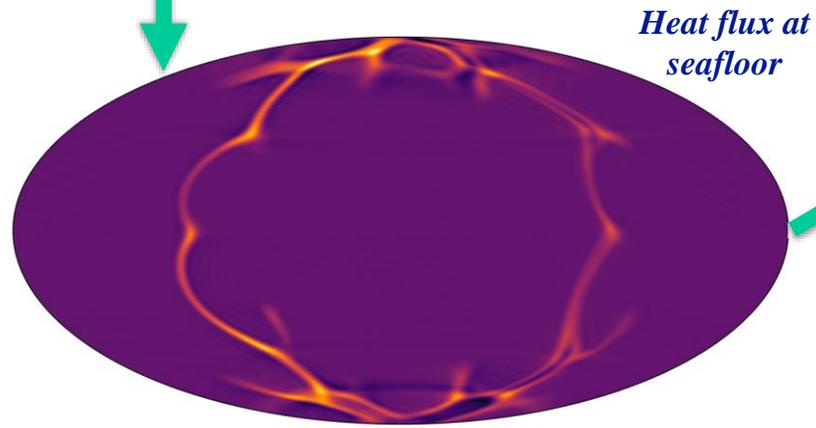
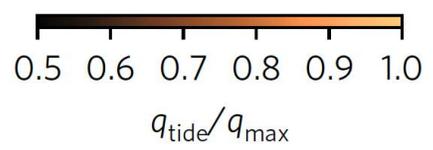
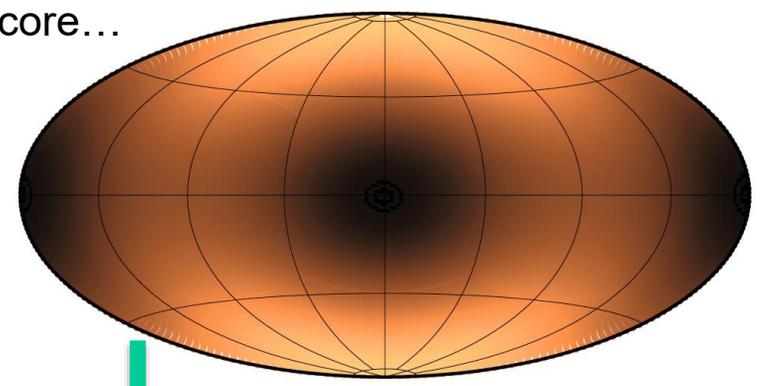


A complete picture of the heat transfer inside Enceladus

Tidal heating in Enceladus' porous core...

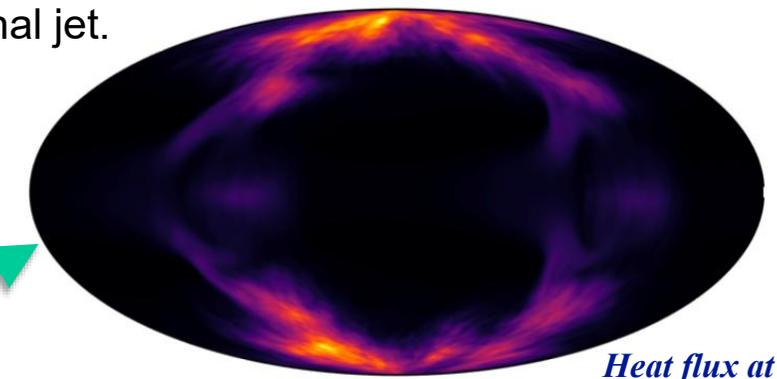


Heat flux at seafloor

**Bouffard, M., Choblet, G., Amit, H., Tobie, G., Čadek, O., & Terra-Nova, F. (2025). Seafloor hydrothermal control over ocean dynamics in Enceladus. Nature Astronomy, 1-8.**

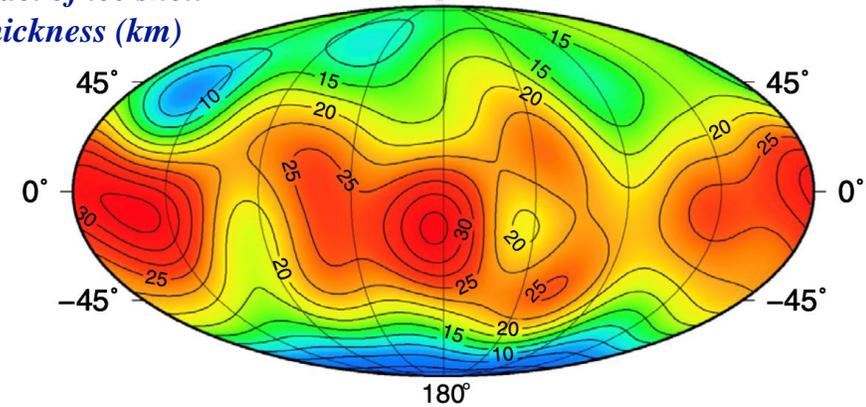
**Ocean dynamics = the missing piece of the Enceladus puzzle**  
 => studied with 21 numerical simulations

At the ocean-ice interface, the ocean dynamics projects the seafloor heat flux map at high latitudes, but homogenises it at low latitudes due to a powerful oceanic zonal jet.



Heat flux at the ocean-ice interface

Model of ice shell thickness (km)



... generates a very heterogeneous heat flux at the bottom of Enceladus' ocean (Choblet al., 2017).

This explains both observations-derived variations of Enceladus' ice shell's thickness (Čadek et al., 2019) and the transport time of hydrothermal particles across the ocean.