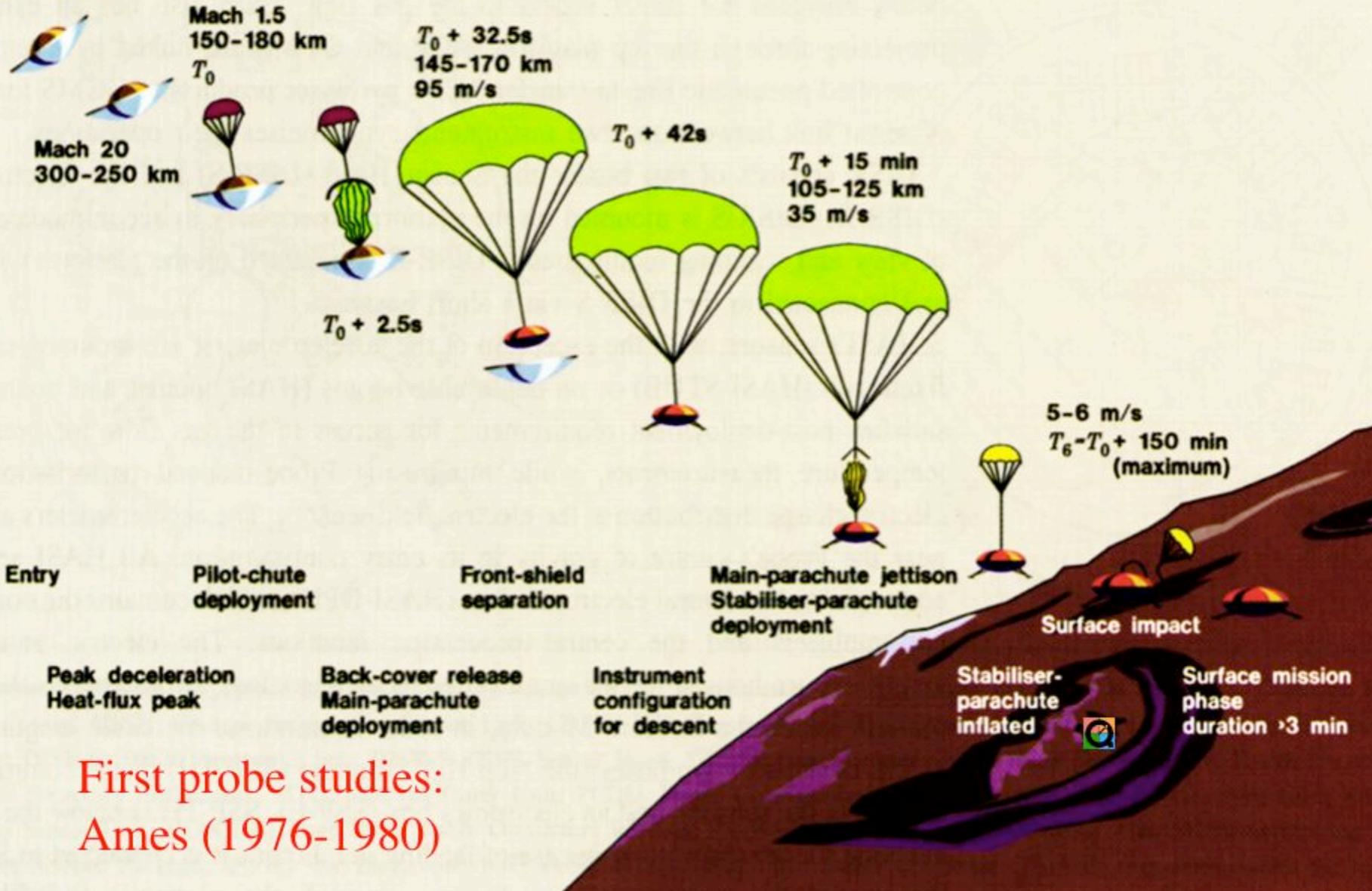






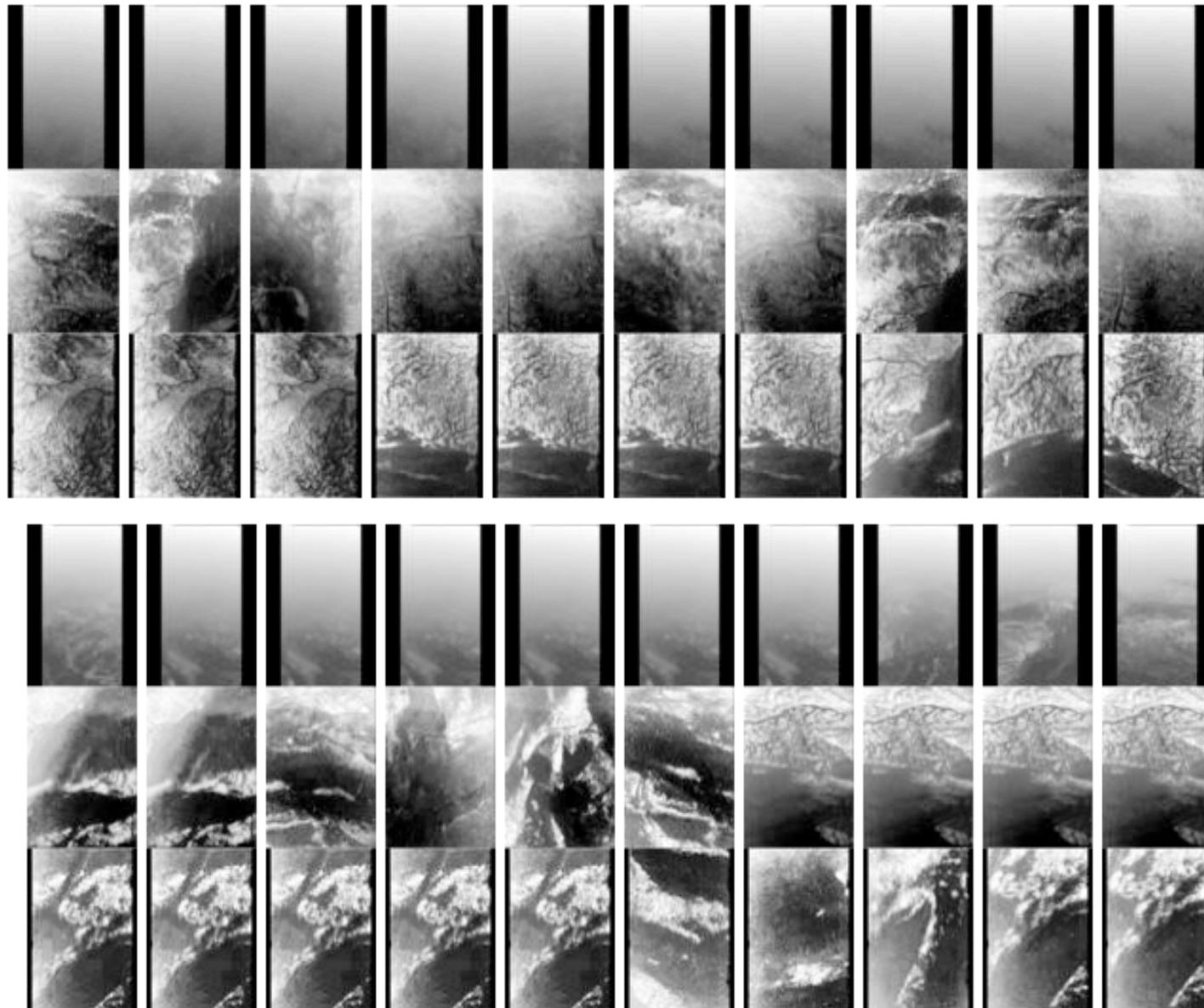
Huygens probe - 2 hr descent time

1270 km
above surface



First probe studies:
Ames (1976-1980)

Raw images from the Huygens probe descent on 14 January 2005
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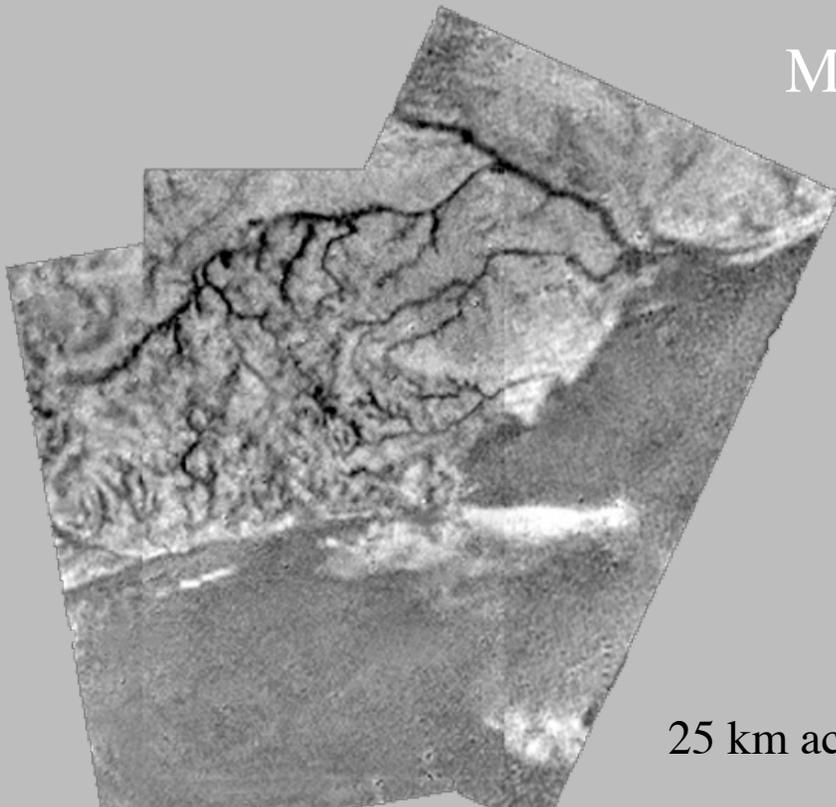


Descent imager DISR

50 km across

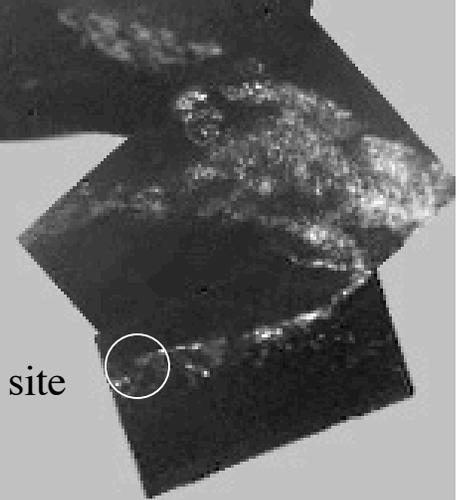


Methane rivers,
tarry silt

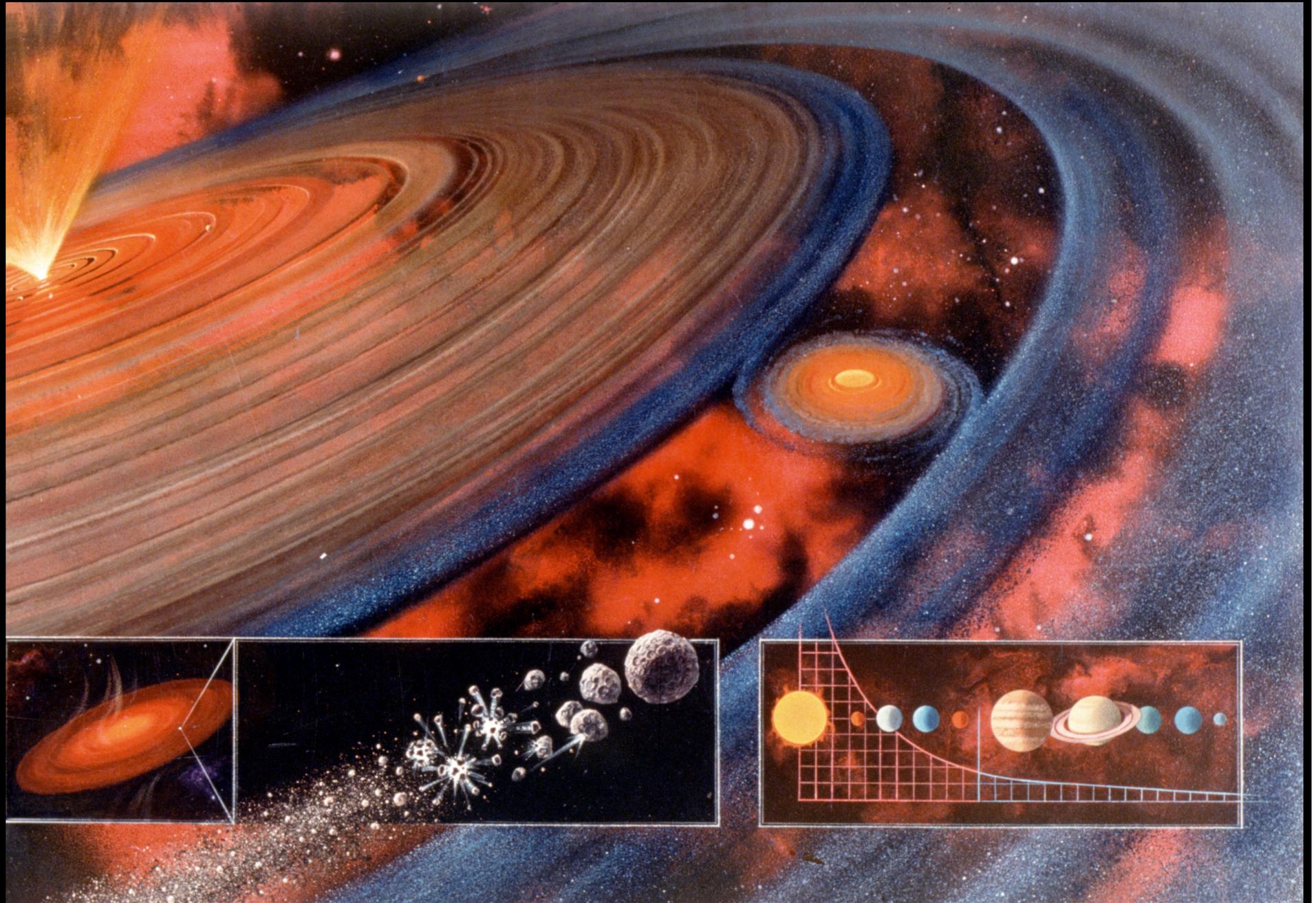


25 km across

Landing site



20 m resolution



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Protoplanetary Nebula Modeling

Large, 2D and 3D fluids codes; DNS, compressibility

Gas phase and grain surface (catalytic) chemistry

Coagulation of interacting dense, particle-rich clumps

Collapse of gas giant envelope; dredging up of core?

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