

US plans to answer the lure of Europa

November 10 2014, by Helen Maynard-Casely



Can you hear it calling you? The beautiful surface of Europa. Credit: NASA/JPL/Ted Stryk

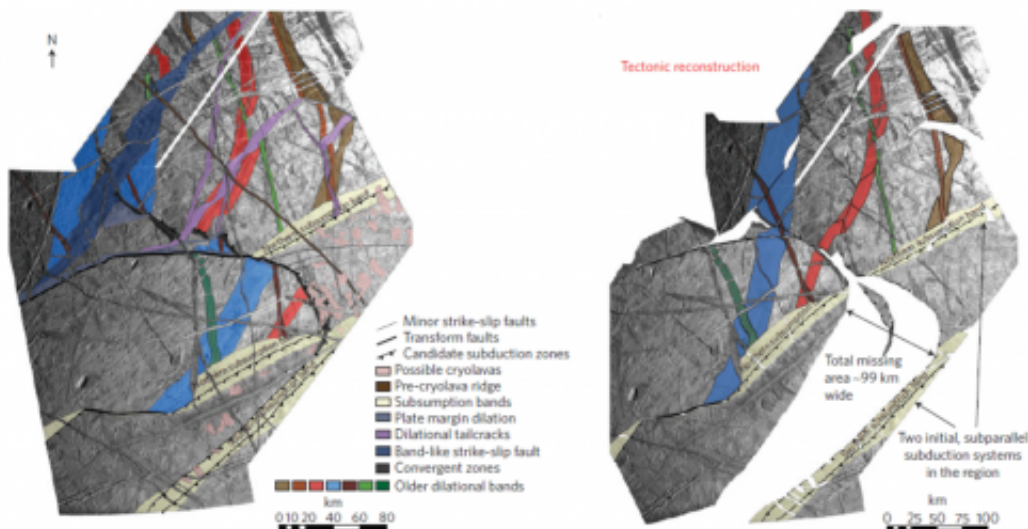
To planetary scientists Jupiter's icy moon Europa is a Siren, calling out to them across the solar system. With its youthful surface, abundance of water and the tantalising evidence of a moon-wide ocean – it is one of the best chances for us to find life [within our solar system](#). Last week the Europa Clipper mission [won some critical support of US congress representatives](#), who attended a meeting organised by the Planetary

Society called 'The lure of Europa'.

But it hasn't been 'plain sailing' for the [Clipper mission](#). In 2013 the planetary science community gathered and put out a decadal plan, citing the exploration of Europa as one of its highest objectives. However, cuts to funding for 'outer' planetary research in favour of Mars and the [manned space program](#) left many dispirited. The community have powered on, investing energy in lobbying policy makers, and now traction for the Europa mission is building.

So why go back?

Just in the past year there have been two remarkable insights made about Europa, only making its Siren call louder. The first of these was that the Hubble Space Telescope spotted evidence that [geysers were shooting up into space](#) from the moons surface. This immediately put Europa in a rather elite category of [planetary bodies](#), ones that we have observed to be doing things! Now along with the 'Tiger Stripes' of Enceladus, sulfur volcanoes of Io and magic islands of Titan – the geysers of Europa show that this moon is more than a passive snowball.

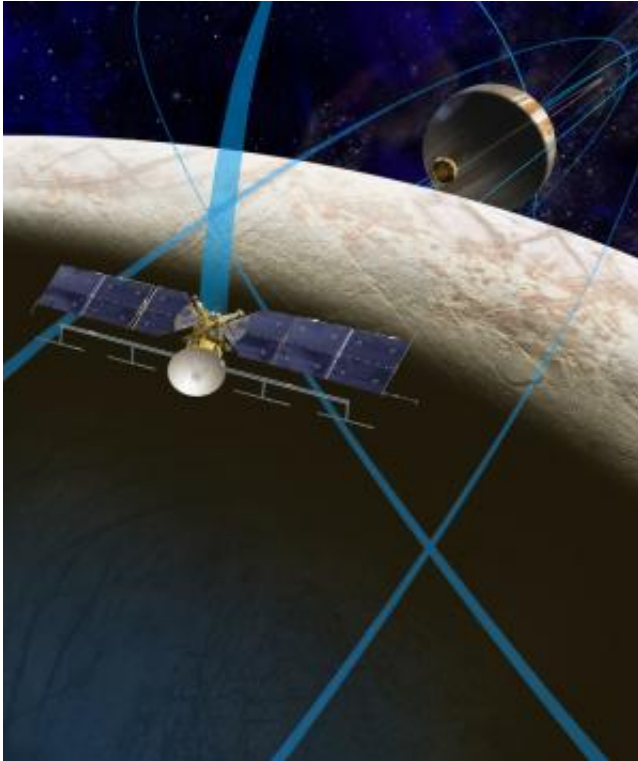


Finding the missing pieces of Europa's crust, this image shows the tectonic reconstruction of part of the surface. NASA/JPL/S. Kattenhorn

The second insight has been a paper that did a 'reverse jigsaw puzzle' study of Europa's surface. Since the Galileo mission returned its startling images of the surface of Europa, the features that were most obvious were extensional. Analogous to the mid-Atlantic ridge, these features were interpreted to be extending the ice crust.

The issue was, though, that nobody could see where the crust had contracted to compensate for this. Putting aside the thought that Europa had just got bigger, a recent paper has picked up on a number of [lines of evidence for subduction on Europa](#). On Earth, subduction is one of the main ways the giant plates of crust are destroyed, with one plate being forced under the other. Among the evidence that was picked up from the Galileo images – was the mismatch of features on the surface, leaving the researchers to identify the missing 'pieces' of crust that had been pushed under.

Both of these insights have highlighted the fact that Europa's surface and interior are linked and there are ways and means that material can be brought to the surface from the interior and vice versa. There's not proof yet that this would extend to the potential ocean below, but it's tantalising that maybe it hasn't been locked away from outside influences.



The Europa Clipper probe, zipping past the icy moon. Credit: NASA/JPL

For me, Europa has currently lured me away from home in Australia to Japan. For the next three months I'll be based at the University of Tokyo where I'm currently recreating bits of Europa in the lab, using high-pressure and low temperature equipment. Chiefly what I'm interested in, is how possible impurities from Europa's sister moon Io could effect water-ice under these conditions.

Will Clipper be scooping up the European surface to investigate the ice crust and its impurities directly? Sadly not, there are no plans for a lander in the Clipper mission. This is mostly because we don't have good enough images of the [surface](#) to plan this yet. But the fly-bys that are currently being planned for Clipper would add greatly to the potential of this happening, with audacious plans to have a lander that could then burrow through the ice.

But until about 2020, when the hope is that Clipper will launch towards the Jupiter system, there's a lot of time for me to do experiments yet!

This story is published courtesy of [The Conversation](#) (under Creative Commons-Attribution/No derivatives).

Source: The Conversation

Citation: US plans to answer the lure of Europa (2014, November 10) retrieved 9 April 2024 from <https://phys.org/news/2014-11-lure-europa.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--