#### Science and Public Engagement Within the Columbia Hills Landing Ellipse

Mars 2020 4<sup>th</sup> Landing Site Workshop, October 16<sup>th</sup>, 2012



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### Thank You For A Wonderful Journey!

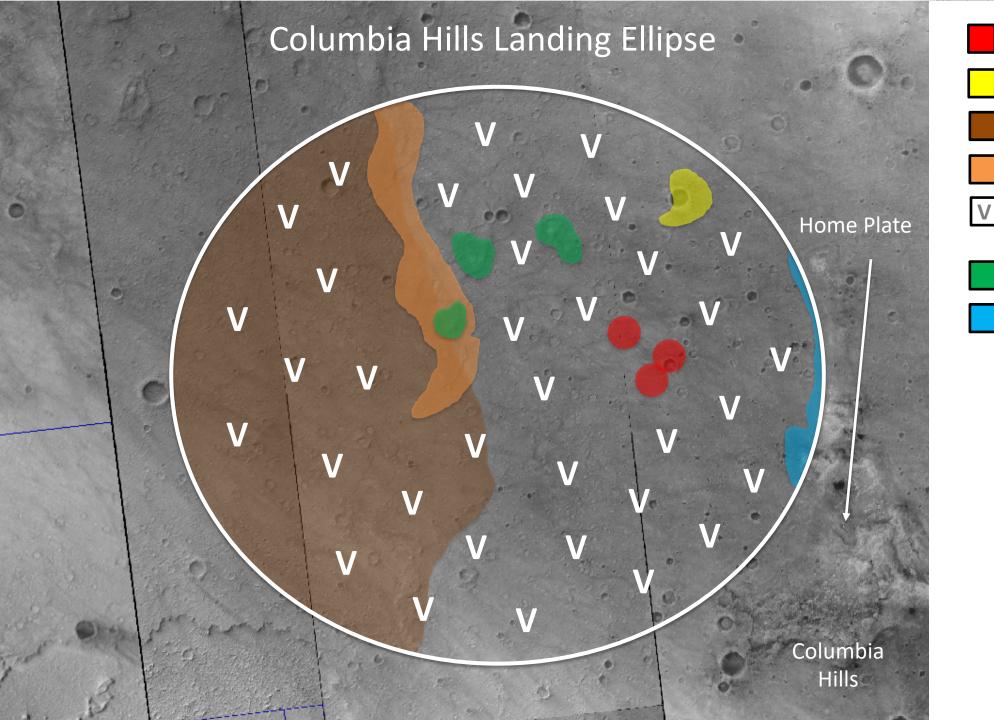


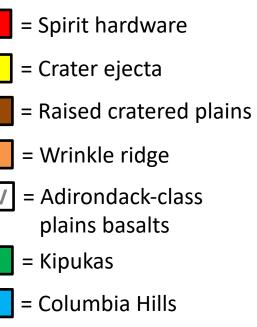
### Motivation for In-Ellipse Science

#### At the "Columbia Hills Site," we can explore the Hills... and what else?



- From the 2<sup>nd</sup> Announcement: Presentations focusing on **unique/new science content** (...) are encouraged
- From MEPAG: (A high) weight should be applied to targets **close to** (or inside) **the landing ellipse**.





#### **Alteration of Adirondack Plains Basalts**

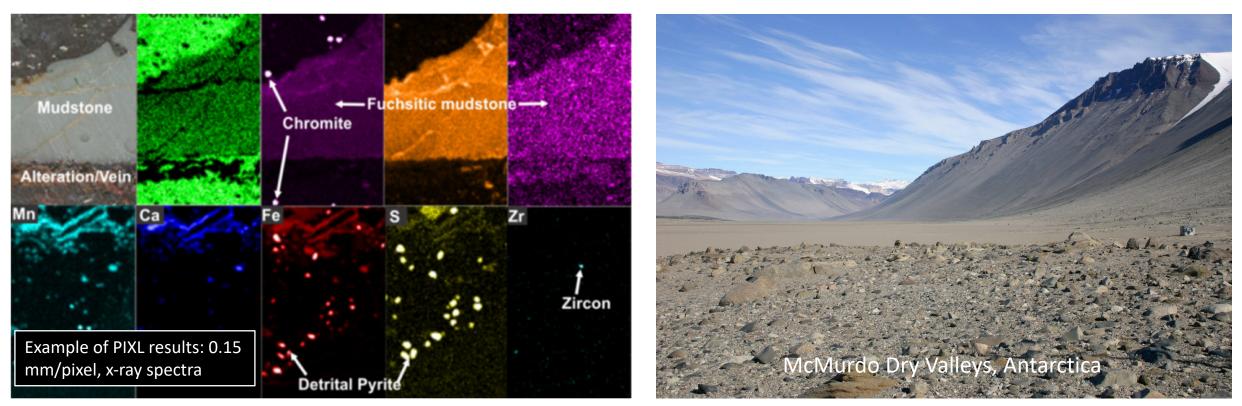
An opportunity to investigate in detail veins in basalt on Mar



## **Alteration of Plains Basalts**

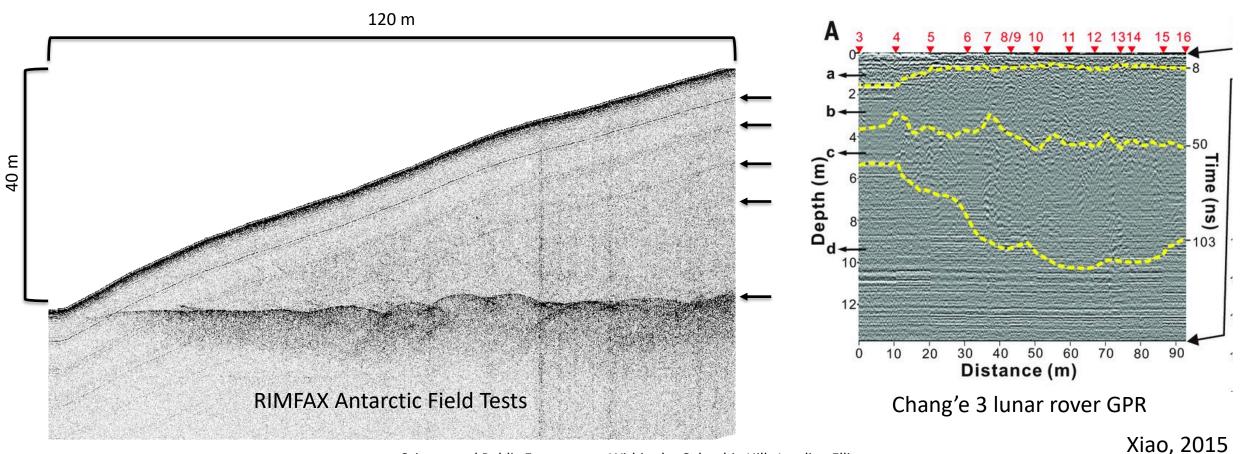
#### **Remaining Questions:**

- How long/often were the plains basalts altered? (Alteration at deposition? Condensation from the atmosphere? Transient surface water?) (Haskin et al., 2005)
  - Implications for long-term habitability



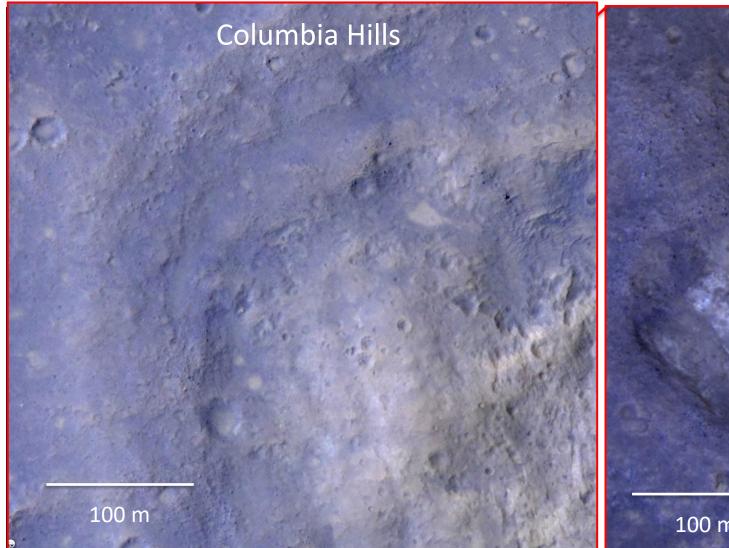
#### What Can RIMFAX Tell Us About Layering on the Plains?

- How thick is the regolith?
- Is there evidence for multiple lava flows?
- RIMFAX should be able to see potential flow layers below the surface regolith down to 10-30 meters

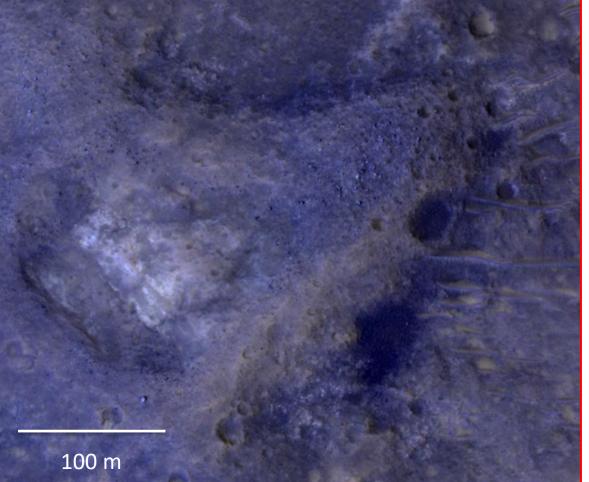


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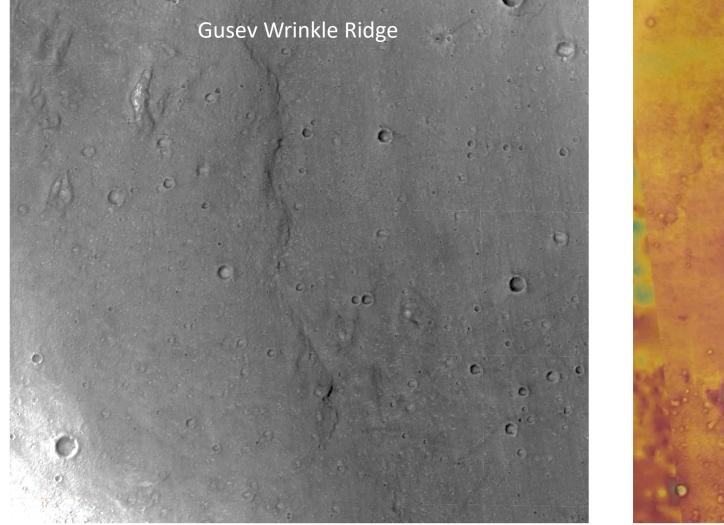
### Scouting Unexplored Kipukas in the Ellipse

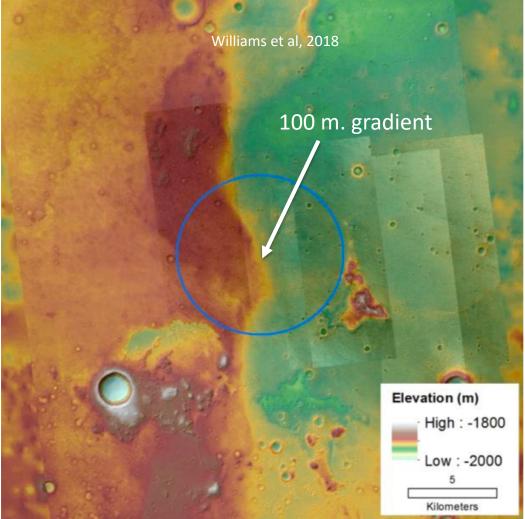


#### Gusev Plains Kipuka



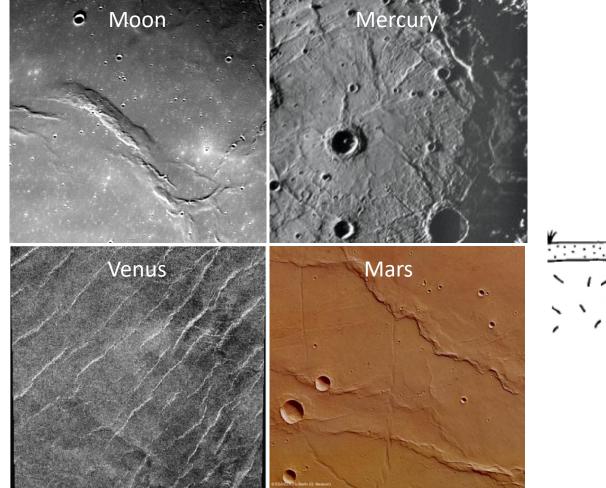
### Evidence of Tectonics at a Wrinkle Ridge

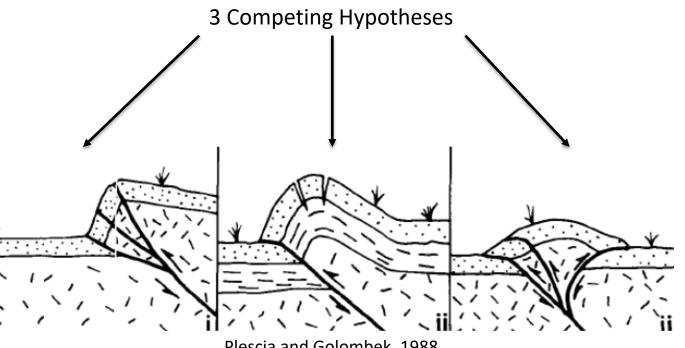




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#### Evidence of Tectonics at a Wrinkle Ridge

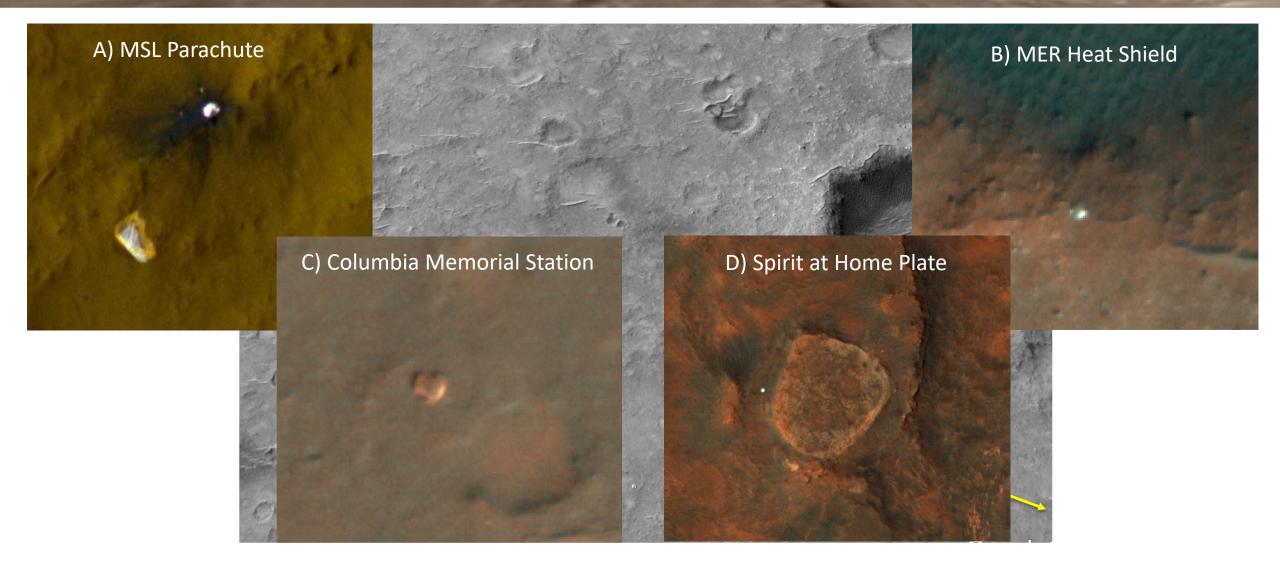




Plescia and Golombek, 1988

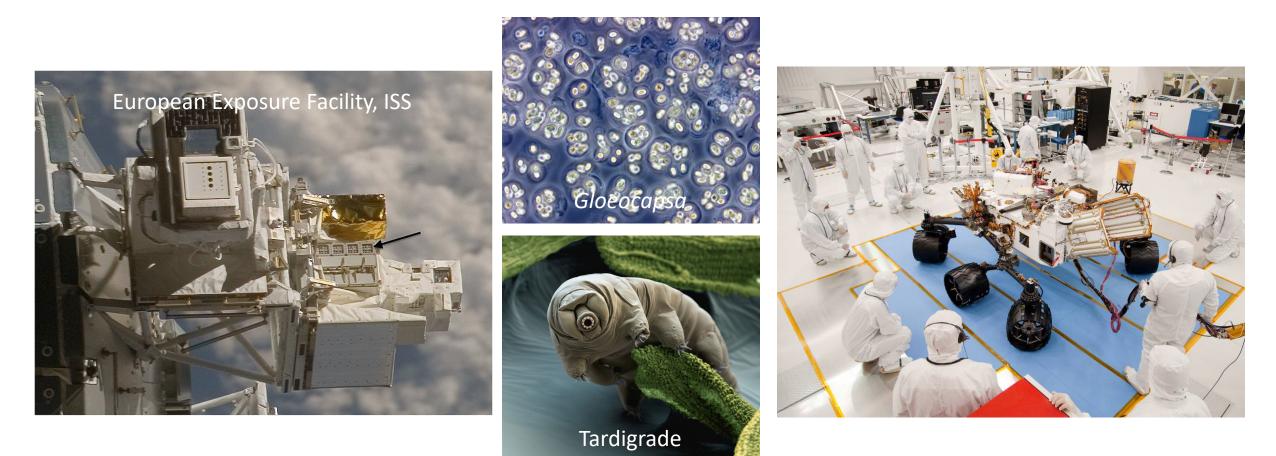
#### Potentially resolvable with RIMFAX

# Inspecting Spirit Hardware



## Microbes on Spirit?

With SuperCam, finding Earth organics on Spirit would be a major discovery, astrobiologically and philosophically
Ultimate test for life in extreme environments



### Conclusion

• The Columbia Hills ellipse offers numerous "bonus" targets of opportunity which offer so much more to explore



- Scientific targets that can be addressed in the Columbia Hills ellipse, but not at the other sites:
  - A wrinkle ridge
  - Diverse Noachian terrain with low-T fluid-altered rocks
  - Spacecraft hardware which informs human exploration and planetary protection
  - Beloved MER Spirit for outstanding public relations potential

