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Abstract

Exploring Europa

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Jupiter's moon Europa may be a habitable world. Galileo spacecraft data suggest that an ocean lurks beneath its frozen ice surface. A paucity of large craters argues for a young surface and recent geological activity, and magnetometry confirms that a salty ocean persists today. Europa's ocean and surface are inherently linked. Tidal deformation of the floating ice shell generates stresses that fracture and deform the surface to create ridges and bands. Dark spots, domes, and chaos are probably related to tidally driven ice convection and partial melting. Europa's activity permits the "ingredients" necessary for life to be present within the satellite's ocean. Astonishing geology and high astrobiological potential make Europa a top priority for future spacecraft exploration.

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