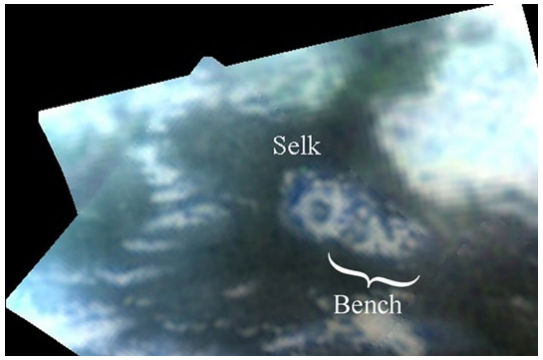
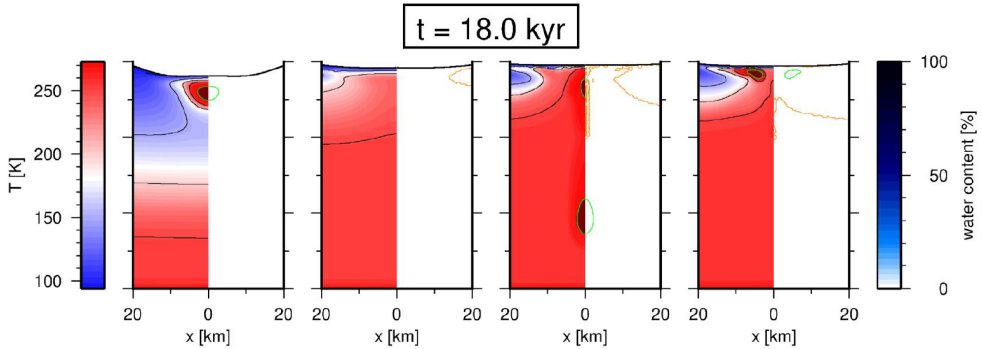
Evolution of impact melt pools on Titan

- Selk crater, Titan, is the target of the Dragonfly mission to be launched in 2028
- The fate of melt pools (water) formed during Selk-like impacts is modeled
- Although water is denser than ice, the likelihood of the water to remain in the subsurface is very high. It would remain liquid during a few thousands of years
- These pools would contain organics produced in Titan's atmosphere. The chemistry of the organics trapped in the pool could evolve during that time. How organic evolution may have ascended up (or down) the ladder of life will be explored by the Dragonfly mission.

Composite mosaic of the area around Selk crater, Titan. It will be explored by the Dragonfly mission to be launched in 2028.



This mosaic was assembled from a series of observations by the Visual and Infrared Mapping Spectrometer onboard the Cassini mission. Credit Es'Sayeh et al. (2023)



Two-phase flow simulations show that the sinking of subsurface melt formed by impacts (here a 4 km diameter impactor) is limited and may not reach the deep ocean. The thickness of the clathrate layer is equal to 0, 5, 10, 15 km, from left to right. For each case, the panels show temperature field (left) and the water fraction (right) after 18,000 years.

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