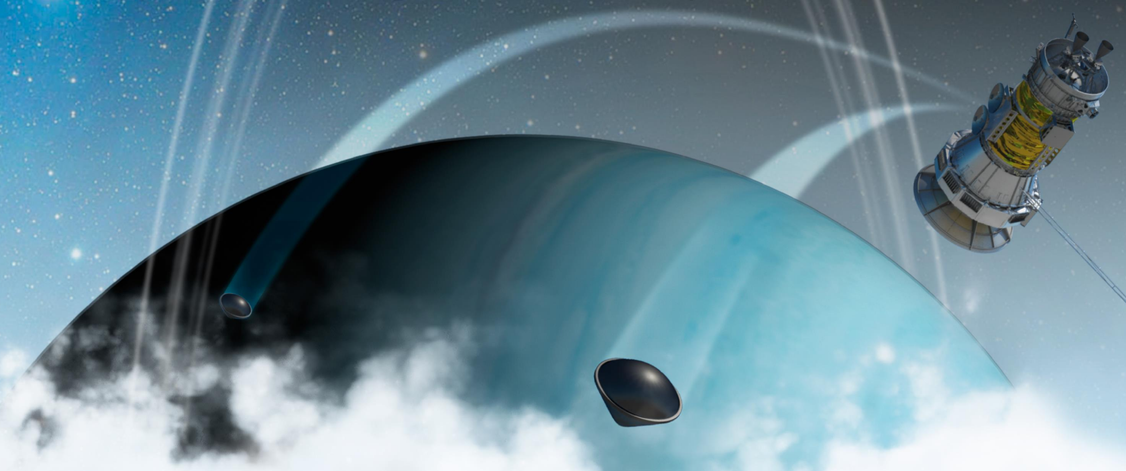
SNAP

Small Next-generation Atmospheric Probe



SNAP: Small Next-generation Atmospheric Probe Concept

+ Can be added to a mission to a giant planet
+ Reduces cost of in-situ atmospheric measurements
+ Enables in-situ exploration at multiple sites
+ Enhances science return of the host mission with small cost
+ Pushes the state-of-the-art for small atmospheric probe technologies
+ Defines the next generation of atmospheric probes

Compelling Scientific Objectives

The objectives are from the 2013 Planetary Science Decadal Survey

Tier 1
- Determine vertical distribution of cloud-forming molecules
- Determine thermal stratification
- Determine wind speed as a function of depth

Tier 2
- Measure abundances of the noble gases (He, Ne, Ar)
- Measure isotopic ratios of H, C, N, and S

The SNAP Team

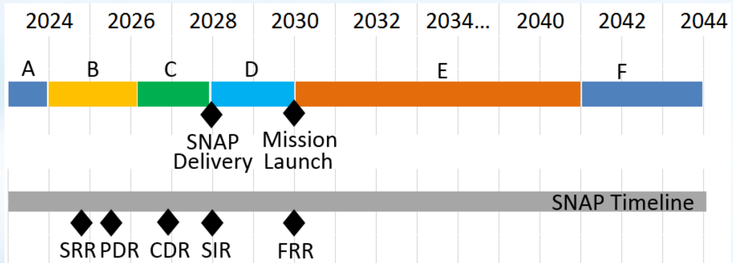
Kunio Sayanagi, PI, Hampton University
Robert Dillman, Lead Engineer Co-I, LaRC
David Atkinson, Science Co-I, JPL
Amy Simon, Science Co-I, GSFC
Michael H. Wong, Science Co-I, UC Berkeley
Tom Spilker, Mission Architecture Co-I
Sarag Saikia, Mission Architecture Co-I, Purdue University
Jing Li, Science Collaborator, NASA Ames
NASA Langley Research Center Engineering Design Studio

SNAP Mission Overview

Add SNAP to Uranus Orbiter and Probe Mission
Orbiter delivers Main Probe and SNAP to Uranus

+ Probes enter summer & winter hemispheres
+ Parachute Descent
+ Detect Seasonal Difference
+ Sample Two Cloud Layers
+ Send data to Orbiter
+ Orbiter relays data to Earth

Notional Mission Schedule



Mission schedule is notional and it will be updated based on the study results

Anticipated Payload

Atmospheric Structure Instrument: Measure stratification

NanoChem: Detect cloud-forming molecules

Ultra-Stable Oscillator: Measure wind speeds

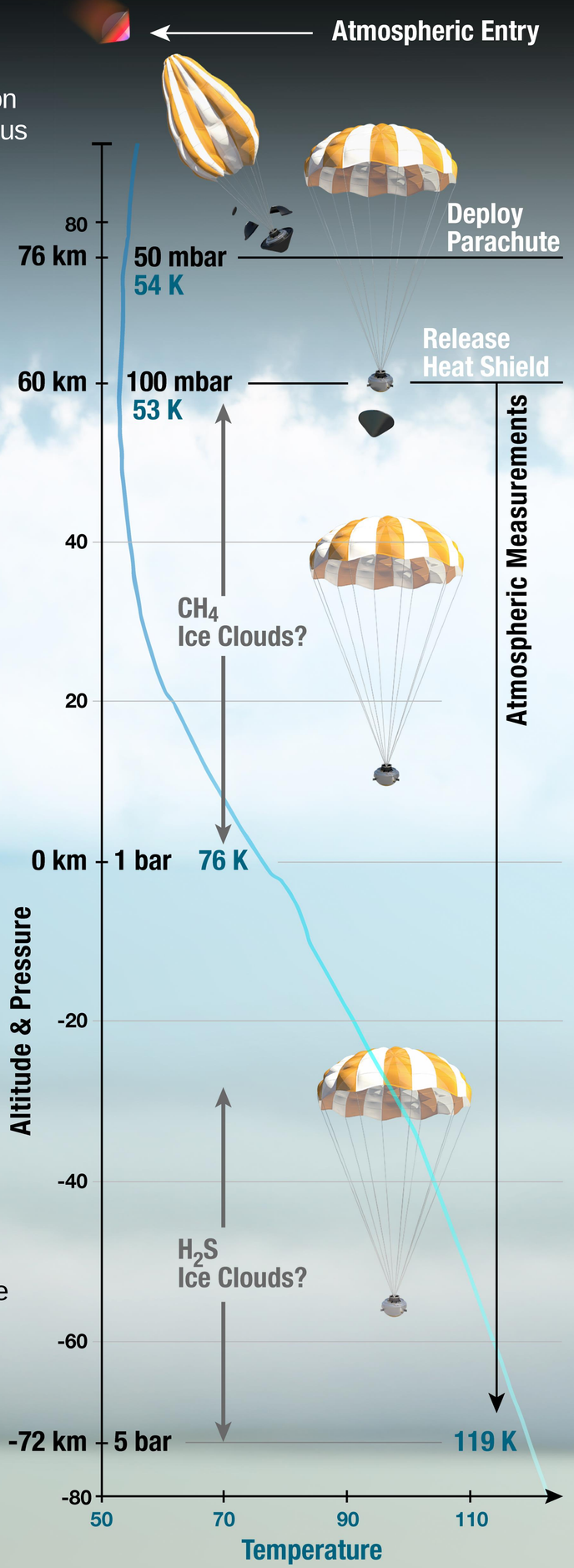
Additional payload studies: Helium Abundance Detector, Mass Spectrometer for isotopic ratios

Relevance, Importance to PSD Science and Science Plan

SNAP Science Objectives are highly relevant to PSD Science Goals and 2014 NASA Science Plan:

+ Formation and Evolution of Uranus
+ Chemical and Physical Processes in Uranus
+ Role of Giant Planets in Origin and Evolution of Life on Earth

SNAP Science Operations



HAMPTON UNIVERSITY · NASA Langley · PURDUE UNIVERSITY · NASA Goddard · JPL · Ames Research Center · UNIVERSITY OF CALIFORNIA BERKELEY 1868