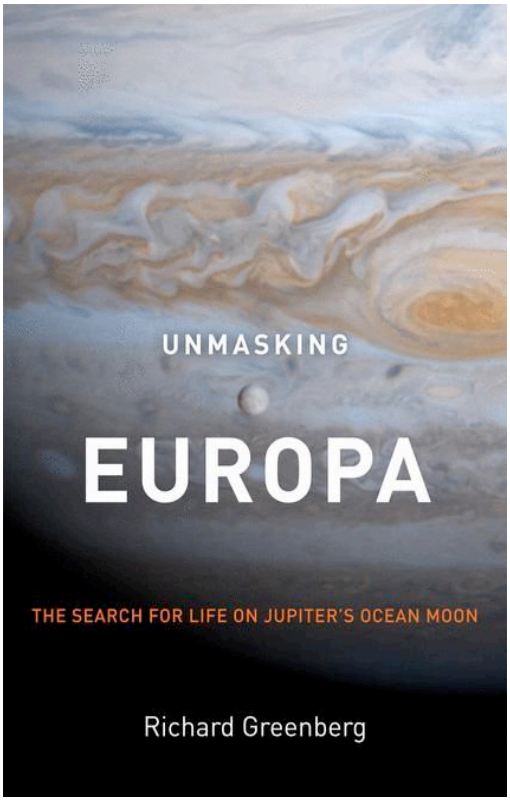

Richard Greenberg
University of Arizona, Lunar and Planetary Laboratory, Tucson

Unmasking Europa:

The Search for Life on Jupiter's Ocean Moon

A Close Look at Europa . . .

And How Big Science Gets Done . . .

The second-largest of Jupiter's four major moons, Europa is covered with ice, as confirmed in views from modern telescopes and the thousands of images returned by NASA's Voyager and Galileo missions. But these higher-resolution views also showed that the ice is anything but smooth. In fact, Europa's surface is covered with vast criss-crossing systems of mountain-sized ridges, jumbled regions of seemingly chaotic terrain, and patches that suggest upwellings of new surface materials from below. How scientists think about the underlying forces that shaped this incredibly complex, bizarre, and beautiful surface is the subject of this book.

In *Unmasking Europa*, Richard Greenberg tells the story of how he and his team of researchers came to believe that the surface of Europa is in fact a crust so thin that it can barely hide an ocean of liquid water below. He shows how the ocean is warmed by the friction of tidal movements in this small moon as it orbits around immense Jupiter. The implications of this interpretation—which includes the idea that there are active intermittent openings from the liquid ocean to the frozen surface—are immense. The warmth, the chemistry, and the connections from ocean to surface provide the conditions necessary for the existence of life, even at this relatively remote locale in our solar system, far beyond what's normally thought of as its 'habitable zone.'

Unmasking Europa describes in clear but technically sophisticated terms – and with extensive illustrations (including more than 100 NASA images) – the remarkable history of research on Europa over the last four decades. The book also provides unique insights into how "big science" gets done today, and it is not always a pretty picture. From his perspective as professor of Planetary Science at the University of Arizona, and a quarter century-long membership on the Imaging Team for NASA's Galileo mission, Greenberg describes how personal agendas (including his own) and political maneuvering (in which he received an education by fire) determined a lot about the funding, staffing, and even the direction of the research about Europa.

At the same time, the book captures the excitement and satisfaction of discovery as Greenberg's team came to understand how the character of Europa makes it, perhaps, the most likely place for us to finally encounter extra-terrestrial life.