EUROPA. R. T. Pappalardo, Jet Propulsion Laboratory, California Institute of Technology, Mail Stop 321-560, Pasadena, CA 91109.

Europa is an astrobiological and geophysical wonderland. Galileo spacecraft data suggest that a global ocean exists beneath its frozen ice surface. Specifically, magnetometry data indicates an induced magnetic field at Europa, implying that a salt-water ocean exists today. A paucity of large craters argues for a surface on average only ~40–90 Myr old, and two multi-ring structures suggest impacts punched through an ice shell ~20 km thick. Europa's ocean and surface are inherently linked through tidal deformation of the floating ice shell. Processes whih defom the ice shell (notably tidal flexing, nonsynchronous rotation, and polar wander) may generate stresses that fracture and deform the surface to create fractures, ridges, and bands. Dark spots, domes, and chaos terrain are probably related to tidally driven ice convection, along with partial melting within the ice shell. Europa's geological activity and probable ocean-mantle contact may permit the chemical ingredients necessary for life to be present within the satellite's ocean. Fascinating geology and geophysics, combined with high astrobiological potential, make Europa a top priority for future spacecraft exploration.