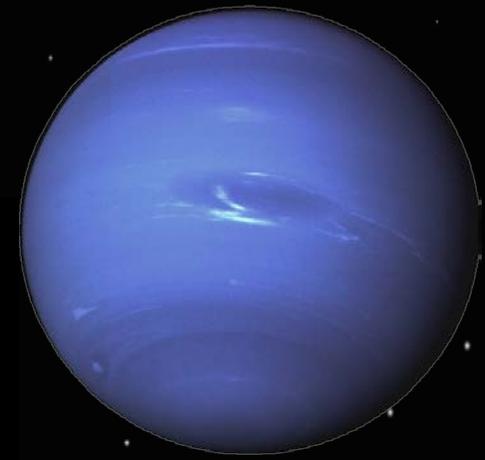
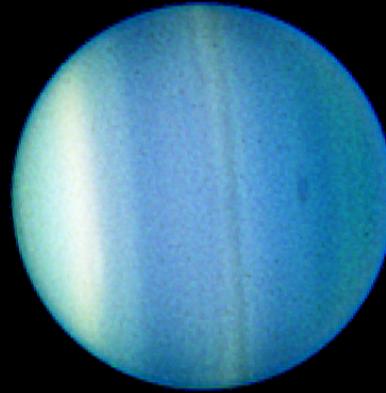
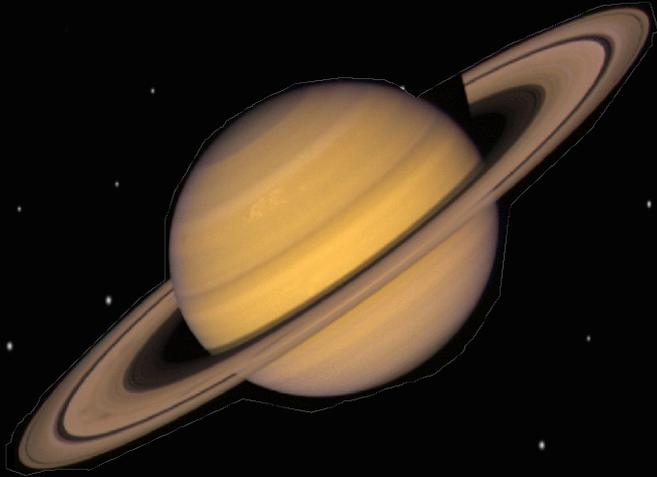


OPAG



Goals, Tasks,
Organization, Challenges



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.
 - Long-term strategy
- 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.
 - Near-term strategy

General thoughts

The “Visions and Voyages” writers are done – we are the voice of the outer planets community until the next decadal survey

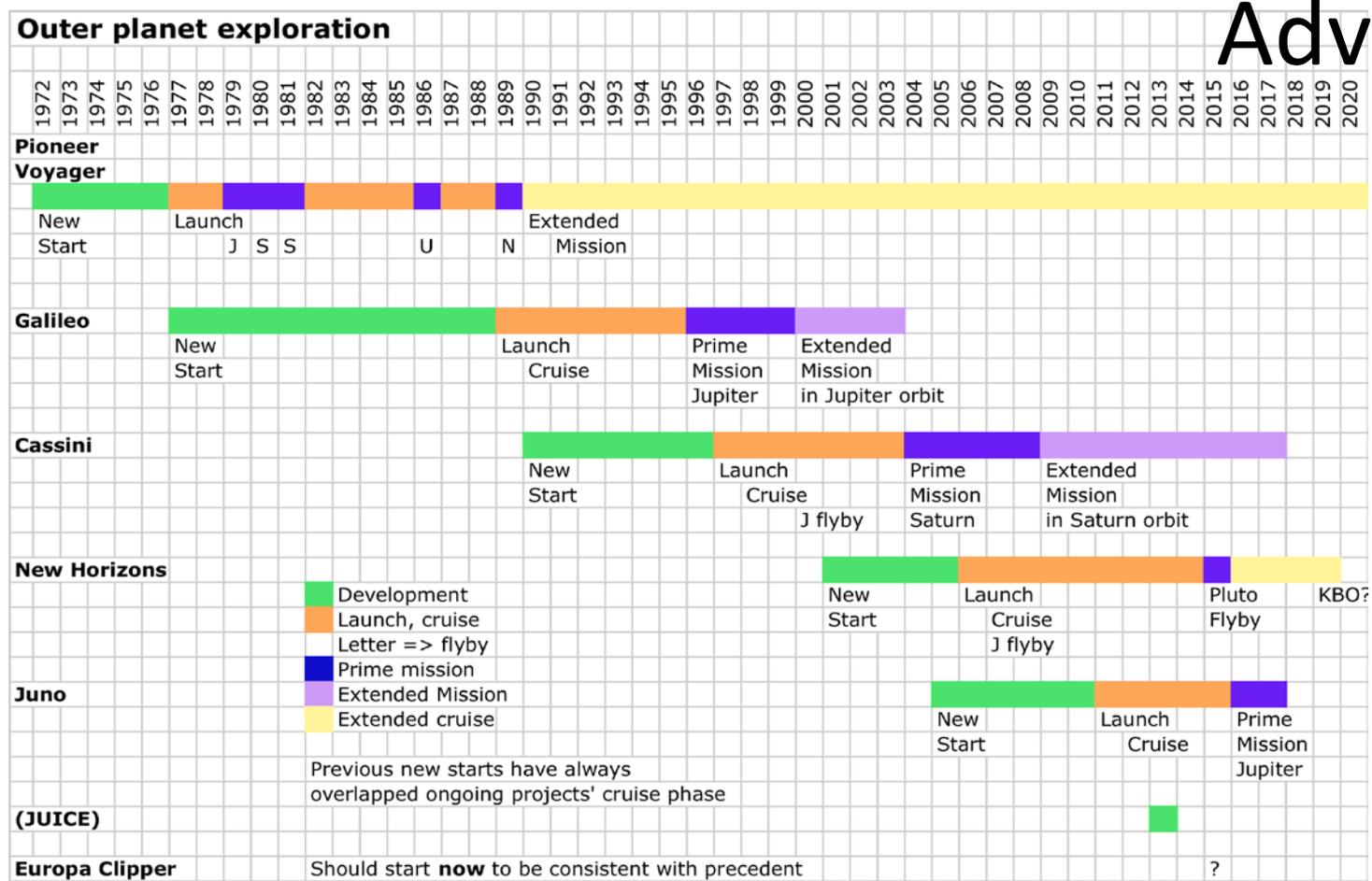
- Constructively confront new budget realities
 - Europa Clipper is responsive to the new reality
 - More focus on New Frontiers and Discovery
- React to new discoveries
- Promote technology development for outer solar system exploration
- Advocate for outer solar system exploration within the planetary community and NASA
 - E.g. articulate why it isn't enough just to go to Mars (even though we love Mars)
 - On agenda for later this morning
- Prepare for the next decadal survey
 - What to do about our target-rich dilemma?



Sidebar

New Frontiers

Advantages



NF1: New Horizons

NF2: Juno

Disadvantage: No guarantees

New Frontiers has been good for outer solar system exploration

- Competitive selection process culls out best and most feasible science goals
- PI-led missions less likely to over-run because of central decision-making
- NF3 might have gone to outer solar system if Pu238 had been available

OPAG Path forward

- *Immediate* – update 2006 science doc
- *Then* – aggressively pursue new technology (this is an area that we should be able to influence immediately)
- *After that* – weigh in on midterm review of Visions and Voyages
- *Followed by* – studies of missions in prep for next Decadal Survey
- *As we are doing all this* – we need a strategic plan to explore our target-rich field
 - Morph our science doc? Or new roadmap?
- Consider a multi-decadal strategic vision
 - How do we get to all the 5-star destinations in the outer solar system?
 - Is the flyby-orbit-sample paradigm valid?
 - What is a possible timeline?
 - How rigid / how flexible should such a plan be?
 - Want to incorporate new discoveries and thinking without being completely helter-skelter

OPAG Path Forward

- Immediate – update 2006 science doc
- Then – aggressively pursue new technology (this is an area that we should be able to influence immediately)
- Doesn't necessarily require PSD funding – we had a very nice presentation from OCT at the last OPAG meeting

Science pathways via OPAG

- Last full document was in 2006
 - “Scientific Goals and Pathways for Exploration of the Outer Solar System”: A Report of the Outer Planets Assessment Group (OPAG) 2006
 - Plus the Decadal Survey white paper 2009
 - Plus the Technology Recommendations 2009
- Time to update the OPAG Goals and Pathways report
 - Make more consistent with Visions and Voyages
 - NASA has implemented many of the findings elucidated in 2006
- Science sections need some, but sadly not many, updates
 - This is due to lack of new missions (so mainly Cassini updates to include)
 - But we’ll have lots in 2015-2017
- Plan of attack: Morph the old doc by first updating the science, then the associated findings
- Then update the technology document

Broadbrush Changes Needed

- Bring our document in-line with Decadal goals
 - Add goals for Io, add Saturn probe, beef up Uranus
 - Update connections to new decadal, replacing references to old 2003 decadal survey
- Update Titan and Enceladus sections
- Add how exoplanet comparisons motivate Uranus and Neptune investigations
- Re-write Europa to be consistent with Clipper concept
- Update Cassini science results
- Identify missions that could be carried out within a New Frontiers budget
- Identify science goals that are important yet focused enough that they could potentially be addressed by a Discovery mission like TIME or IVO

The OPAG Committee

	Interest / Expertise
Heidi Hammel	Gas / Ice Giants
Mark Hofstadter	Gas / Ice Giants
Linda Spilker	Rings
Jack Connerney	Magnetospheres
Kevin Baines	Atmospheres - big and medium-size
Jason Barnes	Titan
Ralph Lorenz	Titan, technology
Jani Radebaugh	Titan, Io
(David Williams)	Io
Britney Schmidt	Europa
Jeff Moore	Icy sat's geology
Candy Hansen	Icy sat's activity & exospheres; Triton
Bill McKinnon	Icy sat interiors, planetary evolution
Pat Beauchamp	Technology

Broadbrush Changes Needed

- Bring our document in-line with Decadal goals
 - Add goals for Io (**Jani**), add Saturn probe (**Kevin, Mark, Heidi**), beef up Uranus (**Mark**)
 - Update connections to new decadal, replacing references to old decadal (**Heidi**)
- Beef up Titan (**Jason, Ralph**) and Enceladus (**Jeff, Candy**) sections
- Add exoplanet comparisons (**Heidi, Mark**)
- Re-write Europa to be consistent with Clipper concept (**Britney**)
- Update Cassini science results (**Linda**)

Broadbrush Changes Needed (cont.)

- Identify missions that could be carried out with a New Frontiers mission rather than flagships (all); technology required to make them feasible and competitive (Pat)
- Identify science goals that are important yet focused enough that they could be addressed by a Discovery mission like TIME or IVO (all) ; technology required to make them feasible and competitive (Pat)

Near-Term Plan

- Have new sections written by the time of the next OPAG meeting
- Collectively we will go through the old findings and draft new ones
- Solicit mission ideas and required technologies from all your colleagues – report at next OPAG meeting
- Collectively we will go through these ideas and identify with Pat the technologies we'll want to push for
 - Taking advantage of sources of funding beyond PSD

OPAG Path forward

- After that – weigh in on midterm review of Visions and Voyages
- Followed by – studies of missions in prep for next Decadal Survey
- Finally, recommendations for the next Decadal Survey
 - We have so many fabulous places to explore!

Our Dilemma of Destinations

Do we attack this like a Michelin guide?

Worth a journey

Worth a detour

Interesting

Or should we recommend a decadal survey with science goals and no particular mission recommendations?

Juno was selected because it met the science goals, not the mission description, in the 2003 decadal survey

Or we could recommend no flagships at all – just a New Frontiers free-for-all

As many as possible

Classic free enterprise competition

Most responsive to new discoveries

OPAG Path forward

- We need a strategic plan to explore our target-rich field
 - A new roadmap?
- Consider a **multi-decadal** strategic vision
 - How do we get to all the 5-star destinations in the outer solar system?
 - Is the flyby-orbit-sample paradigm valid?
 - What is a possible timeline?
 - How rigid / how flexible should such a plan be?
 - Want to incorporate new discoveries and thinking without being completely helter-skelter
- I'd like to form a small group just to take a stab at this, first for review by the committee, then the community
 - **Volunteers?**

OPAG Subcommittees

- Early career researchers
 - Jani
 - Britney
- Technology development
 - Pat
 - Ralph
 - Jason?
- Multi-decade strategic vision