

# **RIFTS: Role of Icy FracTured Surfaces.**

*Unveiling the hidden subsurface through fractal, structural  
and compositional analyses*

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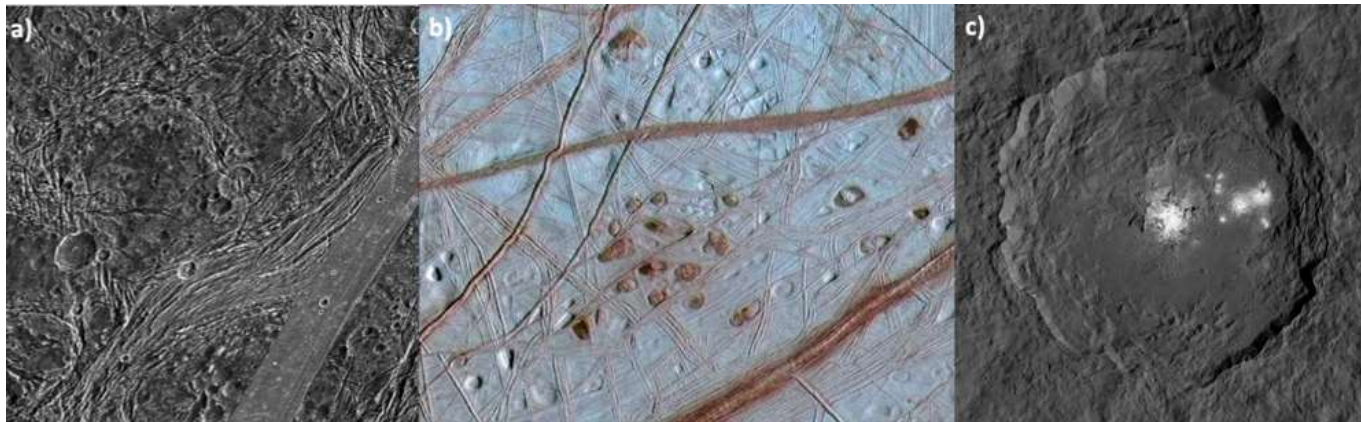


## RIFTS | Objective

The investigation of **surface fracture systems** located on icy bodies can reveal new insights into their evolution and physical characterization.

Fractures penetrating the entire thickness of the shell may serve as **fluid pathways connecting the subsurface reservoirs to the surface**.

Analyze fractures located on Ganymede, Europa and Ceres, by means of a fractal, structural and compositional analysis



## RIFTS | Analysis

Fractures and/or vents (i.e. points of gas and/or fluid emission) will be mapped on the images available in order to derive their global and regional distribution

Fractal analysis

**determine the depth at which a liquid or frozen ocean is located (or water pockets). This will also reveal the different mechanical behavior of internal structure layers.**

Structural analysis

**infer the stress fields responsible for fractures development and the role of fractures in fluid circulation, providing further insights into icy body's interior**

Compositional analysis

**characterize the material in close proximity to the fractures or constituting vents and, in turn, infer the internal mineralogical composition (study specific ROI encompassing fractures and perform high-resolution geological maps that will be correlated with compositional results).**

The analyses will be performed on **selected sites of icy bodies**, such as highly fractured regions on Ganymede, regions showing cryovolcanic features (i.e. chaos and lenticulae) on Europa and flat floored craters (i.e. Dantu and Occator craters) on Ceres.

The proposed research will:

- i) integrate different skills to maximize the scientific return of the bodies under study,**
- ii) conduct a multidisciplinary analysis in order to define a global characterization of bodies with subsurface reservoir,**
- (iii) provide scientific findings that could be useful in supporting the observation campaign of future mission exploration.**

RIFTS

*THANK YOU*

