

EUROPA JUPITER SYSTEM MISSION TRANSCRIPT

2-11-09

Title: The Europa Jupiter System Mission

Robert Pappalardo, Europa Orbiter Study Scientist

Can there be life elsewhere? Where are the habitable environments in our solar system?

Mars is an obvious place to think about, but so are the icy worlds of the outer solar system; where beneath their surfaces there may be liquid water oceans.

The Europa Jupiter System Mission is a partnership between ESA and NASA to send two spacecraft to the Jupiter system; one to orbit Europa, the other to orbit Ganymede, to understand what we're phrasing as the emergence of habitable worlds around gas giants.

Title: The Europa Jupiter System Mission will study Jupiter's four largest moons

Robert Pappalardo, Europa Orbiter Study Scientist

The subsurface oceans are certainly the key driver for exploration of these worlds.

Europa is a fascinating place with an ocean that might be only tens of kilometers below the surface and they communicate actively with the surface through eruptions, through icy convection -- blobs of warm ice moving up to the surface through cracking, the breaking of the ice.

So there could be signs on the surface of what's going on deep down below the surface.

So what we can do with a spacecraft in orbit around Europa is measure how Europa flexes, as it's stretched by Jupiter's gravity.

That tells us something very specific about how stiff that ice shell is, and by how stiff it is we can get a measure of its thickness.

Europa is a maybe rarer example of an ocean in contact with a rocky mantle.

Ganymede actually might be a more common example of an ocean where it's an ocean sandwich; ice above and below.

Callisto, a relatively dead world, has not the amount of activity that Europa and Ganymede have, yet we think that Callisto has an ocean beneath its surface.

It's not out of the question that if there are liquid water oceans down there and there's heat and there's energy, that there could possibly be life.

The Europa spacecraft will make three or four close flybys of Io, the most volcanically active world in our solar system. In fact, we might even be able to fly through one of these volcanic plumes and sample the material that's spewing out.

And we're not going to forget the big guy either, Jupiter. We're going to be able to make observations of Jupiter and its rings as we orbit for about two years.

What's really compelling about these worlds is our search for whether there is life elsewhere, not just in the solar system but in the universe. Can these be habitable environments? That's really what drives these worlds to the top of the list of places to explore.

**Title: Jet Propulsion Laboratory
California Institute of Technology**