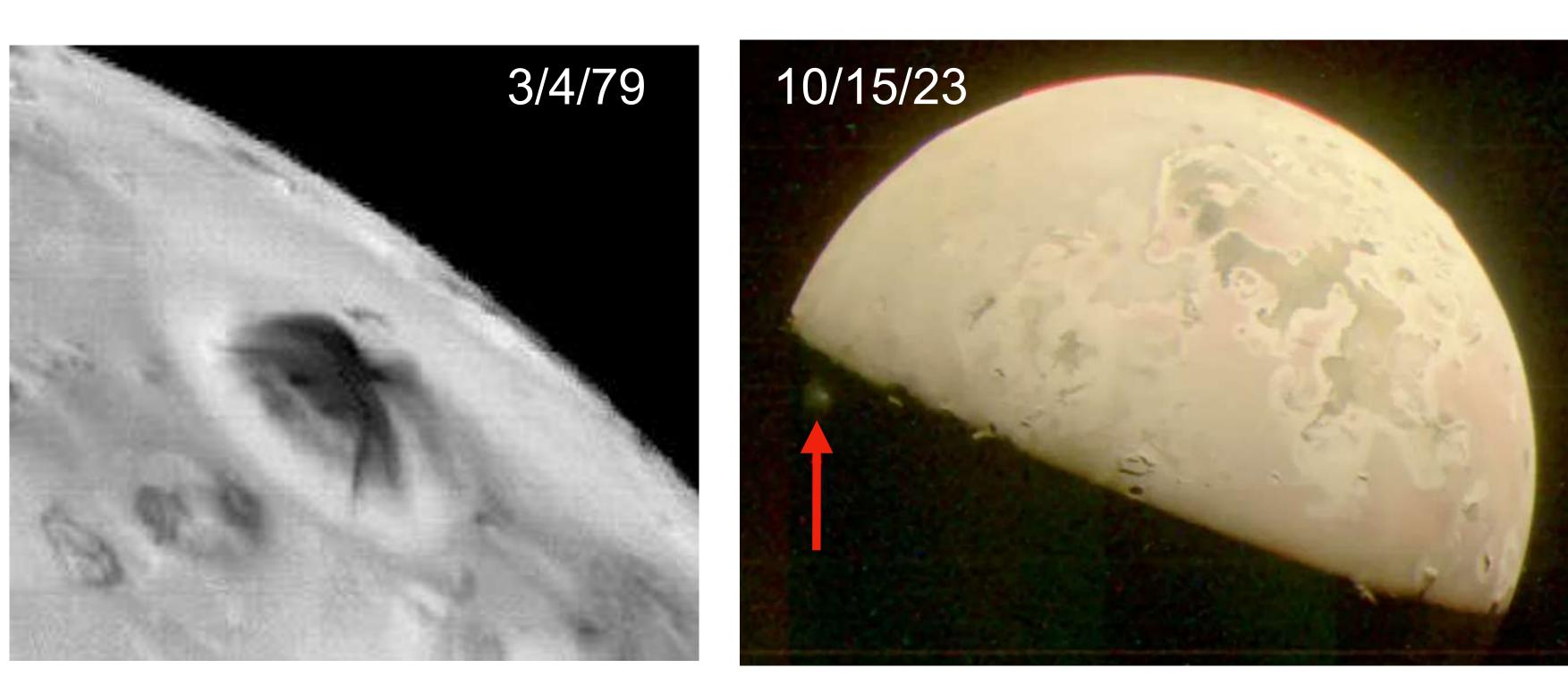
## Sample Return

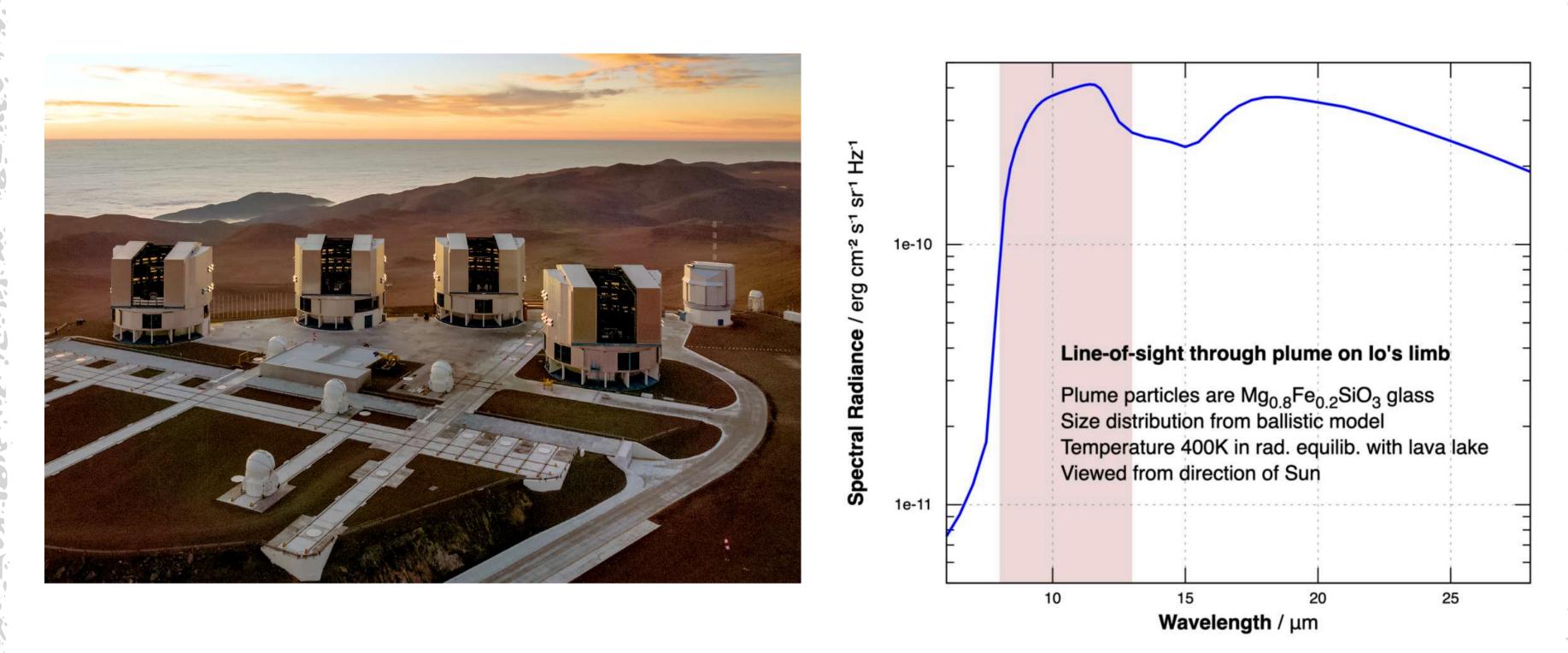
### A Record of Planet Formation in the Outer Solar System

#### Ryan Ogliore, University of Central Florida, Physics Department

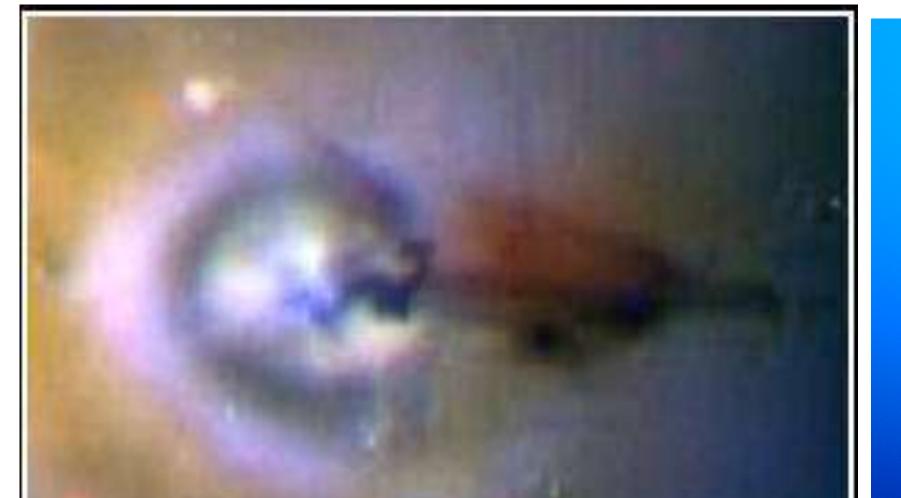
#### Target: lo's Prometheus plume

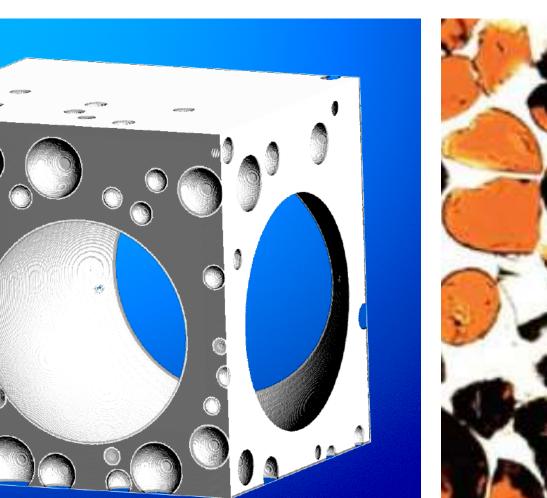


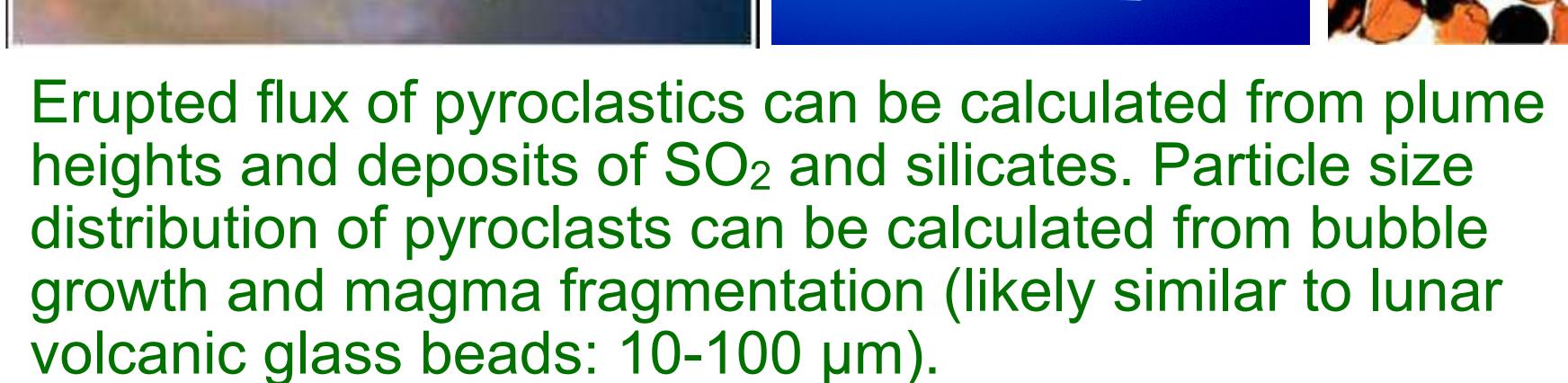
A plume at Prometheus has been seen every time observing conditions have been favorable.



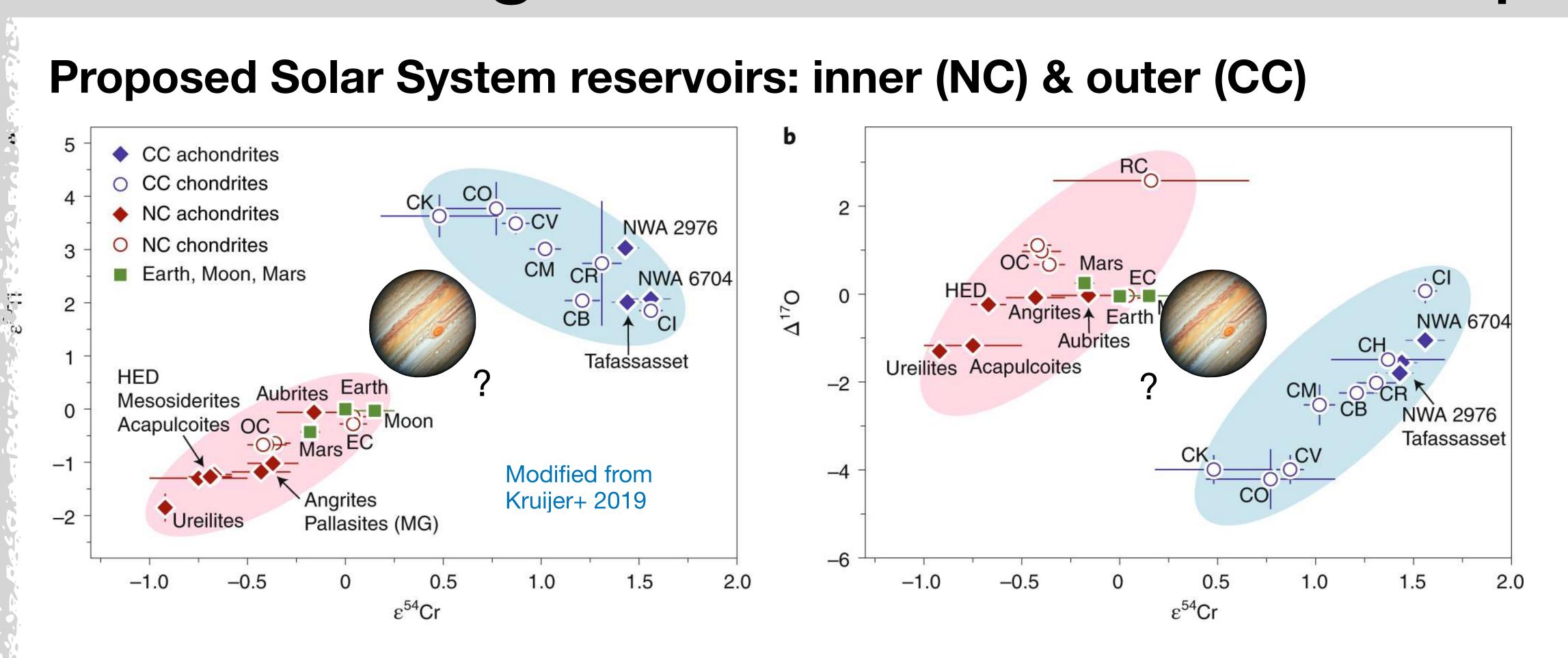
The Prometheus plume on lo can be monitored from the ground during the outbound leg using ESO-VLTI: 10-µm silicate feature from entrained pyroclastics.

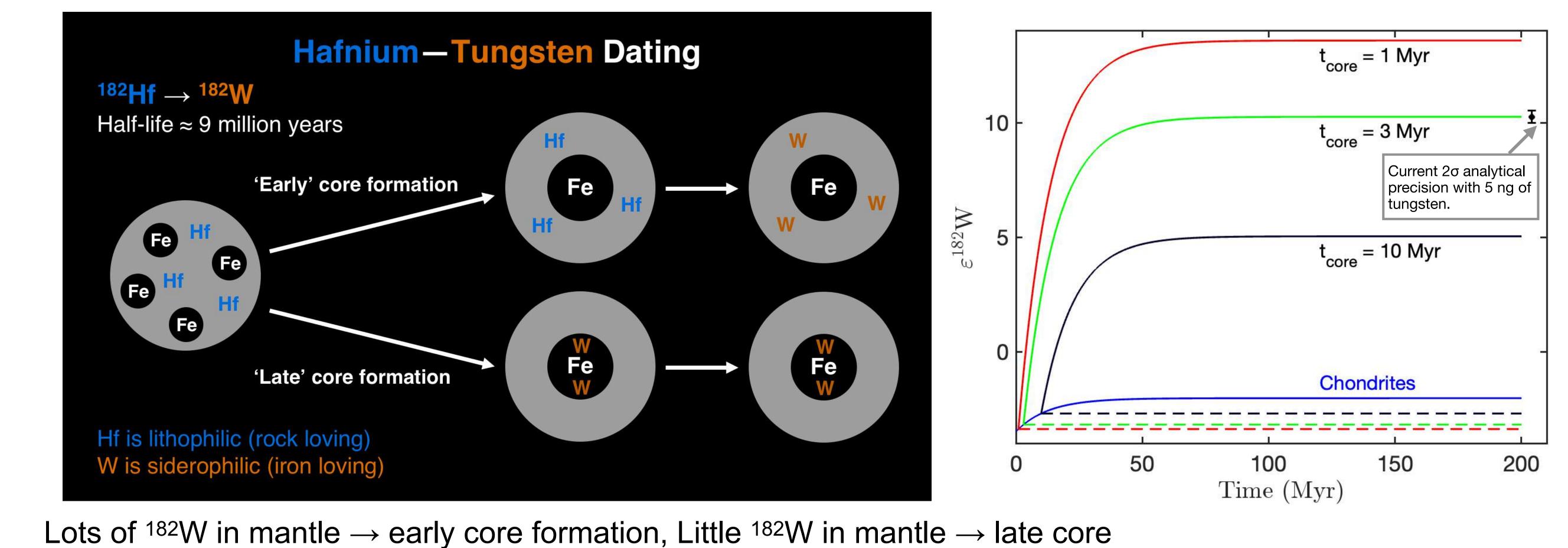


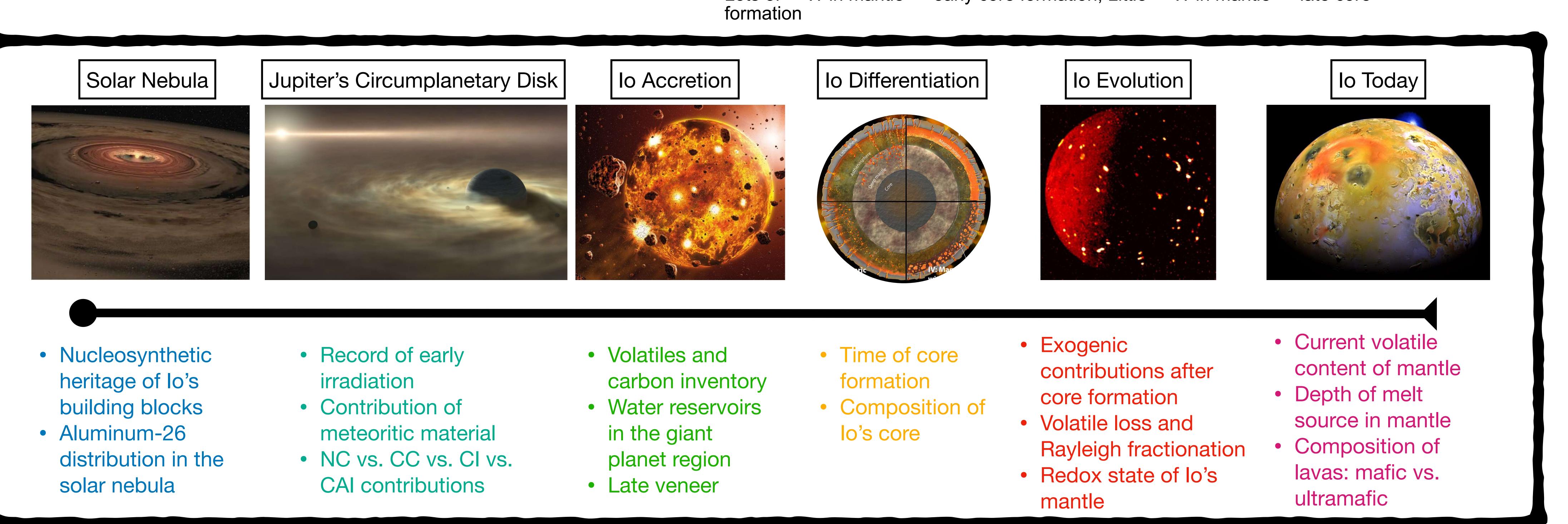


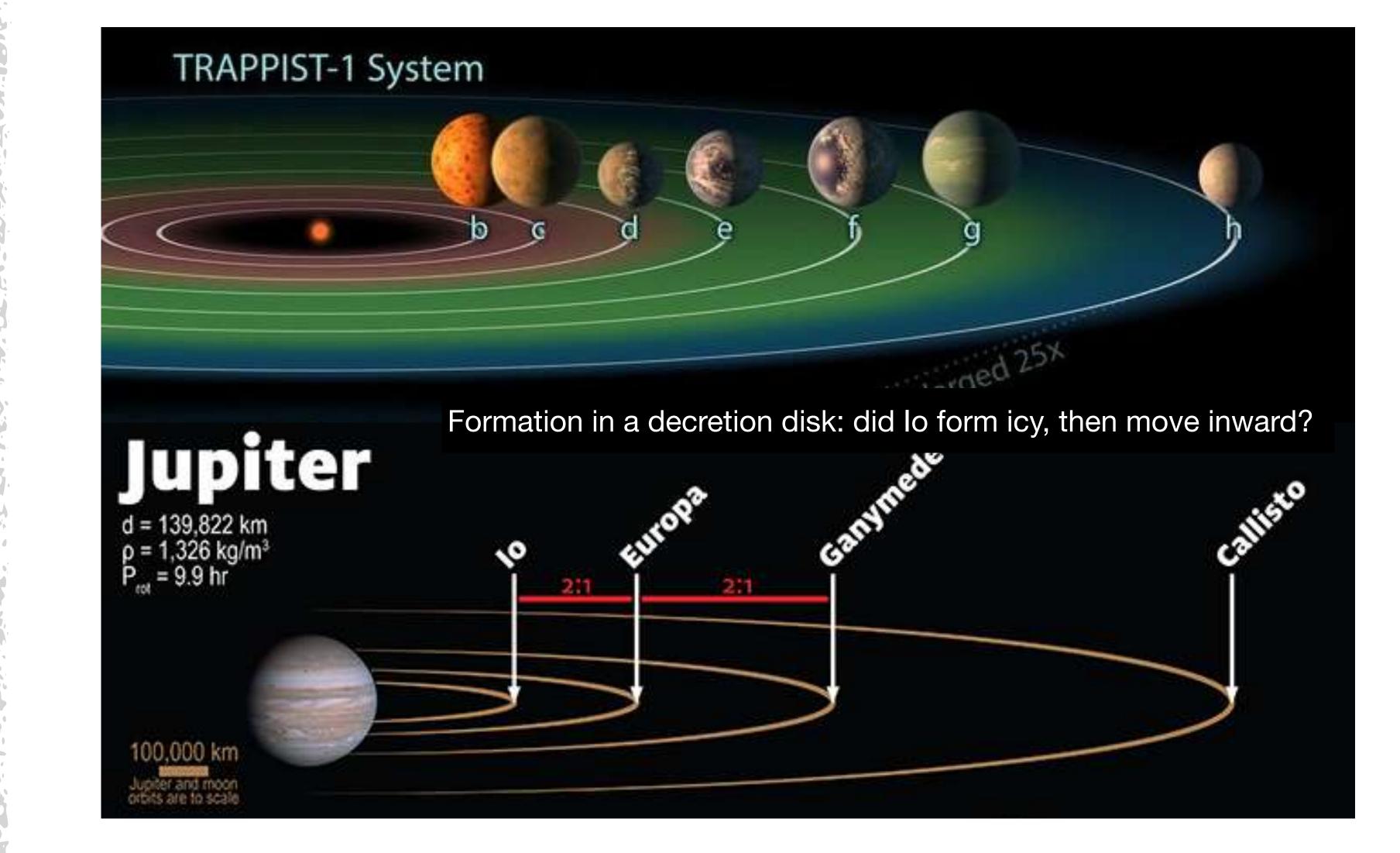


#### Science Objectives: Origins & early evolution of lo, the solar nebular, and Jupiter's CPD. Analog for ancient Earth & exoplanets.





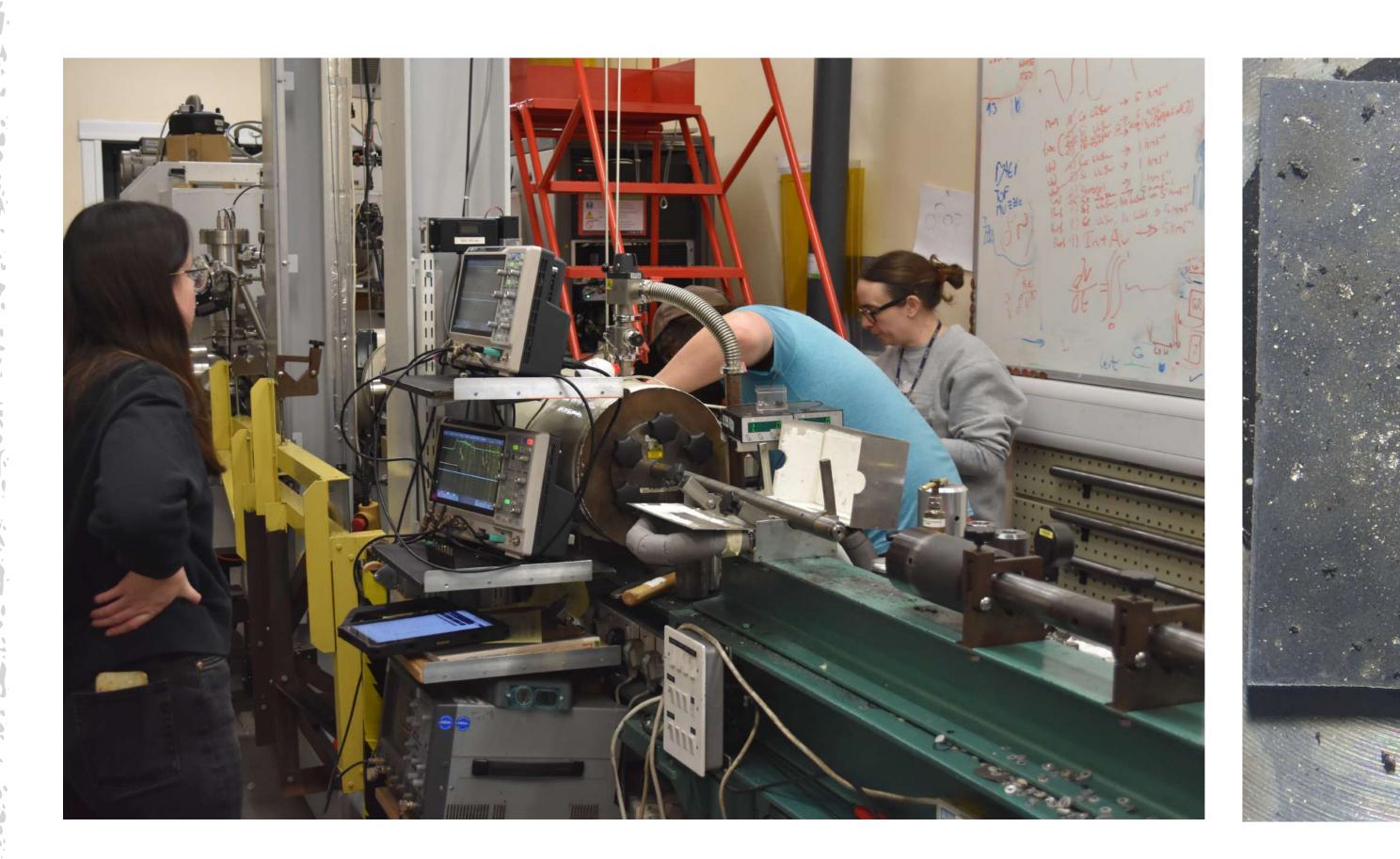




## Mass-dependent fraction from volatile loss

# **Heat-Pipe Planets**

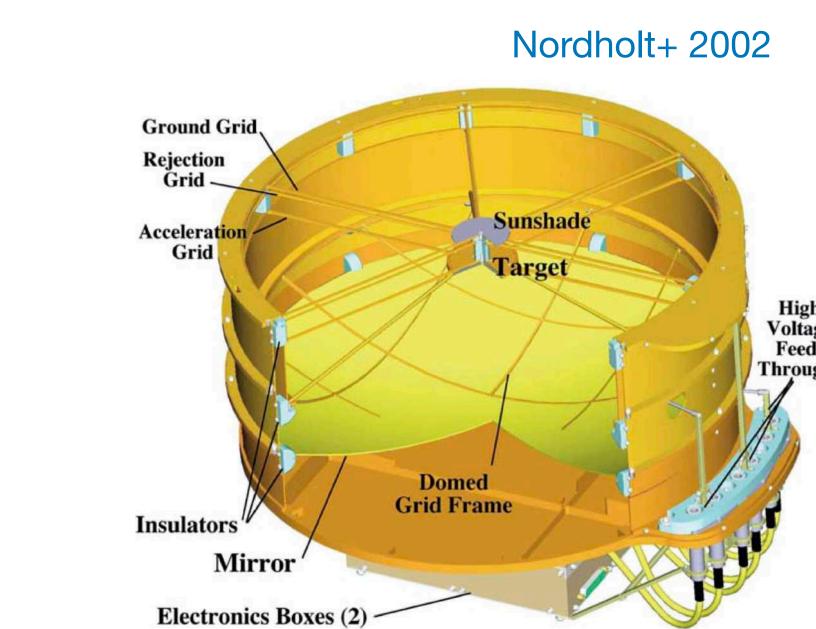
Sample: Hundreds of milligrams of lo plume pyroclastics collected at hypervelocity in pure collectors, gas, and ions.



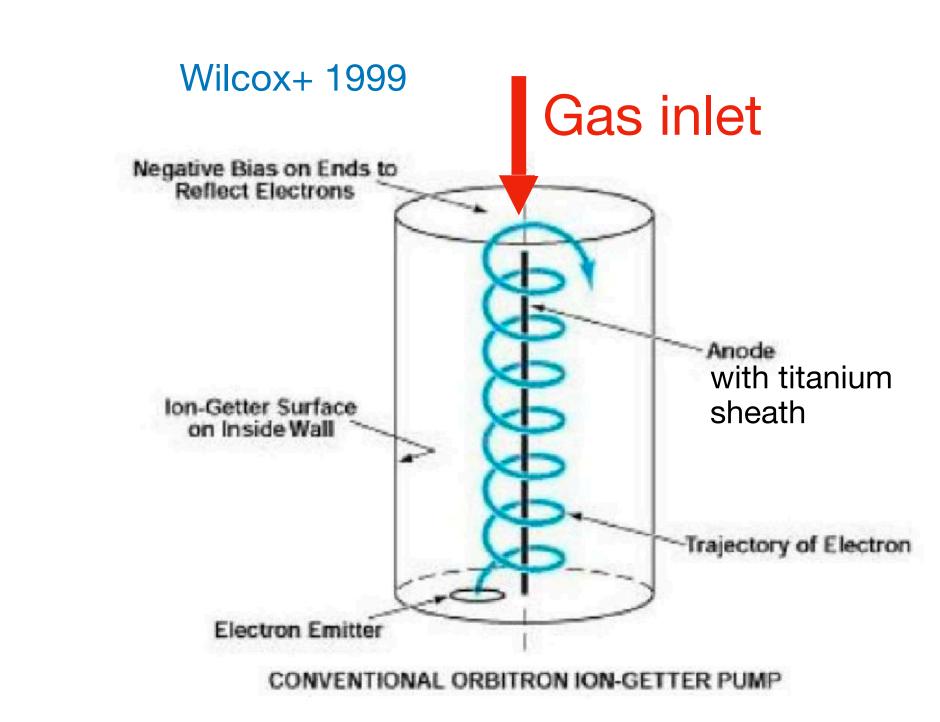
Testing collector materials (light gas gun shots at University of Kent) to minimize fractionation, evaporation, and contamination for different elements.



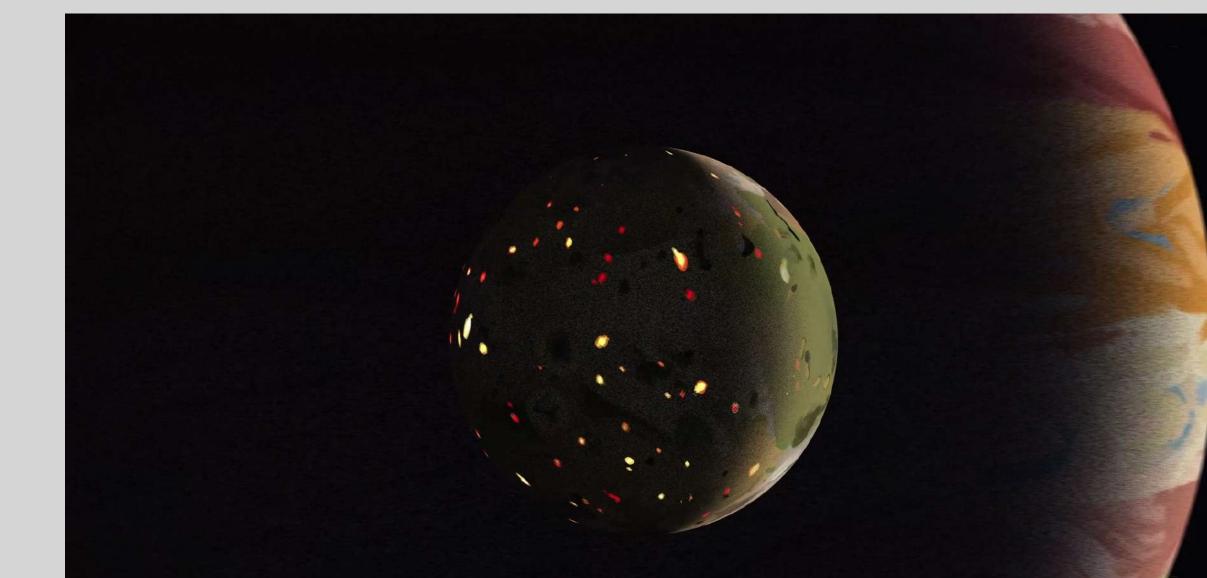
High-precision measurements of isotopes and elements (mostly by solution techniques) → Bulk Silicate Io.

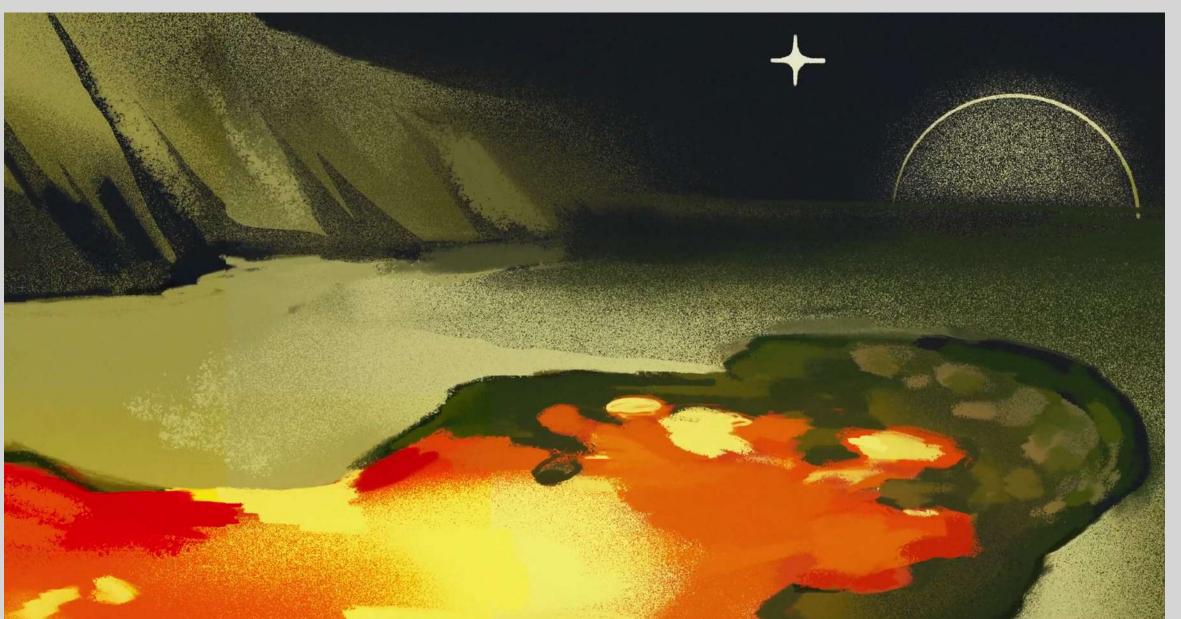


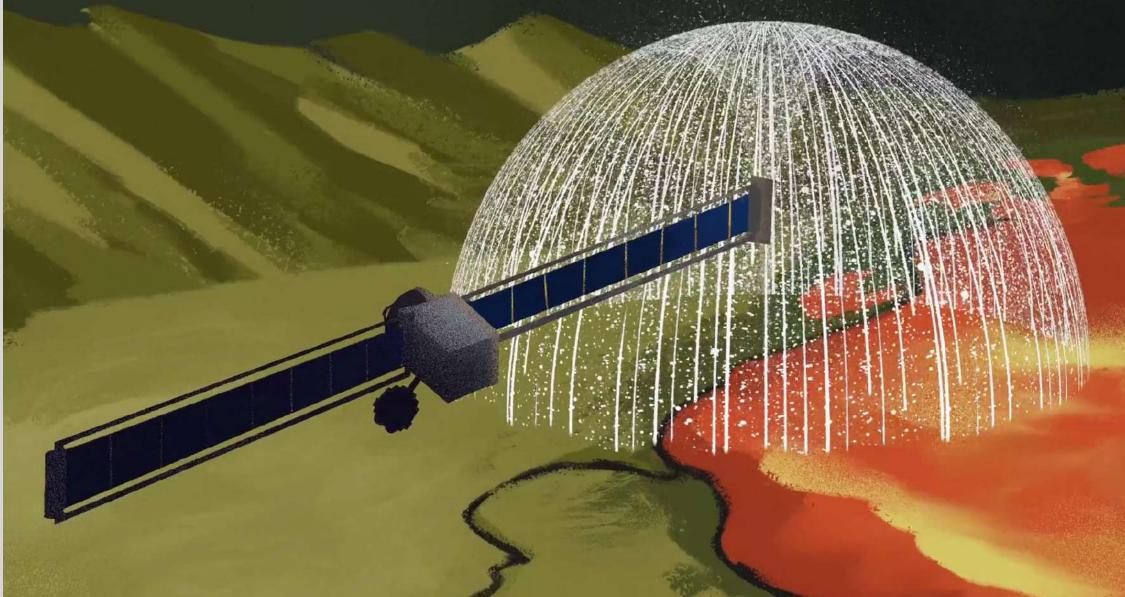
lons from the lo plasma torus collected in pure metal substrates and accelerated by high-voltage grid used in Genesis solar wind concentrator.

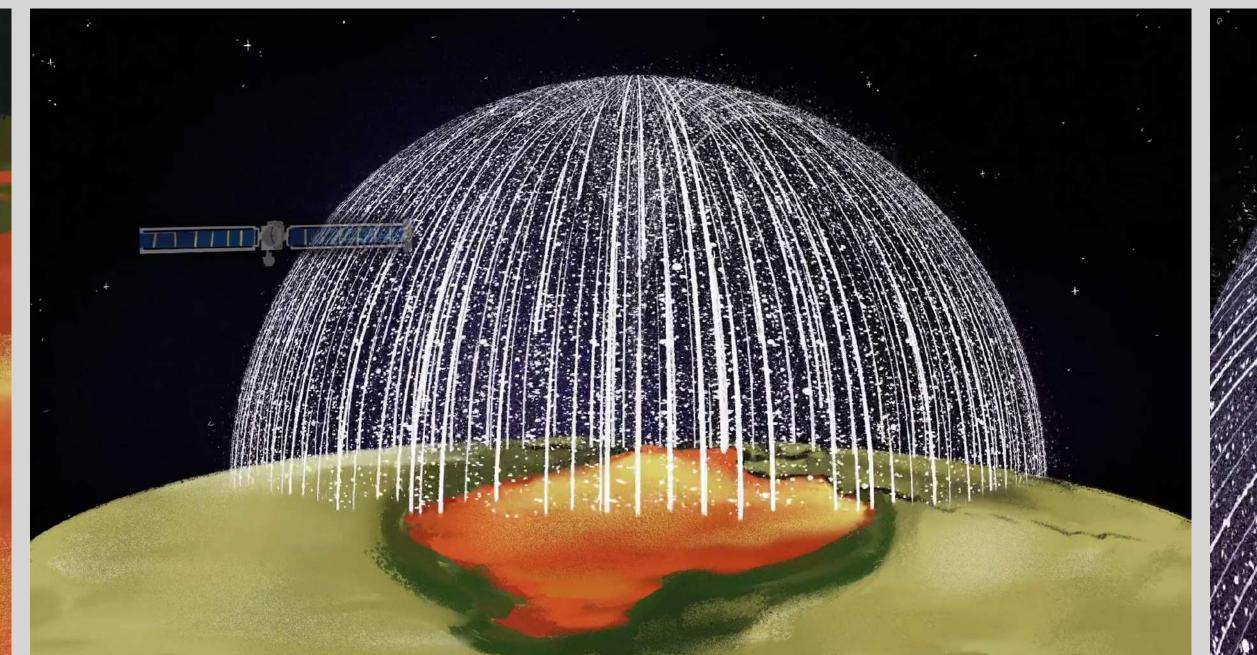


Plume gas collected using a modified orbitron pump, returned and analyzed by Genesis techniques.









lo's atmosphere [this work]

