

Tuesday Morning, May 13, 2025

Exhibitors Keynote Lecture

Room Town & Country A - Session EX-TuM

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Moderator: Johanna Rosen, Linköping University, Sweden

11:00am EX-TuM-1 Surface Engineering and Rocket Science –Surface Engineering Solutions to Protect Spacecrafts and Ground Infrastructure Against Terrestrial and “Extraterrestrial” Harsh Environments, *Juan Flores Preciado* [Juan.FloresPreciado@spacex.com], SpaceX, USA **INVITED**

Spacecrafts (rockets, probes, satellites) and ground support equipment (launch pads) are constantly exposed to harsh environments. From a corrosive and aggressive climate to high temperature engine plumes. Launch pad infrastructure (particularly materials surfaces), must be protected to maintain mission's reliability and safety. Satellites and other spacecrafts are exposed to even harsher environments such as: ultrahigh vacuum, atomic oxygen, thermal cycles, radiation and debris impacts.

Understanding how harsh environments affect the properties of materials and the functionality of complex mechanisms is crucial to advance space exploration and return humans to the moon and beyond. In this talk, we will discuss how these environments can be characterize, how they can affect the integrity of structural materials and even modify tribological and corrosion mechanisms. Protective solutions based on surface engineering technologies will be presented and the importance of preparing the next generation of space materials engineers will be highlighted.

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