Ice Giant Mission Study Status

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OPAG, San Antonio, Texas

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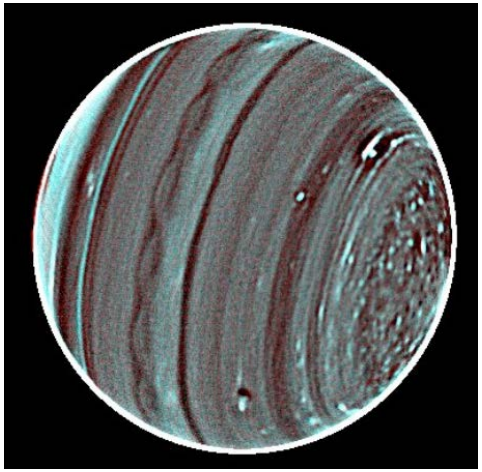
Neptune and Triton from Voyager



Ground-Based Image of Uranus. Sromovsky et al. 2012

Outline

- Goals and Objectives
- Study Ground Rules
- Activities for 2016
- SDT Members
- Voyager Anniversary
- Discussion

Goals & Objectives

- Goal: Assess science priorities and affordable mission concepts & options in preparation for the next Decadal Survey
- Objectives:
  - Identify mission concepts that can address science priorities based on what has been learned since the 2013-2022 Decadal
  - Identify potential concepts across a spectrum of price points
  - Identify enabling/enhancing technologies
  - Assess capabilities afforded by SLS

Ground-Rules Highlights (1/2)

- Science objectives based on 2013-2022 Decadal Survey, revised for developments in science and technology.
- Study to address both Uranus and Neptune systems.
- Identify missions at a range of costs up to $2B (FY15$).
- Perform an independent cost assessment *and reconciliation.*
- Identify model payload for each candidate mission. Also identify instruments not in the payload that address science objectives.

Ground-Rules Highlights (2/2)

- Identify clean-interface roles for international partnerships.
- Launch dates from 2024 to 2037.
- Evaluate use of realistic emerging enabling technologies.
- Identify benefits/cost savings if SLS were available.

2016 Activities

- Completed items:
  - Announcement of study: OPAG Aug 2015.
  - Begin trajectory work: September 2015.
  - Request for applications to SDT: 13 November 2015.
  - Applications due: 31 December 2015.
  - SDT selection announced: OPAG Feb 2016.
- Develop prioritized science objectives (~February).
- A-Team study (~March).
- From A-Team study, identify 3 to 6 mission architectures for further study (~April).
- Team-X point designs (~spring to summer).
- Community discussion/input at OPAG, LPSC, EGU, DPS.
- Report to HQ (September).

SDT Members

Chairs: Mark Hofstadter (JPL), Amy Simon (Goddard)

Sushil Atreya (Univ. Mich.)

Donald Banfield (Cornell)

Jonathan Fortney (UCSC)

Alexander Hayes (Cornell)

Matthew Hedman (Univ. Idaho)

George Hospodarsky (Univ. Iowa)

Kathleen Mandt (SwRI)

Mark Showalter (SETI Inst.)

Krista Soderlund (Univ. Texas)

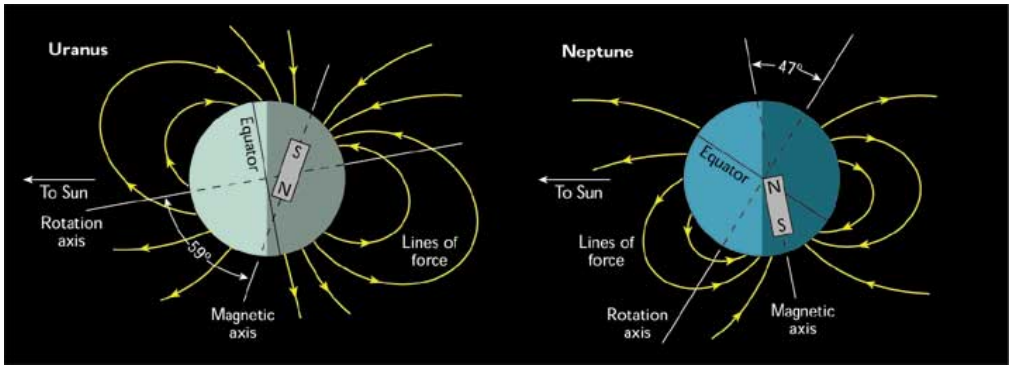
Elizabeth Turtle (APL)

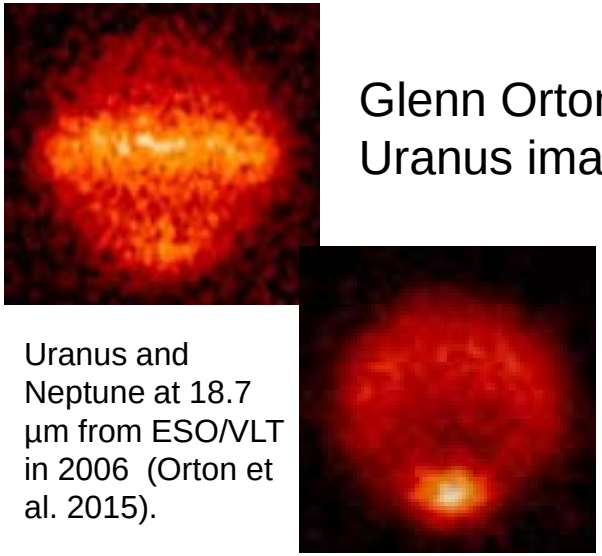
ESA Members: Adam Masters (Imp. College), Diego Turrini (IAPS)

Voyager Anniversary

On 24 January 1986, in situ exploration of Ice Giants began with the Voyager 2 flyby of Uranus. Neptune followed in 1989. Some remarks received on the Uranus anniversary.

Fran Bagenal: "[...T]he magnetosphere of Uranus is weird and wonderful [...] Yes, we really should go back."





Uranus and Neptune at 18.7 μm from ESO/VLT in 2006 (Orton et al. 2015).

Glenn Orton: "[Right now I am on] Mauna Kea [...] getting Uranus imaging with [...] Subaru."

Mike Flasar: "[We discovered Uranus and Neptune have] cool regions in the tropopause. [...W]e attributed these to adiabatic cooling associated with ascending motions that were mechanically forced, but by what is still a mystery. [...] I still wonder."