Oceans in Icy Planetary Bodies

Meeting schedule

10:00-10:30 Coffee

Morning session (Chair A.D. Fortes)

10:30-10:35 Dominic Fortes (UCL). Introduction.

10:35-11:00 Nicole Rappaport (JPL). *Use of tidally perturbed gravitational potentials to detect subsurface oceans in icy satellites.*

11:00-11:25 Michele Dougherty (Imperial College). *Future orbital missions to the icy satellites of Jupiter.*

11:25-11:50 Tim Leighton (Southampton). Exploration of the oceans of icy planetary bodies: the opportunities and challenges in the use of acoustics.

11:50-12:15 Rob Gowen (MSSL). Instrumentation to explore sub-surface planetary oceans.

12:15-12:40 John Loveday (Edinburgh). High pressure diffraction and planetary science.

12:40-13:00 Miles Osmaston. What can Triton's retrograde orbit tell us about how the Giant Planet interiors were constructed and acquired their gas/ice envelopes?

13:00-14:00 Lunch (*not provided*)

Afternoon session (Chair G.H. Jones)

14:00-14:30 Javier Ruiz (Universidad Complutense de Madrid). Heat flow and thermal state of the outer shell of icy satellites

14:30-15:00 Gillian Sclater (Birkbeck). Modelling of outgassing from liquids inside icy satellites.

15:00-15:30 Leila Battison (Oxford). Oceans in icy bodies - our best chance at finding extraterrestrial life?

Surface heat flow and thermal state of the crust of the icy Galilean satellites

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The use of temperature-in-depth indicators (as for example the effective elastic thickness of the lithosphere or the depth to the brittle-ductile transition) can give clues on the surface heat flow and the thermal state of the outer shell of the icy satellites, which in turn has profound implications on the evolution, and the possibility of existence of internal oceans, in these planetary bodies. This kind of approximations has found very high (and possibly recent) surface heat flows for Europa, and ancient high heat flows for Ganymede. On the other hand, the heavily cratered of Callisto suggests a cold and inactive outer ice shell throughout the entire history of this body. However, irrespective of the greatly different geology recorded on the surface of the icy Galilean satellites, there are evidences from orbital magnetic observations for salty oceans inside all them. By combining heat flow estimations and the existence of internal ocean, a more complete description of the thermal history of the icy Galilean satellites should emerge.