

# Webb Finds Carbon Source on Surface of Europa

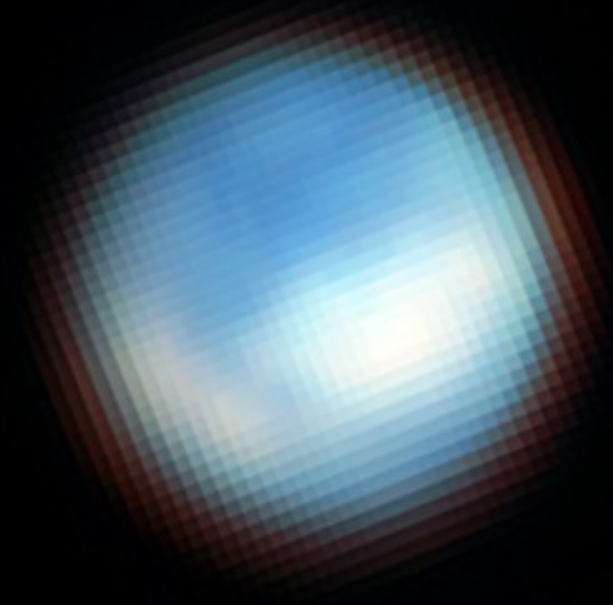


A team led by Goddard scientists used data from NASA's James Webb Space Telescope to identify carbon dioxide (CO<sub>2</sub>) in a specific region on the icy surface of Jupiter's moon Europa.

Analysis indicates that this carbon likely originated in the subsurface ocean and was not delivered by meteorites or other external sources. Moreover, it was deposited on a geologically recent timescale in a region called Tara Regio – a geologically young area where the surface ice has been disrupted and there likely has been an exchange of material between the subsurface ocean and the icy surface.

Carbon dioxide isn't stable on Europa's surface due to the intense radiation present in Jupiter's magnetosphere. Therefore, the scientists say it's likely that it was supplied on a geologically recent timescale – a conclusion bolstered by its concentration in a region of young terrain.

This discovery has important implications for the potential habitability of Europa's ocean. Understanding the chemistry of Europa's ocean will help us determine whether it's hostile to life as we know it or if it might be a good place for life.



*NIRCam (Near Infrared Camera) image from the James Webb Space Telescope of the surface of Jupiter's moon Europa. The white features correspond with the chaos terrain Powys Regio (left) and Tara Regio (center and right), which show enhanced carbon dioxide ice on the surface. Image credit: Gerónimo Villanueva (NASA-GSFC), Alyssa Pagan (STScI)*