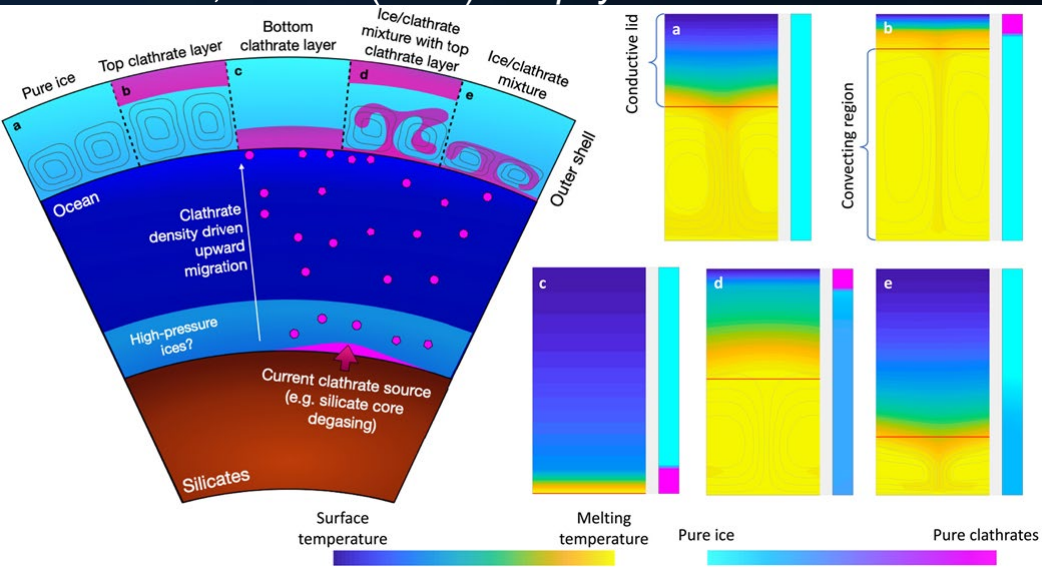


Dynamics of Clathrates in Ocean Worlds

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Icy ocean worlds are promising targets for the discovery of extraterrestrial life in our solar system as they have an outer shell that is predominantly composed of ice that insulates internal oceans where life may exist.

- A recent study explored the dynamics involved in determining the location of clathrates, or gases trapped in the water ice, within these ice shells.
- Researchers used computer models and physical data for ices and clathrates based on constraints from the Cassini

and New Horizon missions to further improve our understanding of clathrate dynamics.

- This study shows clathrates accumulating at the base of the ice shell are entrained throughout the shell which slows convection and thickens the conductive lid across a range of ocean worlds (see figure).
- The pronounced effect of clathrates on heat transport has the potential to preserve sub-ice ocean habitats, while simultaneously limiting avenues for habitability promoting material transport through the ice shell.