

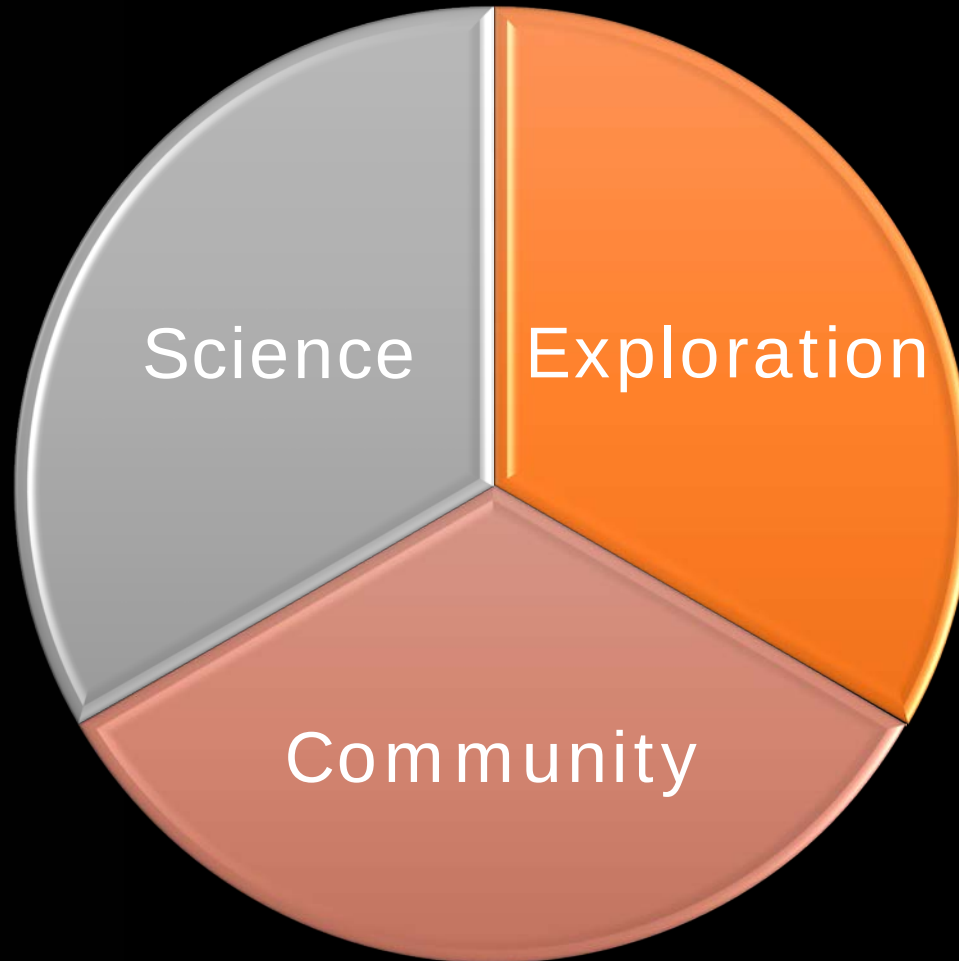


Priorities for Mercury Science and Exploration

Presentation to the Planetary Science and Astrobiology Decadal Survey
Panel on Mercury and the Moon
November 03, 2020

Presenter: Steven A. Hauck, II (CWRU)
on behalf of the Mercury Exploration Assessment Group (MExAG)

MExAG Priorities





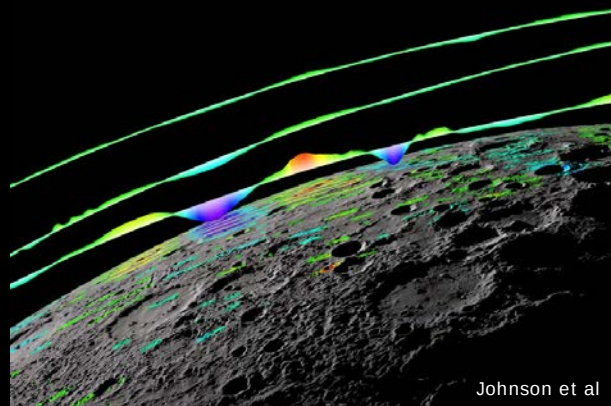
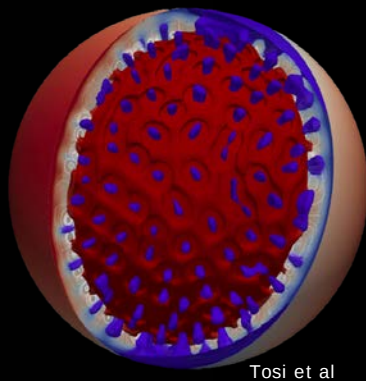
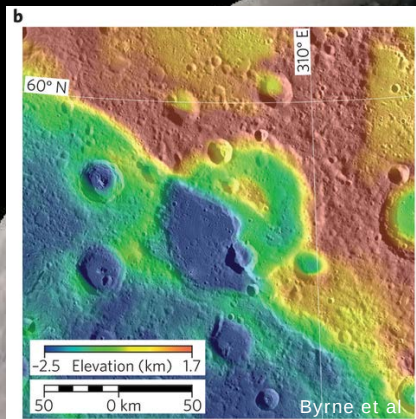
Community

- Advancing exploration and understanding of the Solar System – including Mercury – requires diverse, equitable, inclusive, and accessible community.

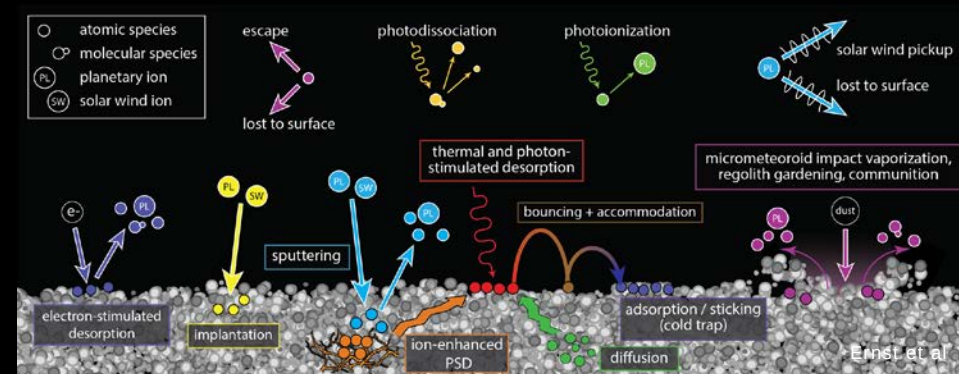
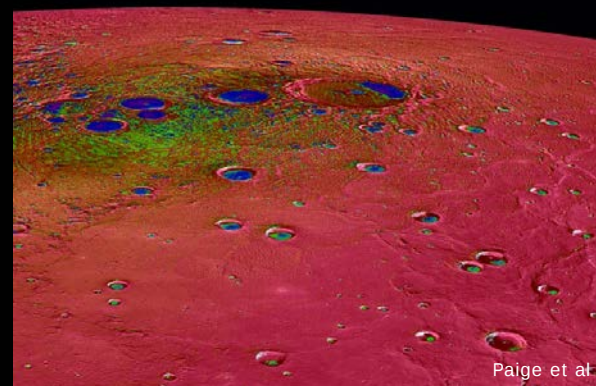
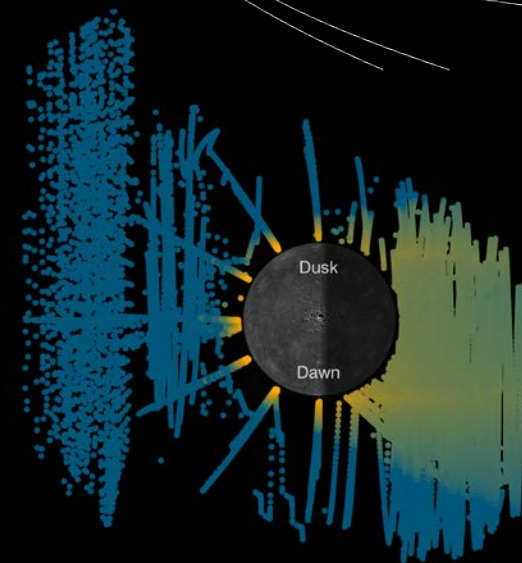
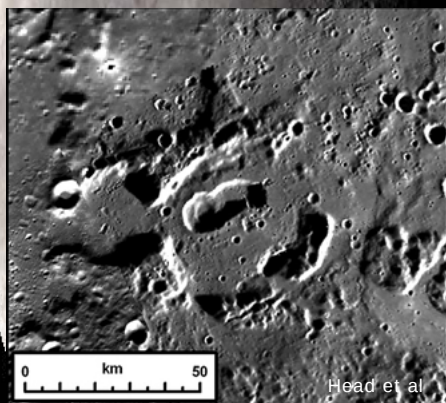
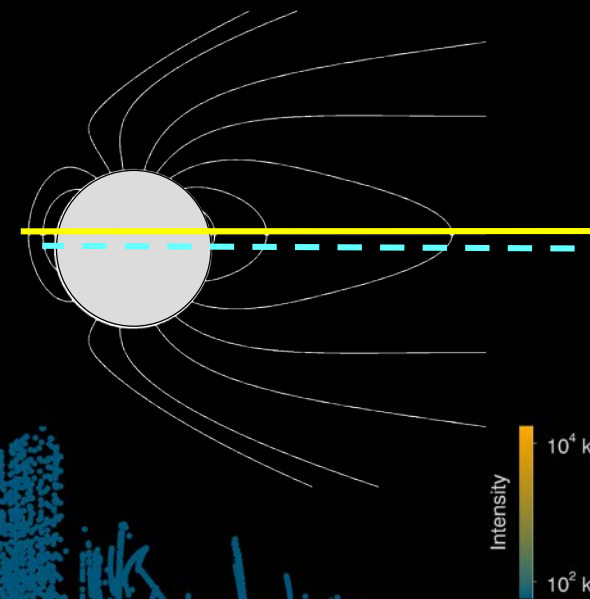


Science

- Understanding Mercury involves embracing the idea that the planet we observe today is the result of a dynamic system of interconnected processes acting over a variety of scales in space and time.
- Unraveling that system requires both focused, disciplinary and broad, interdisciplinary study.



Sodium



Nittler et al



Science: High-Priority Questions

How did Mercury form?

How did Mercury differentiate and acquire its interior structure

What is the history of Mercury's magnetic field and its generation?

How do Mercury's surface and interior reflect the evolution of the planet?

What is the nature of the complex interactions among Mercury's external drivers and the planet's magnetosphere, exosphere, surface, and interior?

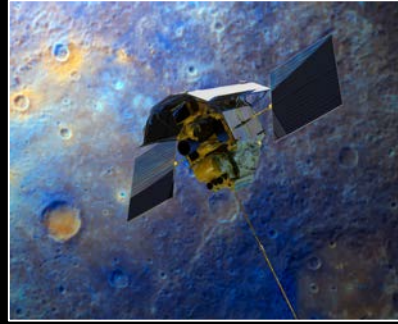
What are the origin, history, and inventory of Mercury's volatiles?

Exploration

Flyby



Orbit



Land

The
Next
Step

- Recognized as next step during previous Decadal
- Critical component of addressing high-priority science questions
- Broad-based community support
- Concept study demonstrates feasibility as a New Frontiers class mission in the next decade



Community + Science + Exploration

- Sustainable approach to research, analysis, and exploration programs and funding
 - Address fundamental questions in planetary science
 - Leverage investments in, and expertise gained by, MESSENGER and BepiColombo missions
 - Build and maintain a community capable and prepared for the next steps in exploration
- International cooperation & participation
- Development of a workforce that is highly capable, diverse, inclusive, equitable, and accessible



Summary of MExAG Priorities

- Build, maintain, and support a vibrant, diverse, inclusive, equitable, and accessible community capable of carrying out science and exploration.
- Drive discovery through study and exploration of the interconnected Mercury system.
- Take the next step in Mercury exploration: land on the surface.