

Dare Mighty Things: To Psyche & Beyond

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Deep within rocky, terrestrial planets - including Earth - scientists infer the presence of metallic cores, but these lie unreachably far below the planets' rocky mantles and crusts. Because we cannot see or measure Earth's core directly, Psyche offers a unique window into the violent history of collisions and accretion that created terrestrial planets. The mission Psyche is a journey to the unique M-type (metal-rich) asteroid called 16 Psyche orbiting the Sun between Mars and Jupiter. The Psyche spacecraft includes an imager, magnetometer, a gamma-ray spectrometer, and NASA's Deep Space Optical Communications (DSOC) technology demonstration. In this talk, I will describe my journey from Nebraska to the far reaches of the solar system, the objectives and architecture of the Psyche mission, and my work as an End-to-End Information System (EEIS) Engineer. The EEIS is a virtual system responsible for the data flow and communication architecture through Psyche's subsystems. The system is defined by how the flight, mission, and launch systems work together to enable Psyche's data flows (uplink, downlink, spacecraft, and ground), as well as validate, account for, process, distribute, and store Psyche's data. This data includes spacecraft commands, spacecraft health, and instrument science data. I am specifically responsible for the concept formulation of the information system, its design architecture, as well as the implementation of the Consultative Committee for Space Data Systems (CCSDS) standards in the flight to ground interface to ensure NASA-JPL is able to communicate with the Psyche spacecraft while it is around 370 million kilometers away from Earth.



Bio: Richa Sirohi (she / her) is an End-to-End Information System Engineer at NASA's Jet Propulsion Laboratory. She works on the communications architecture for the Psyche Mission. Richa has previously worked on the Mars Perseverance Rover, the Cold Atom Laboratory, Multi-Angle Imager for Aerosols (MAIA), a Lunar Mission Concept, and Europa Clipper. She also founded JPL's Early Career Community for young professionals. Richa studied Mechanical Engineering at Baylor and went on to complete a Master's from Cornell University in Systems Engineering with an emphasis on Aerospace Systems and research in Soft Robotics (2019). She is currently pursuing a part-time Master's in Engineering Management from Cornell University while also working full-time at JPL. Richa is a South Asian American from Omaha, Nebraska and is also the host of a diversity-centric, storytelling podcast celebrating the people who make space exploration possible--*Space People*. She is passionate about building diverse communities, a long-lasting, equitable work culture, engaging in educational outreach in schools, mentoring student interns, and inspiring young women to pursue careers in STEM. Richa was the 2021 recipient of the NASA-JPL Bruce Murray Award for her work in educational outreach. She also enjoys cooking, racquetball, writing papers, attending classical concerts, photography, traveling, and exploring nature.