



# PHYSICS COLLOQUIUM: From Icy Moons to Giant Planets: Exploring the Deep Structure of Solar System Worlds with Tidal Observations

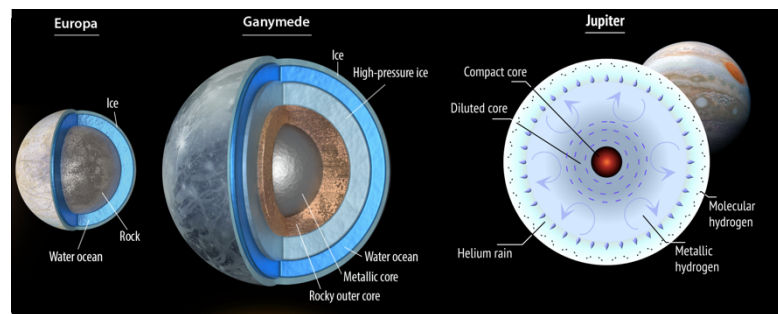
Dr. Benjamin Idini

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## Abstract:

The architecture and diverse environmental conditions of our solar system seem exceptionally rare when compared to other nearby planetary systems in the Milky Way. We lack any version of Super-Earth and Sub-Neptune planets, the most frequently observed exoplanets. Furthermore, we host the only so-far-detected instance of life as we know it. The deep interiors of giant planets and icy moons contain clues to advance our understanding of the features that make our solar system so unique, and simultaneously

provide invaluable context to inform the ongoing exploration of planetary systems beyond our own. Gas giant planets hold relics of the processes responsible for the formation of our solar



system. Meanwhile, icy satellites contain a great abundance of the basic ingredients required to sustain life and have become a priority target for life detection beyond Earth. In this talk, I will present my recent advances in characterizing the deep interiors of the giant planet Jupiter and the icy satellite Titan using tidal observations from NASA missions Juno and Cassini. I will put particular emphasis in discussing the future of planetary interiors exploration in the context of answering questions related to the origin and habitability of our solar system.

## About the Speaker:

Dr. Ben Idini is a planetary scientist and fellow of the UC President's Postdoctoral Fellowship Program (PPFP) in the department of Astronomy and Astrophysics at UC Santa Cruz. In his research, he uses measurements from NASA interplanetary missions to address fundamental scientific questions about how giant planets and icy moons form and evolve. He enjoys approaching challenging problems with creativity and innovative methodologies mostly rooted in geophysics, theoretical physics, and applied mathematics. Dr. Idini is a science team member of NASA missions Juno and Europa Clipper. Dr. Idini received his PhD in planetary science from Caltech in 2022, and his BS and MS in engineering from Universidad de Chile in 2016.

More details about Dr. Idini's research can be found in his website: <https://bidini.github.io/>

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10:30 AM – 11:50 AM

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