



## Unmasking Europa: The search for life on Jupiter's ocean moon

by Richard Greenberg

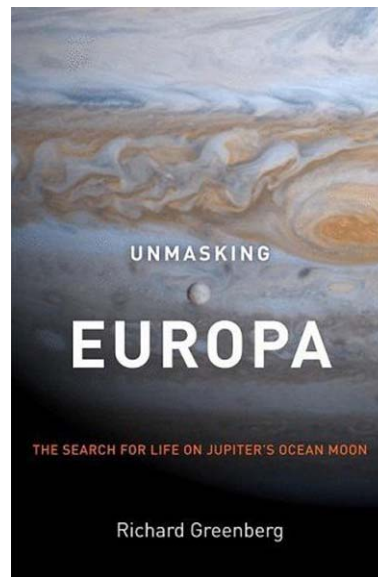
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Europa does not get much publicity nowadays, since the *Galileo* orbiter ended its mission and the *Cassini* spacecraft focused attention on Titan and Enceladus instead. But this large moon, almost certainly covered in a global ocean of water below its solid ice crust, is still one of the most fascinating of worlds, and well worth a book to itself - especially as most of the images and analysis were produced in the later stages of the *Galileo* mission with little attendant publicity. This book is a shorter and less technical adaptation of an earlier volume by the same author, who is professor of planetary science at the University of Arizona, and a long-standing member of the science teams both for *Galileo* and for the future Europa mission.

However, the burden of the book is that he was very much a marginalised member, and that more well-connected scientists on the team wielded excessive influence not only in the mission planning process, but also - a more serious accusation - in the selective presentation of the science. The issue is the thickness of the ice crust. According to NASA dogma it is at least 20km thick and never broken. According to the author, it is less than 10km thick and - most importantly - it frequently cracks or melts in

patches to allow the ocean access to the surface. This, of course, has implications for the possible nature of life within the ocean. Most of the book is a very clear and accessible exposition of the Europa observations, and of how movements of the ice crust could have produced them.

When the author deals with more personal aspects of the controversies, one has to wonder what the view from the other side would be, if those accused chose to reply in kind. For instance, is it really fair to classify so many published works on the topic as either 'objective presentations' (which agree with us) or 'amazing contortions to get on the bandwagon'? But many readers will appreciate his sharp thrusts at various targets, such as the combative rituals of the NASA planning process, or the decrees on naming features by the 'IAU nomenclatura', or the myth of 'cryovolcanism'. 'Cryovolcanism' was a dominant NASA dogma throughout the *Galileo* mission (a prominent team member



'needed to take pictures of his nonexistent lava flows', says the author) - and it still is, as one can read in any recent press release about Titan, even though there is no evidence that cryovolcanism exists on any world. Anyway, the author is gratified that his 'thin-ice' model of Europa is now gaining credence, which may well indicate, as he believes, that correct arguments must ultimately win over the scientific community.

Debate may continue for years until the arrival of the next (just-

approved) international spacecraft at Europa. In the meantime, this book can be recommended as a good non-technical synopsis of our present understanding of the satellite, and a rare insight into the rivalries behind the scenes.

### John Rogers

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