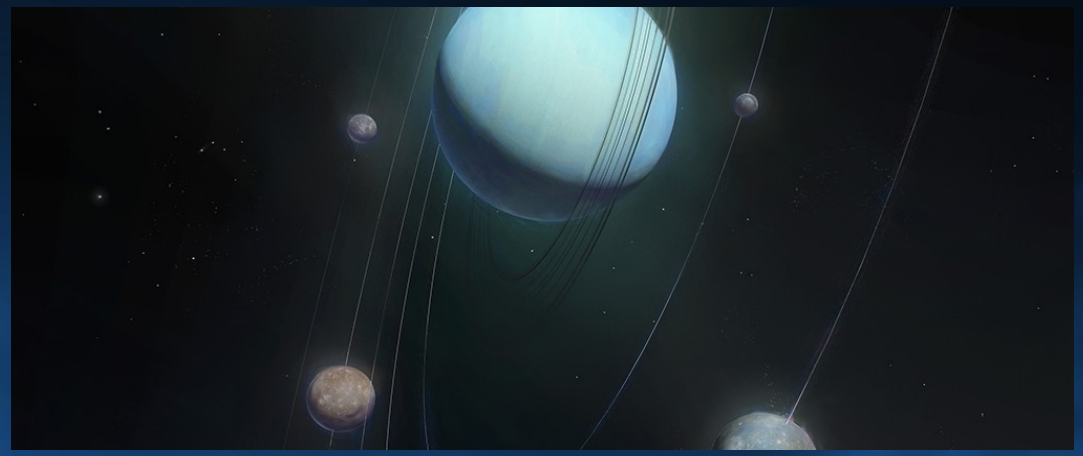
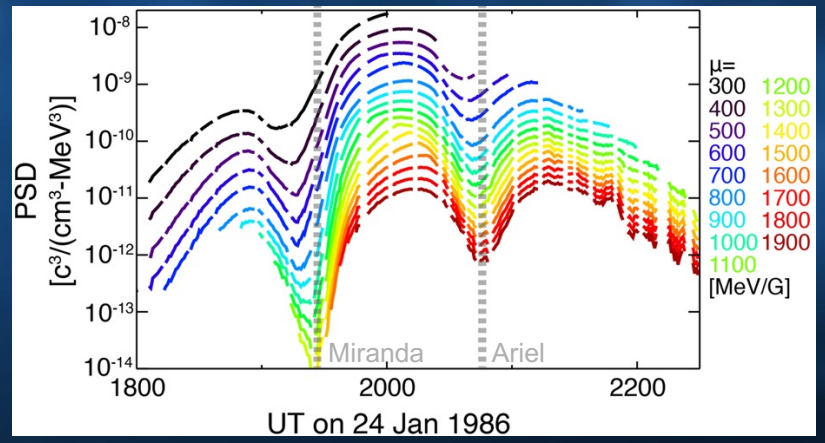
Radiation Data Suggests Two of Uranus' Moons May Harbor Active Oceans



An artist's impression of Uranus and four of its five largest moons (left to right) Oberon, Titania, Miranda, and Ariel.



A new analysis looking at the "phase space density" of energetic ions observed by Voyager 2 found a clear maximum, suggesting a source of these particles between Ariel and Miranda.

New analysis of the three-decade-old observations from Voyager 2 at Uranus have revealed a mysterious source of energetic ions in the planet's magnetosphere.

- The Low-Energy Charged Particle (LECP) instrument on Voyager 2 observed curious angular and energy distributions of energetic ions near Uranus.
- New modeling of the expected behavior of such energetic particles shows that sustaining such a population requires a very strong source and specific energization mechanism.
- This suggests that the ions are originating from either Miranda and/or Ariel. This potentially hints that the Uranian magnetosphere may harbor an ocean world like those known or believed to exist at the other Giant Planets.

Cohen, Turner, Kollmann, Clark, Hill, Regoli, et al. (2023) *Geophys. Res. Lett.*

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