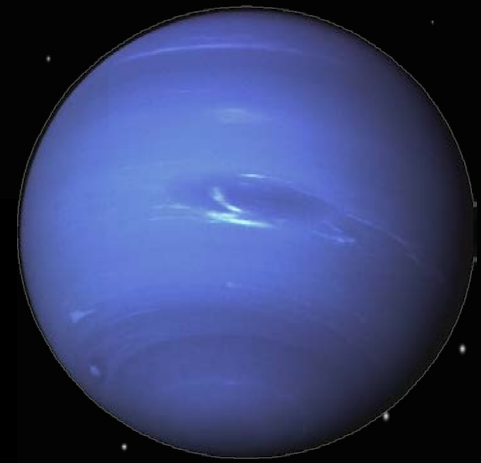
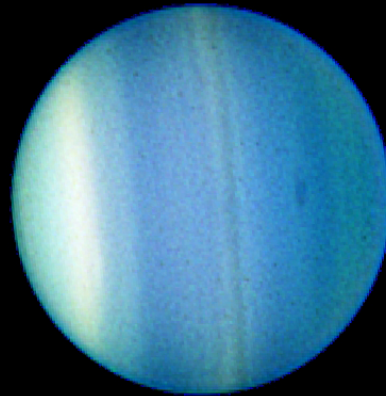
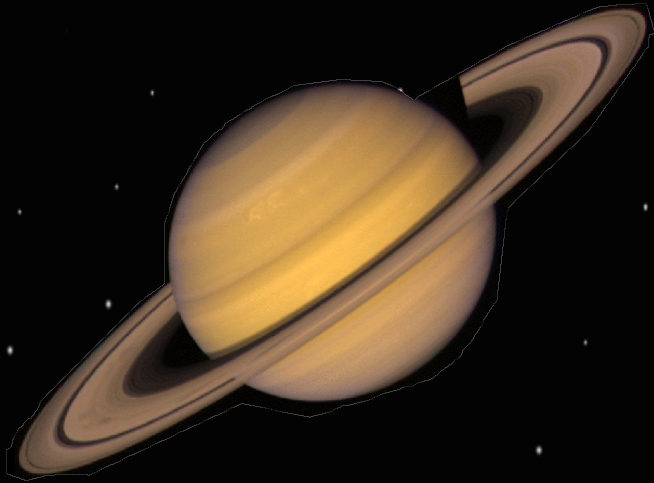


OPAG



15-16 July 2013



Outer Planets Assessment Group Charter

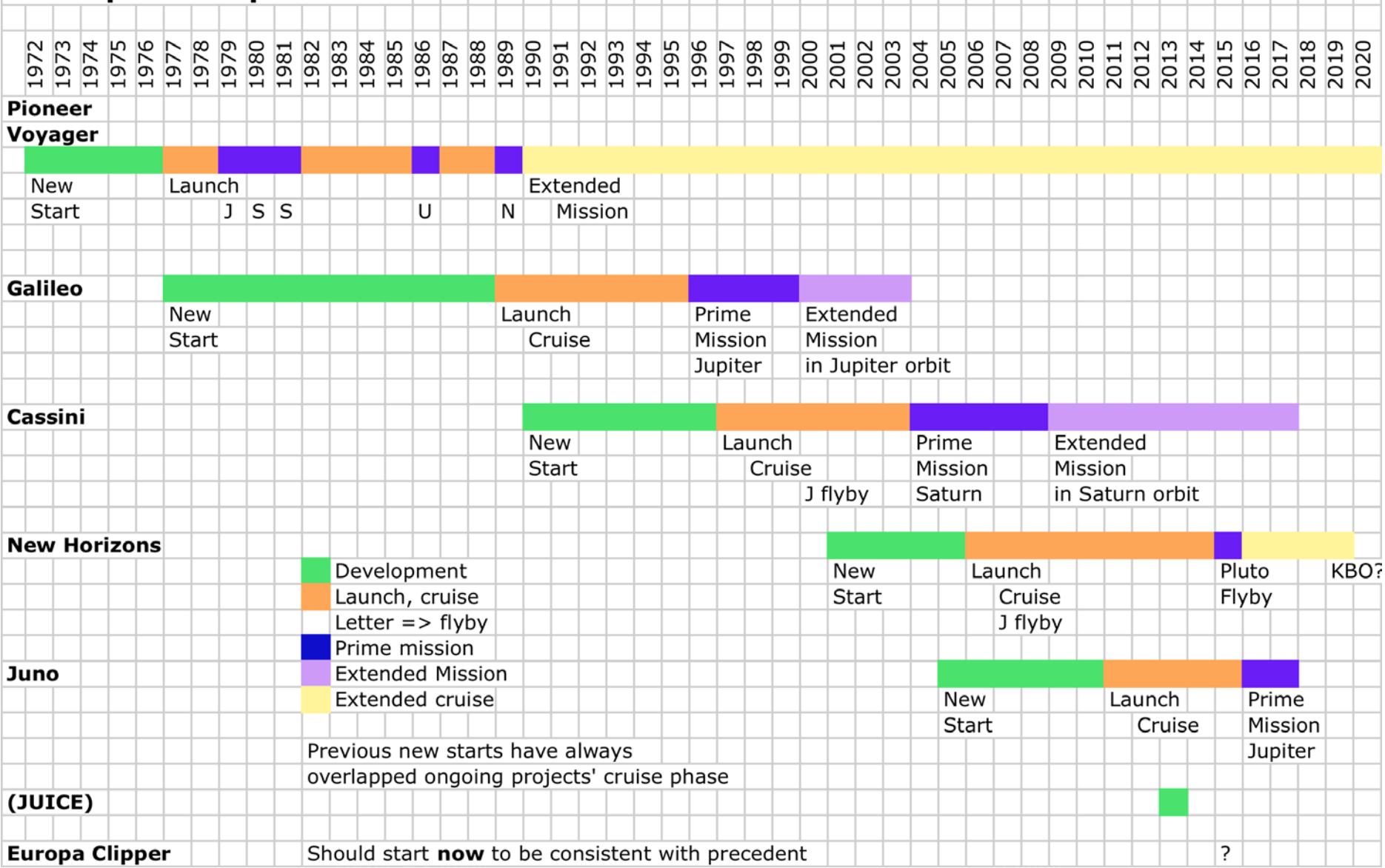
- OPAG is NASA's community-based forum designed to provide science input for *planning and prioritizing outer planet exploration activities for the next several decades*.
- (Old: It is chartered by NASA's Solar System Exploration Division and reports its findings at meetings of the Solar System Exploration Sub-Committee of the NASA Space Science Advisory Committee.) *We now report to the Planetary Science Subcommittee of the NASA Advisory Council (NAC)...*
- Open to all interested scientists, OPAG regularly evaluates outer solar system exploration goals, objectives, investigations and required measurements on the basis of the widest possible community outreach.

Over 500 people have registered their interest on the LPI OPAG website – that's the size of our community

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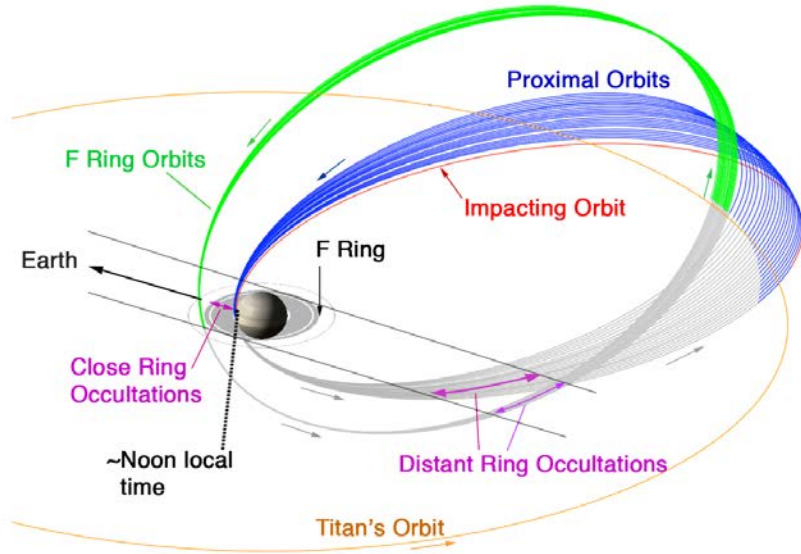
This is what we're up against...

Outer planet exploration

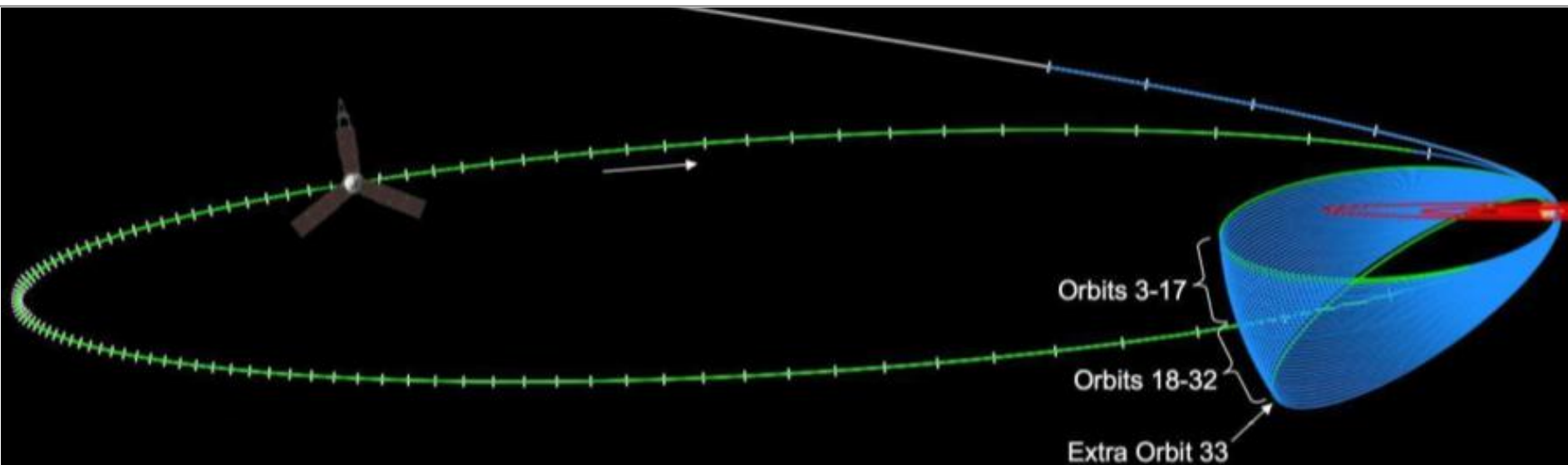


The lights go out in 2018 with no new US-led missions in development, although exploration may go a bit longer with the New Horizons KBO

Juno and Cassini



- Cassini End-of-Mission at Saturn is determined by when it runs out of fuel; planned plunge into Saturn is September 2017
- Juno End-of-Mission at Jupiter is based on predicted radiation damage; predicted plunge into Jupiter's atmosphere is October 2017



Decline in NASA Planetary Launches

- 2003-2012:

- MESSENGER – Mercury
- GRAIL -- Moon
- Lunar Reconnaissance Orbiter
- MER-Opportunity
- MER-Spirit
- Mars Reconnaissance Orbiter
- Phoenix – Mars lander
- Mars Science Laboratory
- Dawn – Vesta and Ceres
- Juno – Jupiter
- Deep Impact – comets
- New Horizons – Pluto

- **Total: 12 missions, from Mercury to Pluto, all successful**

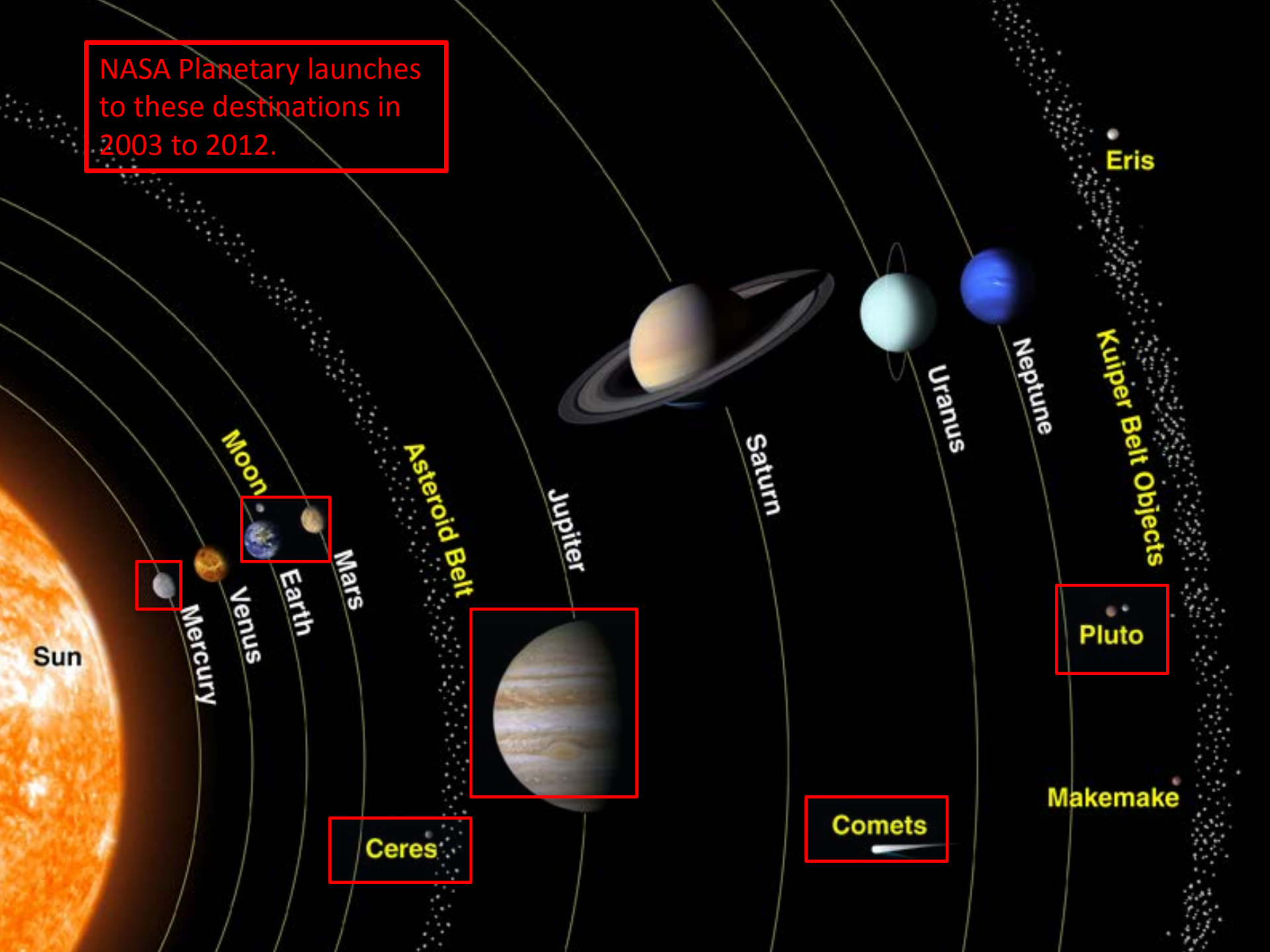
- 2013-2022:

- LADEE – Moon
- MAVEN – Mars orbiter
- InSight – Mars Lander
- OSIRIS-Rex – near-Earth asteroid sample return
- 2020 Mars rover
- New Discovery mission?

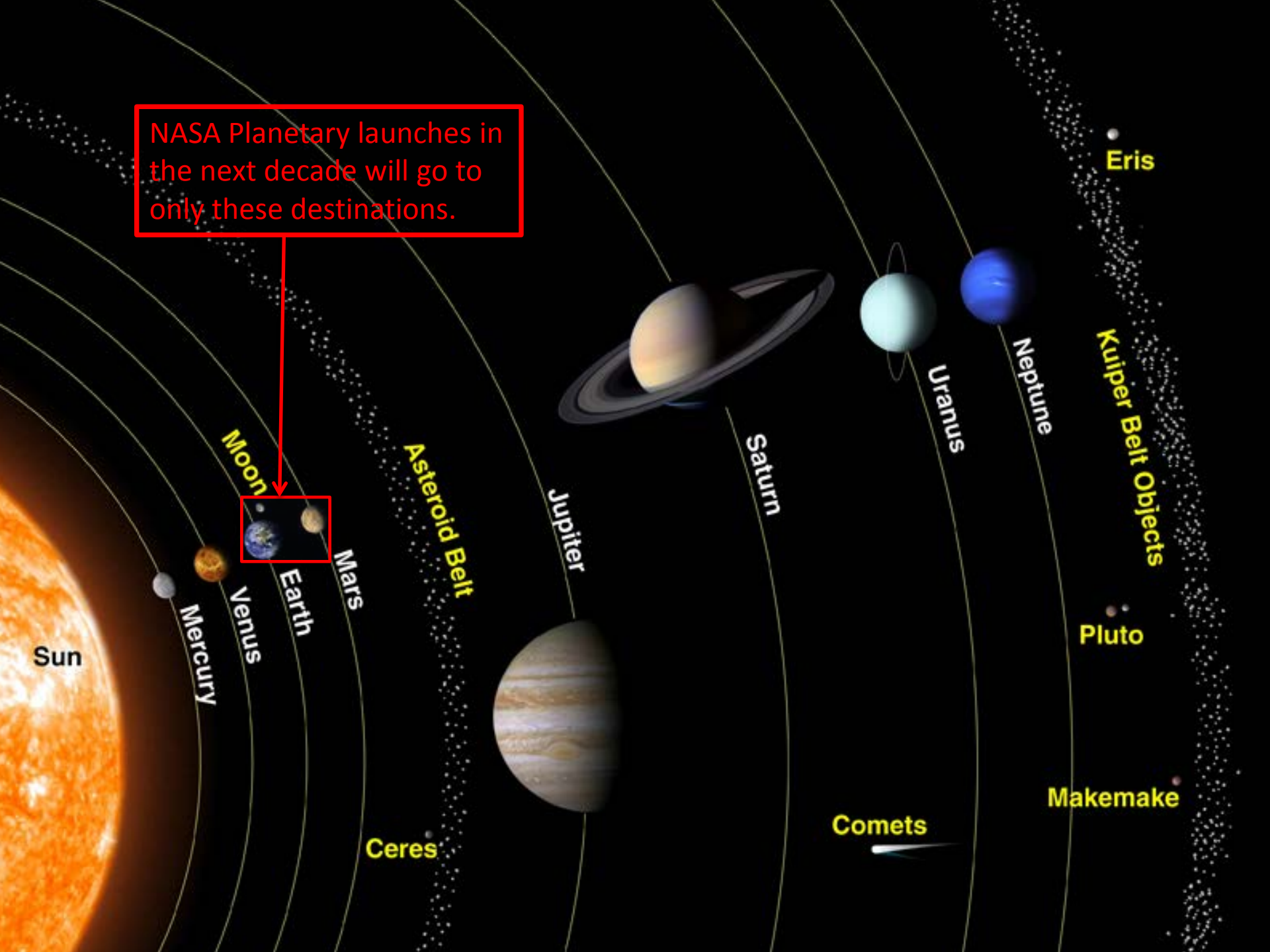
- **Total: 5 or 6 missions**

- **It is already too late to increase the number of launches over the next decade, except for one Discovery mission if the planetary budget is restored soon.**

NASA Planetary launches
to these destinations in
2003 to 2012.



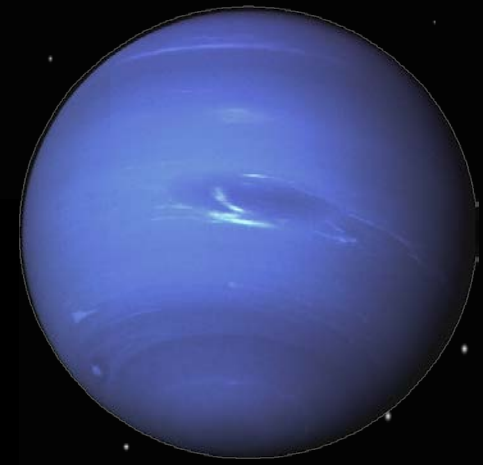
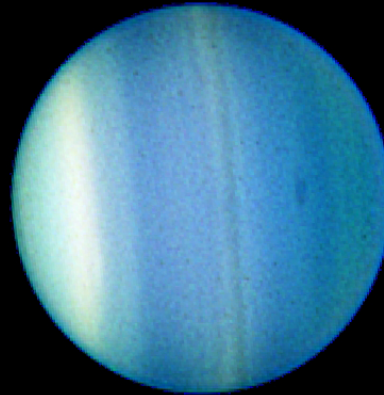
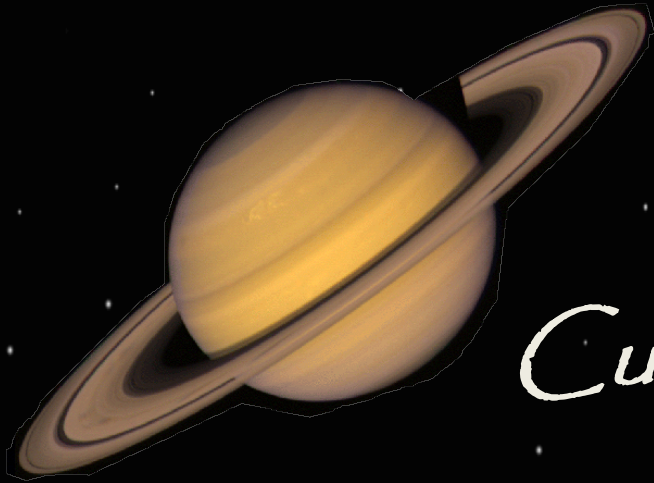
NASA Planetary launches in the next decade will go to only these destinations.



Bright Spots

- We have a legacy of fabulously successful missions and rich datasets -> R&A
- We have the potential for a New Horizons KBO flyby to stretch out our active missions
- We have the possibility of getting a Discovery mission to the outer solar system
- We are back in the Pu238 production business, without which the doors to the outer solar system would be shut (as was the case at the time of the New Frontiers 3 AO)
- We have technology development plans and fresh ideas for achieving new missions
- Europa Clipper is a “shovel ready” mission concept, and can achieve flagship-worthy science that is high priority in the decadal survey while hitting the price-point of \$2-2.5B (not \$4B)

OPAG



Current Assessment

- The present is fabulous:
 - New Horizons, Juno, Cassini
 - New Pu238, potential for Discovery missions
- The future is worrisome

Our challenge: How do we influence the future?





Agenda

Monday theme: where are we today

- 9:00 am Intro, welcome and objectives (Candy Hansen)
- 9:15 NASA PSD report, incl. budget news and responses to OPAG findings (Jim Green)
- 10:15 Outer planets report, incl. JUICE (Curt Niebur)
- 10:30 *Break*
- 10:45 PSS Report (Janet Luhmann)
- 11:00 Europa Clipper update
 - Instrument development funding (Curt Niebur)
 - Other progress (Bob Pappalardo & Barry Goldstein)
- 12:15 Destination Europa (Britney Schmidt)
- 12:30 *Lunch*
- 1:30 Cassini extended mission and outyear funding (Linda Spilker)
- 1:50 DPS actions in response to budget (Heidi Hammel)
- 2:05 Juno Report (TBD)
- 2:25 Galilean satellite globes (Dave Williams)
- 2:35 Outer planet R&A report: OPR, CDAPS (Terry Hurford)

Agenda

Monday theme: where are we today (cont.)

2:50 *Break*

3:00 New Horizons update / Pluto conference (Alan Stern)

3:20 Pu238 domestic production (Len Dudzinski)

3:40 Technology updates

 TRL uniformity – Pat Beauchamp

 STMD updates – Pat Beauchamp

 Making outer planets missions easier - Nathan Strange

 Uranus Technology study status:

 Entry studies and probe concepts - Parul Agrawal

 Science considerations for an atmospheric entry probe - Mark

 Marley

 A Low-Cost Small RPS Enabled Mission Concept – TBD – may be omitted

4:45 Uranus brightness changes (Richard Schmude)

Open mike for comments

Adjourn

Group dinner

Agenda

Tuesday theme: where do we need to head

- 9:00 am General thoughts on OPAG membership and organization (Hansen)
Subcommittees (Titan, early career researchers, others?); Tasks
- 9:20 New science goals document (Hansen, plus writing assignments)
- 9:40 European activities (Athena Coustenis)
Uranus workshop
L-Class white papers
- 10:00 Look ahead to next decadal survey discussion (all)
Target-rich – how to handle
Science goals, not targets?
Schedule for funding mission studies in advance of next decadal
- 10:30 *Break*
- 11:00 Subcommittee recommendations for Discovery AO's (Ralph Lorenz)
- 11:20 Suggestions for outer planets in Discovery – feedback (Michael New)
- 11:30 How to best to be pro-active for outer planet science (all)
Workshops and symposia?
Astrobiology roadmap?
Other ideas?
- Noon *Adjourn; Steering Committee meets over lunch to draft findings***

Backup

Findings' Action Items from January

- Europa Clipper
- Cassini Solstice Mission
- JUICE support for young scientists to join later
- NASA should advance midterm review of Decadal Survey
- Discovery missions to outer solar system
- Pu238 and ASRGs
- Incentivize TPS in Discovery and NF AO
- PSD work with STMD to support technology development important to outer solar system exploration