

Expanding Space Research Through Collaboration

A new era in the understanding of icy bodies in the Solar System

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The trans-Neptunian objects (TNOs), Oort cloud comets, and icy moons of giant planets stand as primary reservoirs of ices within our Solar System. Formed in the coldest regions of the protoplanetary disk, they are the progenitors of the short-period comets. Decades of ground- and space-based observations of comets, as well as spacecraft exploration, have uncovered a plethora of molecular species, shedding light on the intricate chemistry at play.

Simultaneously, ices serve as essential carriers of volatiles within protoplanetary disks, playing a critical role in deciphering the chemical processes that ultimately govern the organic makeup of planets and their atmospheres. The distribution of CHONS ices during the formation of planets within protoplanetary disks leaves a distinct imprint on the composition of icy bodies such as TNOs, centaurs, or Trojans. Finding the inventory of ices in the transneptunian population is a piece missing in the understanding of the ice lines in protoplanetary disks. But ices have remained elusive, until now! Recent advancements in instrumentation, particularly with the James Webb Space Telescope (JWST), signify a new era in our understanding of icy worlds. The JWST's cutting-edge capabilities enable us to dig deeper into the compositions of the small bodies in the Solar System. In this presentation, I will delve into some of the initial findings from various JWST observing programs, offering insights into the surface composition of a diverse sample of icy bodies. From small, red, cold classical bodies akin to Arrokoth, to the enigmatic icy dwarf planets, cold giants with a warm

heart like Eris, Makemake, and Pluto, the JWST promises to unravel the mysteries surrounding these celestial entities, paving the way for a deeper understanding of our Solar System and beyond.

About the Presenter

Dr. Pinilla-Alonso received her Ph.D. from the Universidad de La Laguna of Tenerife, Spain. After that, she had different postdoctoral positions at NASA Ames Research center, Moffett Field, USA, at the Instituto de Astrofísica de Andalucía, Granada, Spain, and at the University of Tennessee, Knoxville, USA. In 2015, she joined the Florida Space Institute of the University of Central Florida as a visiting scientist before joining it as an Associate Researcher in Planetary Science in 2016. Her work focuses on the study of the surface properties of small bodies in the Solar System. Dr. Pinilla-Alonso was part of the group that first discovered water ice and complex organics on the surface of the asteroid 24 Themis leading the modeling effort. She also has lead numerous international observational campaigns in support of NASA missions such as New Horizons, OSIRIS-ReX, and Lucy. Since 2017, Dr. Pinilla-Alonso is also the Deputy Principal Scientist of the Arecibo Observatory and acts as the Science Manager since December 2018. As such, Noemí supports the director of the observatory in leading a group of 20 scientists at different career levels (from senior scientists to Ph. D students)



Wednesday, September 25, at 03:30 p.m.



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Upcoming Talks/Dates

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10/23/2024

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About the Series

Inspired by UCF's latest Strategic Plan, the Florida Space Institute (FSI) is undertaking new efforts to promote space research at UCF. We are thrilled to continue this Seminar Series this spring focusing collaboration, which highlights the diversity of space-related topics investigated by UCF faculty. From growing plants on the Moon to fighting astronaut osteoporosis to planetary defense nothing is off-limits in these seminars! We cordially invite you to join us to foster new collaboration opportunities and help grow space research at UCF!

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