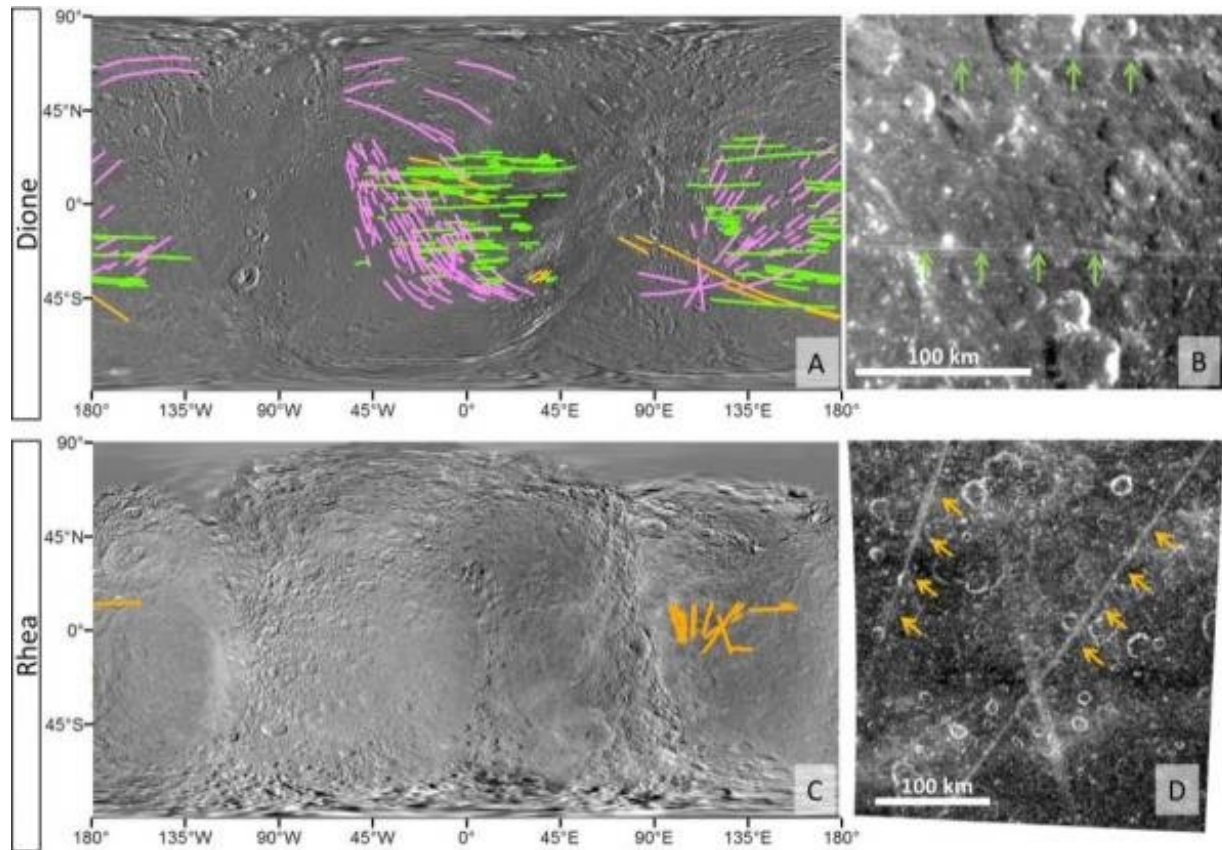


# Saturn's moon Dione covered by mysterious stripes

October 25 2018, by Alan Fischer



Distribution of linear virgae on Dione and Rhea. Shown are the distribution of linear virgae (green) crater rays (pink) and candidate linear virgae (orange) a. Global distribution of linear virgae, crater rays, and candidate linear virgae on Dione. b. Detailed view of linear virgae (green arrows) on Dione. Image No. N1649318802 centered at 22°W, 10°N. c. Global distribution of candidate linear virgae on Rhea. d. Detailed view of candidate linear virga. Credit: ( A) Basemap from Roatsch et al, 2008. (B) Image No. N1649318802. (C) Basemap from

Roatsch et al, 2012. (D) Image No. N1673420688.

Mysterious straight bright stripes have been discovered on Saturn's moon Dione, says research by Planetary Science Institute Associate Research Scientist Alex Patthoff.

The origins of these linear virgae (virgae meaning a stripe or streak of color) are most likely caused by the draping of surface materials like material from Saturn's rings, passing comets, or co-orbital moons Helene and Polydeuces.

"The evidence preserved in the linear virgae has implications for the orbital evolution and impact processes within the Saturnian system," Patthoff said. "Plus, the interaction of Dione's surface and exogenic material has implications for its habitability and provides evidence for the delivery of ingredients that may contribute the habitability of ocean worlds in general."

Patthoff and Emily S. Martin of the Center for Earth and Planetary Studies at the National Air and Space Museum, are co-authors on a new paper "Mysterious linear features across Saturn's [moon](#) Dione" that appears in the journal *Geophysical Research Letters*. They studied images from NASA's Cassini spacecraft, which also revealed similar features on Saturn's moon Rhea.

Dione's linear virgae are generally long (10 to 100s of kilometers), narrow (less than 5 kilometers) and brighter than the surrounding terrains. The stripes are parallel, appear to overlie other features and are unaffected by topography, suggesting they are among the youngest surfaces on Dione.

"Their orientation, parallel to the equator, and linearity are unlike anything else we've seen in the solar system," Patthoff said. "If they are caused by an exogenic source, that could be another means to bring new material to Dione. That material could have implications for the biological potential of Dione's subsurface ocean."

**More information:** Emily S. Martin et al. Mysterious linear features across Saturn's moon Dione, *Geophysical Research Letters* (2018). [DOI: 10.1029/2018GL079819](https://doi.org/10.1029/2018GL079819)

Provided by Planetary Science Institute

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