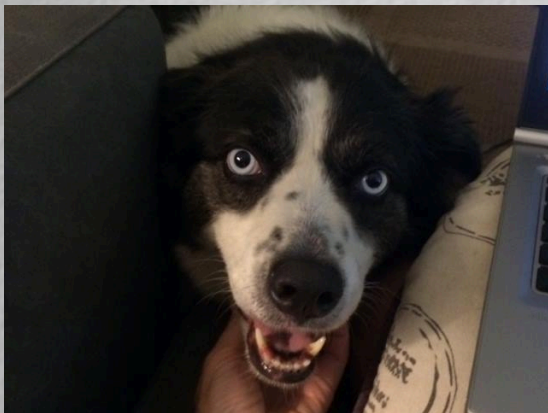


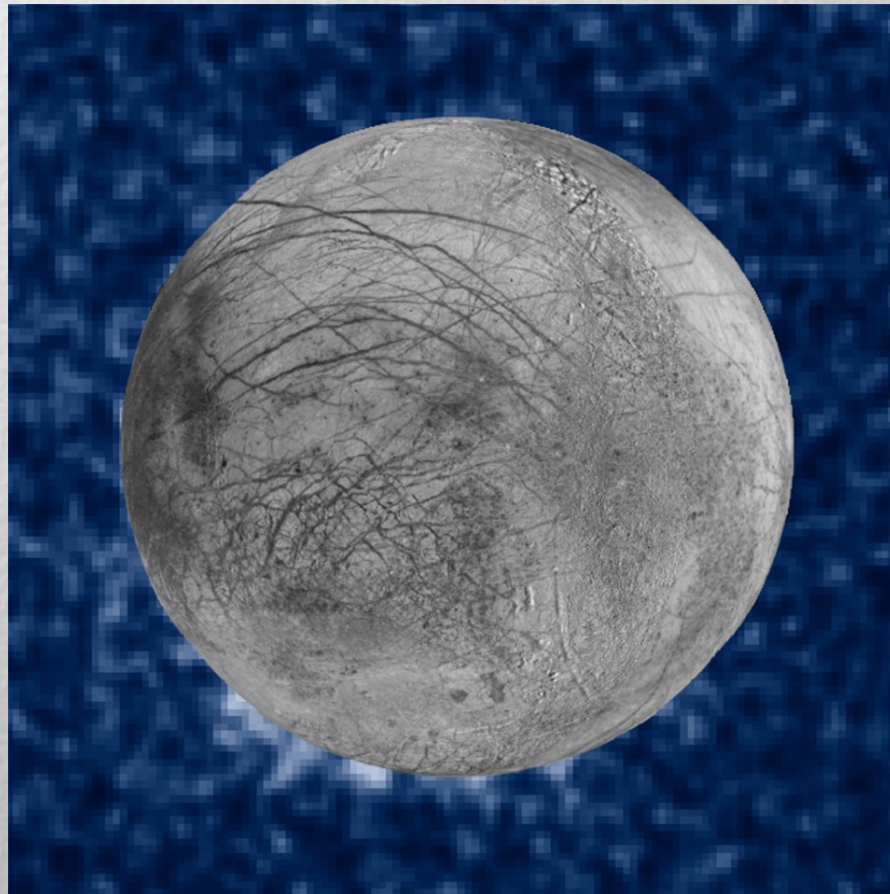
Science policy: Working groups

Neill Reid
SMO



STUC: 7 November 2017

Europa



STUC: 7 November 2017

Europa Advisory Committee

Europa is a key target for NASA Planetary missions
Observations with Hubble suggest the presence of
outgassing from the subsurface oceans

But activity appears to be sporadic and unpredictable

The Director chartered small advisory committee “to
provide advice on how Hubble can best support planning
for potential future missions.”

Committee comprises

John Clarke (Boston University), chair

Amanda Hendrix (Planetary Science Institute)

John Spencer (SouthWest Research Institute)

Europa Advisory Committee: community input

Committee solicited input from the community

HST e-mail, articles in DPS and PEN newsletters

New techniques, assessments of existing techniques

Discussions with Europa mission on their perspective & priorities

Bob Pappalardo, JPL

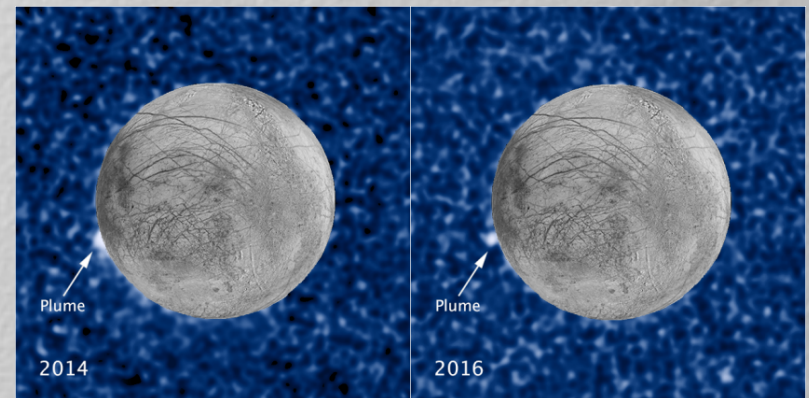
Curt Niebur, NASA HQ

Review of existent HST observations

At outset: 55 observations, 2 detections

Is it real?

Late 2016: repeat detection of emission by Sparks et al; same limb location, different instrumental orientation



Europa Advisory Committee: actions & recommendations

Recommendations:

HST should pursue further observations of Europa

Endorsed techniques being pursued by Roth & Sparks teams

Identified tests of specific observing modes

Primarily testing scattered light in close proximity to Jupiter

Program GO 15371 – data analysed and results published prior to mid-cycle call

Call for observing proposals from the community for the 2017/2018 Jovian apparition via the first Cycle 25 mid-cycle

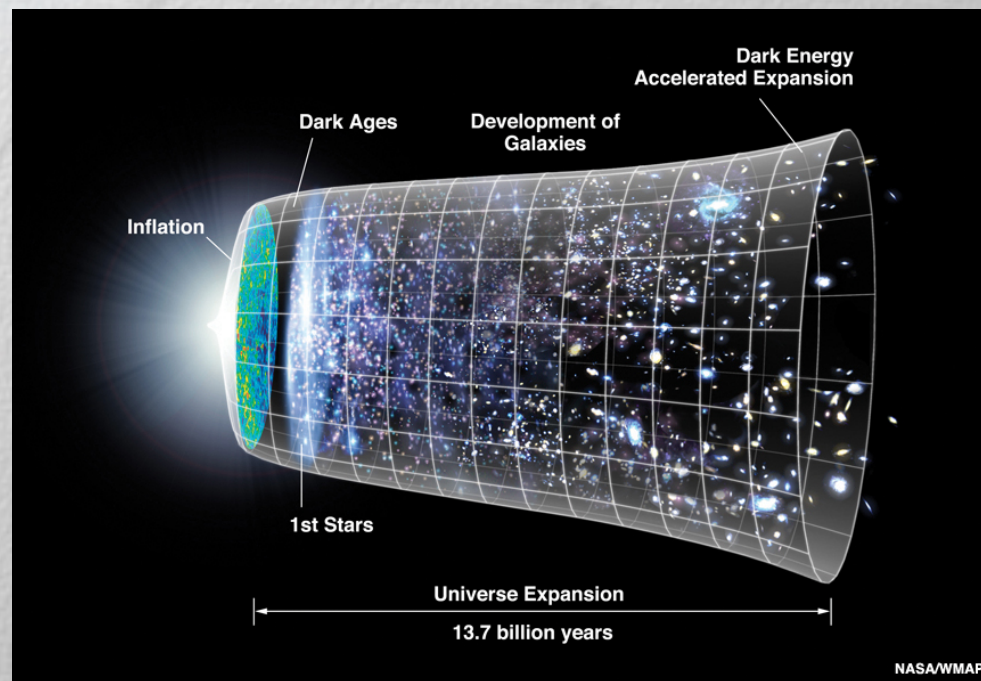
Limit to ~70 orbits

Four proposals under review – results later this week

Report published on the web

<http://www.stsci.edu/proposing/info/europa-report.pdf>

Fundamental Physics



HST and Fundamental Physics

Hubble has made significant contributions to cosmology and fundamental physics

H_0 , dark matter distribution, dark energy

STScI Director has constituted a working group to “explore the intersection between Hubble’s capabilities and the scientific priorities in fundamental physics research and to provide advice on future strategies for implementing appropriate observing programs with HST”

Chair: Bhuvnesh Jain (U. Penn)

Members: Neal Dalal (U. Illinois), Cora Devorkin (Harvard), Jeremy Heyl (UBC), Marc Kamionkowski (JHU), Phil Marshall (Stanford), David Weinberg (OSU)

Working group held several telecom discussions and solicited input from community members on a range of topics. Finale report & recommendations submitted to STScI Director in September 2017

Consultations

The working group consulted with members of the community on several topics:

- H_0 : Wendy Freedman, Adam Riess
- Cepheids & distance scale: Lucas Macri
- Supernovae: Ryan Foley
- Self-interacting dark matter: David Wittman

Other topics:

- Large-scale weak lensing studies
- Gravitational lensing – time delays
- CMD structure & fundamental particles

Areas to explore

- * H_0 : core cosmological problem & powerful complement to other cosmological probes; analysis via
 - Cepheids
 - RGB tip luminosities
 - Strong lens time delay
- *Dark matter via lensing measurements
 - Merging galaxy clusters
 - Substructure in galaxy halos
- -Calibration data for cosmology surveys
 - Lensing shear in reference fields for Euclid/WFIRST
- -Other topics
 - Dark matter in dwarfs (proper motions)
 - Detailed CMD structure to constrain weakly interacting particles
 - SMBH interactions within galaxy nuclei
- *Support for theory and simulations

Conclusions & recommendations

Conclusions:

- HST can continue to make significant contributions to fundamental physics
- Those contributions often require long-term, longitudinal analyses that don't mesh well with an annual proposal cycle

Recommendation

- STScI should establish a multi-year Fundamental Physics program
 - Working group does not recommend a specific science area
 - Topical area should be selected by proposal peer review

Review process

Process

- Two-phase proposal submission
 - Review panel provides feedback & comments on initial proposals
 - Help maximise the science impact for the community
 - Could include a proposal down-select
 - Initial funding provided to support development of full-scale proposals
 - Same panel reviews full proposals to make recommendations
- Proposal parameters
 - Multi-year programs allowed/encouraged
 - Proposal must result in a significant impact for fundamental physics
 - Lower impact programs better suited for the standard GO process
- Timing
 - Process could be coordinated with other HST proposal opportunities, or be carried out on a separate schedule

Summary

- Europa
 - Working group supported continued HST involvement as important to the planetary community
 - Report published
 - Implemented call in conjunction with mid-cycle process
- Fundamental Physics
 - Several key areas highlighted by the working group
 - Recommendations
 - Long term investment in a multi-year program
 - Two-stage review process to help maximise science impact
 - Report currently under consideration by Director
 - To be published soon