Future exploration of the ice giants

Scientific discussion meeting

20 – 21 January 2020

Part of the Royal Society scientific programme

THE ROYAL SOCIETY

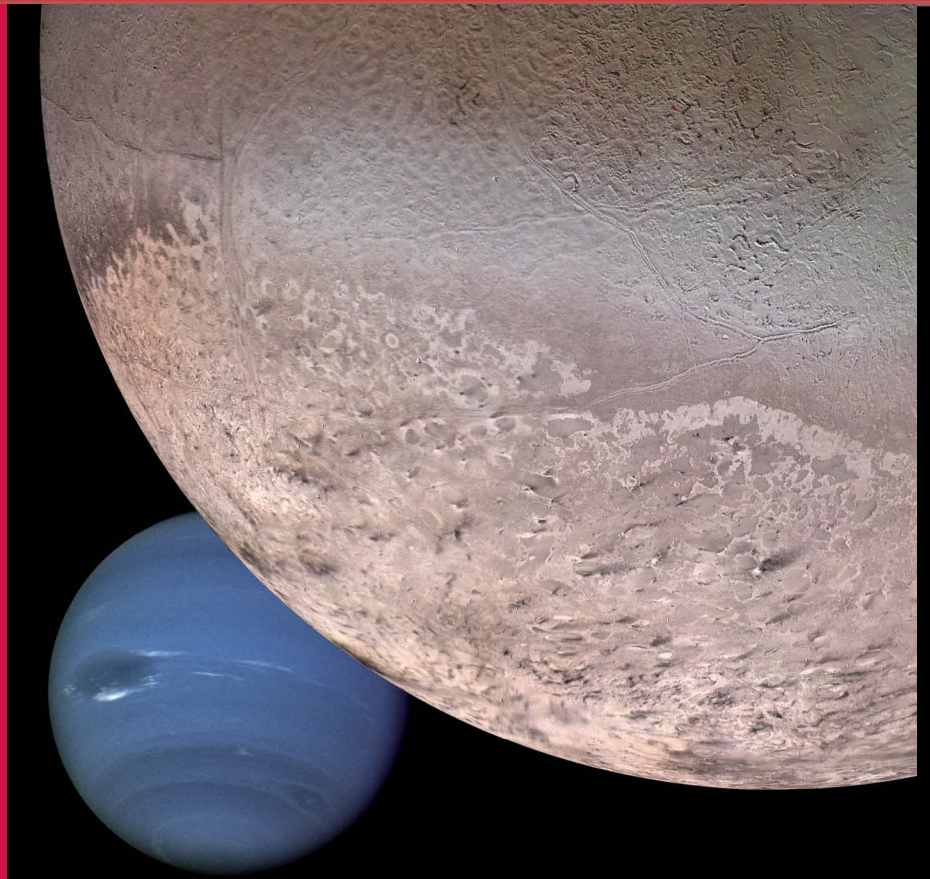
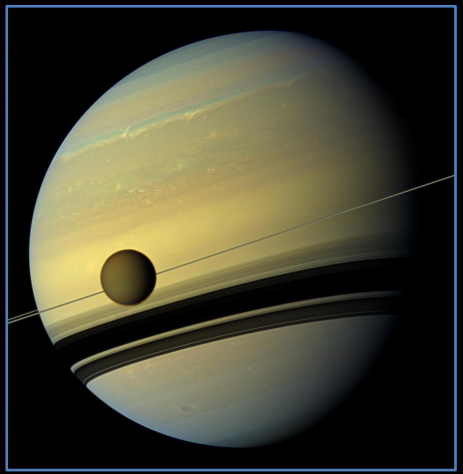


Image: NASA/JPL/USGS.

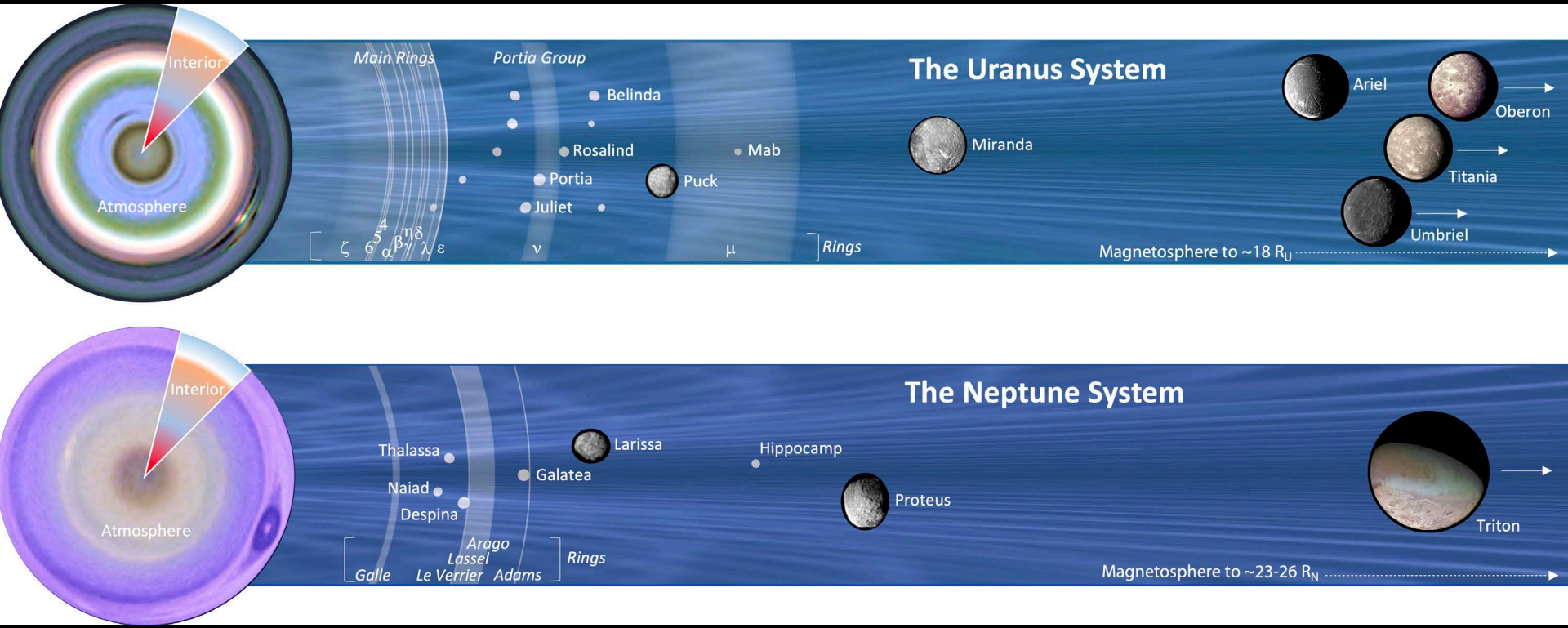
Onwards to the Ice Giants

Uranus,
February 1st 1986

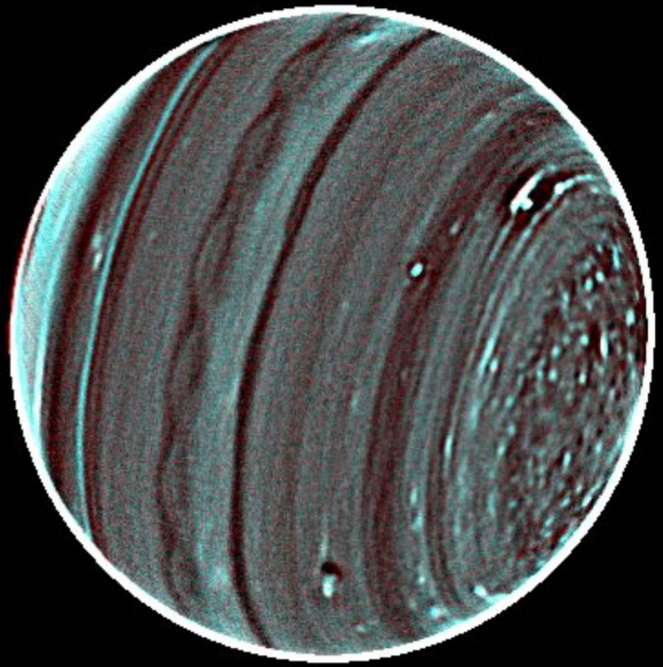
Neptune & Triton,
September 3rd 1989



Ice Giant Systems



Meeting Goals



- Review our understanding of Ice Giant Systems.
- Reach beyond the planetary science community.
- Engage new stakeholders – industrial partners and national agencies.
- Showcase existing mission concepts and technologies.
- Develop coordination strategy & roadmap for the coming years.
- To push for mission concept development ahead of 2030 opportunities.

Meeting Logistics – https://ice-giants.github.io

Plenary Review & Discussion

- Monday-Tuesday 9am-5pm
- Lunch provided 12:30-13:30.
- RS Archive Display

Splinter Sessions

- Wednesday 10:00-17:00
- **Royal Astronomical Society** (Atmospheres, Interiors, Origins).
- **Geological Society** (Magnetospheres, Satellites, Rings).
- Lunch (GeolSoc) 12:00-13:00

Posters

- Monday 17:00-18:30
- Drinks reception.
- Early-Career Networking 19:00-21:00 (Golden Lion)

Meeting Outputs

- Philosophical Transactions
- Meeting findings for key stakeholders.

Day One: January 20th 2020:

Session 1 09:00-12:30: Ice Giant Planets

- 09:15-09:45 *Origin, evolution, and internal structure of the ice giants,* Professor Ravit Helled, University of Zurich, Switzerland
- 09:45-10:15 *Interior structure and energy balance on the Ice Giants,* Dr Jonathan Fortney, University of California, Santa Cruz, USA
- 10:15-10:30 Discussion - interiors objectives
- 10:30-11:00 Coffee break
- 11:00-11:25 *Atmospheric dynamics and cloud structure of the ice giants,* Dr Ricardo Hueso, University of Bilbao, Spain
- 11:25-11:50 *Photochemistry in the atmospheres of Uranus and Neptune,* Dr Julianne Moses, Space Science Institute, USA
- 11:50-12:15 *The upper atmospheres of the ice giants,* Dr Henrik Melin, University of Leicester, UK
- 12:15-12:30 Discussion 2 - Atmospheric objectives

Session 2 13:30-15:00: Ice Giant Magnetospheres

- 13:30-13:55 *Dynamos of ice giant planets,* Dr Krista Soderlund, University of Texas at Austin, USA
- 13:55-14:20 *Ice giant magnetospheres,* Dr Carol Paty, University of Oregon, USA
- 14:20-14:45 *Ice giant auroras,* Dr Laurent Lamy, Observatoire de Paris, PSL, CNRS, France
- 14:45-15:00 Discussion - magnetic field objectives
- 15:00-15:30 Tea break

Session 3 15:30-17:00: Agency Perspectives

- 15:30-16:00 *US Perspectives on ice giant missions,* Dr Mark Hofstadter, JPL/Caltech, USA
- 16:00-16:30 *ESA perspectives on ice giant missions,* Dr. Fabio Favata and Dr. Luigi Colangeli
- 16:30-17:00 Discussion - individual agencies and mission proposals

Poster Session 17:30-18:30

Day Two: January 21st 2020:

Session 4 09:00-12:30: Cross-disciplinary perspectives

- 09:00-09:25 *Lessons learned from (and since) the Voyager 2 flybys of Uranus and Neptune,* Dr Heidi Hammel, Association of Universities for Research in Astronomy, USA
- 09:25-09:50 *The exoplanet perspective,* Dr. Hannah Wakeford, Space Telescope Science Institute, USA
- 09:50-10:15 *Cross-NASA divisional relevance of an ice giant mission,* Dr Abigail Rymer, JHU-APL, Maryland, USA
- 10:15-10:30 Discussion - summary of knowledge gaps
- 10:30-11:00 Coffee

Session 5 11:00-12:30: Ice Giant Systems

- 11:00-11:25 *The rings and inner satellites of Uranus and Neptune,* Dr Mark Showalter, SETI Institute, USA
- 11:25-11:50 *The Uranian satellite system,* Dr Elizabeth Turtle, JHU-APL, Maryland, USA
- 11:50-12:15 *Triton and the Kuiper Belt connection,* Dr Michele Bannister, Queen's University Belfast, UK
- 12:15-12:30 Discussion - Satellite/rings objectives

Session 6 13:30-17:00: Enabling technologies

- 13:30-13:55 *Mission design prospects,* John Elliot, JPL, USA
- 13:55-14:20 *Enabling technologies for ice planet exploration,* Dr Thomas R Spilker, Independent Consultant, USA
- 14:20-14:45 *The development of European radioisotope space nuclear power systems,* Dr Richard Ambrosi, University of Leicester, USA
- 14:45-15:00 Discussion - technologies
- 15:00-15:30 Tea
- 15:30-16:00 *Strategy for coordination 2020+,* Dr Amy Simon, NASA Goddard Spaceflight Center, USA, and Dr Mark Hofstadter, JPL/Caltech, USA
- 16:00-17:00 Panel discussion