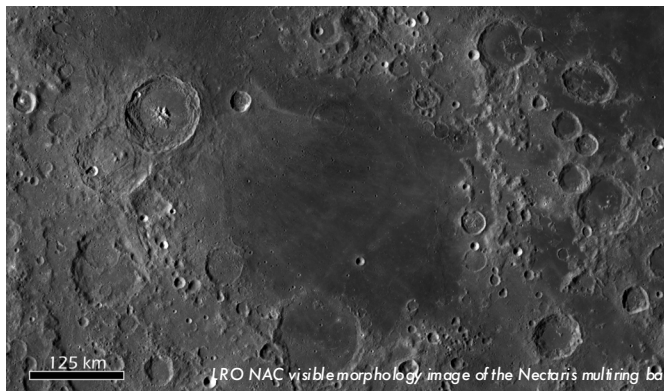


IDENTIFYING AND CHARACTERIZING IMPACT-MELT OUTCROPS IN THE NECTARIS BASIN

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Motivation

- ❖ The formation of the **Nectaris basin** is a key event defining the stratigraphy of the Moon (the Nectarian epoch) and the **onset of the Lunar Cataclysm** and solar-system-wide late heavy bombardment.
- ❖ There is **little agreement on whether current samples** represent Nectaris; sample age estimates range from 3.87-4.2 Ga, or we may not have any samples at all.
- ❖ **No known age for Nectaris = no constraint on Late Heavy Bombardment = no boundary condition for dynamical models of solar system formation!**

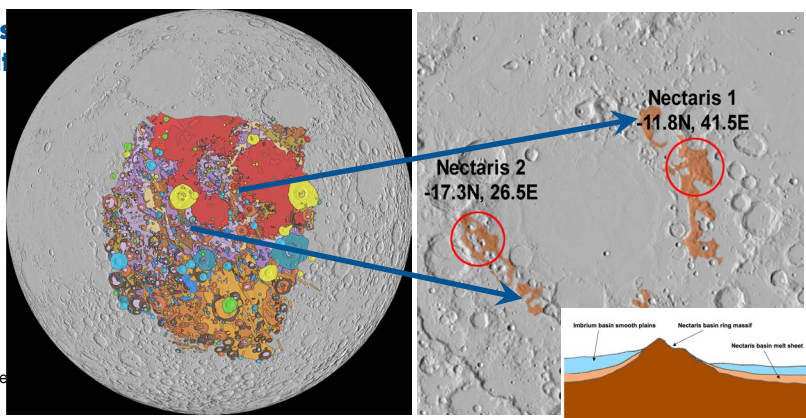


What if we could date Nectaris directly via sample return or in situ dating*?

*See Poster 2046 in this session!

Identifying Nectaris impact melt

- ❖ Small plains near inner basin ring massifs and intermassif "draped" deposits are mapped as Nectaris basin impact melt sheet remnants (Spudis and Smith, 2013), see inset.
- ❖ Impact mixing models (e.g. Petro and Pieters, 2006) indicate no more than 40% of materials should be derived from other large, nearside basins – unlike A16 site.
- ❖ Multiple datasets, including elemental abundances, derived mineral maps, and UV and albedo estimates of glassy materials, can be used to understand the composition of these areas.



Identifying safe landing sites

- ❖ Nearside, mid-latitude location makes a good target for a landed mission.
- ❖ Outcrop areas are broad and very mature (**safe**), reflecting regolith development since Nectaris formation.
- ❖ We are using radar-based surface and subsurface unit mapping and thermal inertia to understand geologic setting.
- ❖ NAC DEM-based small-crater and boulder abundance are being used to better understand where spacecraft could land in these areas and sample surface and subsurface materials.

