Understanding Surface Material on Titan through a Regolith Simulant

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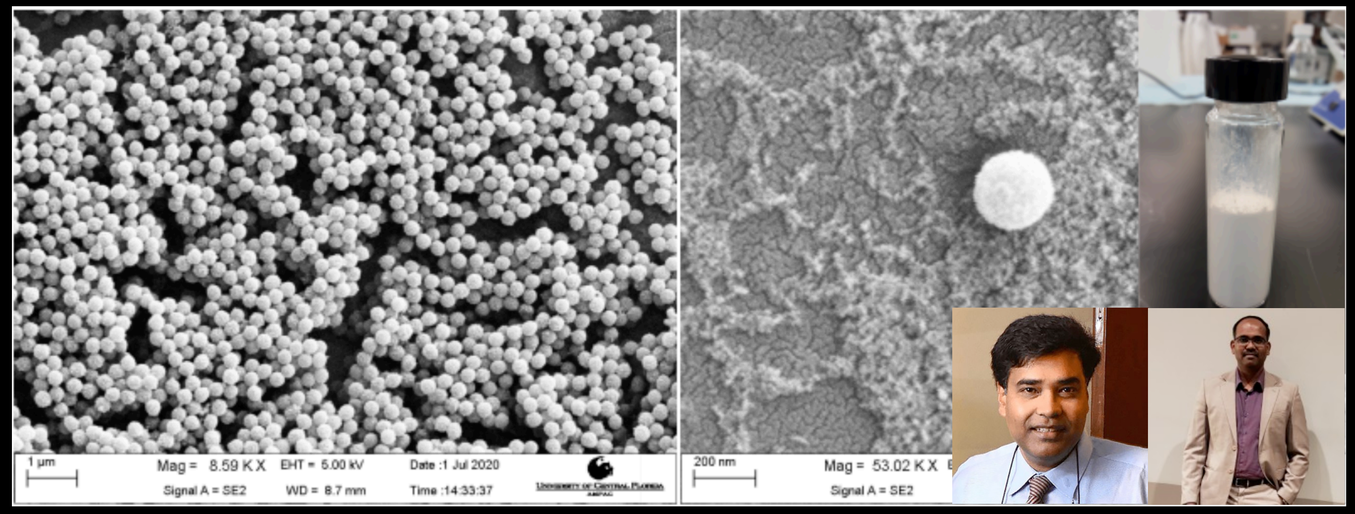
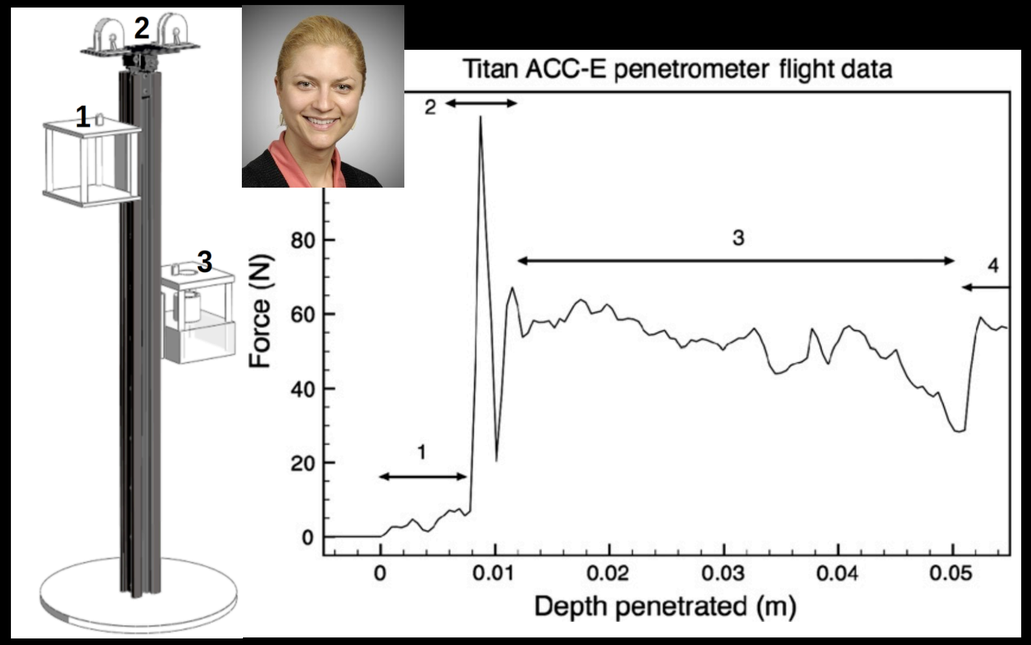


	Laboratory Tholins	Preliminary Simulant
Density	1.0–1.5 g/cm^3	1.2 g/cm^3
Particle size	20-30 µm	0.2 µm
Surface energy	60-70 mJ/m^2	50-60 mJ/m^2
Elastic Modulus	10-15 GPa	18 GPa
Fracture Toughness	0.01-0.03 MPa/m$^{0.5}$	0.1 MPa/m$^{0.5}$

Develop a Titan regolith simulant which:

- Simulate the ***material properties*** of Titan's aerosol analog, "tholin"
- Can be produced in ***bulk quantities***
- ***Non-toxic*** (compared to "tholin")



The Titan regolith simulant would **enable a variety of new non-chemical laboratory investigations** which requires bulk amount of materials.

We will perform the **first experimental study** of the **Huygens penetrometer experiments** with impact speeds, target properties, gravity, and temperature applicable to Titan. The goal is to constrain **surface material composition** at the Huygens landing site.

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