

Optimists look for life on icy surface of Europa

THE giant planet Jupiter and its retinue of satellites are an unceasing source of wonder.

Early risers will see it as the brightest object high in the pre-dawn sky (except, of course, when the Moon is present).

Sometimes, when gazing up at Jupiter, it is hard to realise that it is being circled by one of the marvels of modern science, the Galileo spacecraft.

Bridging hundreds of millions of kilometres of inhospitable space, Galileo's nuclear-powered transmitter is sending us a steady stream of pictures of worlds other than our own, together with priceless scientific data.

Until recently the focus of Galileo's attention has been the mysterious jovian satellite Europa, on account of fairly direct evidence for extensive oceans hiding beneath its ice-layered surface.

It is speculated that the seas of Europa might be the likeliest abode for life elsewhere in our solar system.

Hopes have been dashed somewhat by careful calculations suggesting that the energy available there, so far from the Sun, might not be enough to sustain life.

The optimists are unconvinced by such negative arguments and maintain that nobody can be sure until a landing is made on the icy surface of Europa.

They concede that fish may not be



Colin
Keay

Astronomy

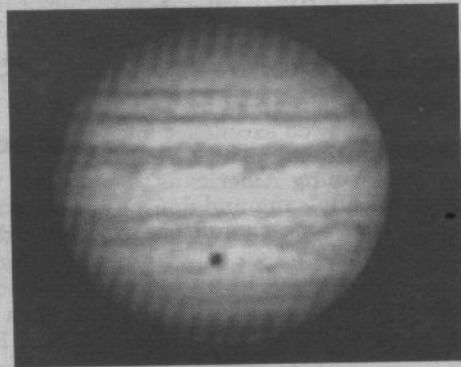
present under the ice, but point to a class of microbes called archeobacteria that have been found to survive in ice more than 40,000 years old and in Siberian permafrost for over 5 million years.

More recently, Galileo popped up with another surprise, finding evidence for a salty ocean under the jovian satellite Callisto's forbidding exterior of rock and ice.

The evidence hinges on measurements showing that Callisto's magnetic field varies in time with Jupiter's rotation, and this calls for an electrical conducting medium within Callisto. A salty ocean seems the best explanation.

Talking of oceans, those of our own planet hold many secrets.

Just lately, in drill cores from the bed of the South Pacific, a rare radioactive isotope of iron has been found. It has a half-life of little more than a million years so could not possibly have existed



Satellites: Jupiter, source of wonder.

there since the birth of our planet.

It can only have arrived from space.

This particular isotope of iron is produced quite prolifically in supernova explosions. It seems likely that a cloud of supernova debris rained down on our planet a few million years ago, leaving its signature in the layer of ocean sediment where it was found.

The amount of star-material found in the sediment layer suggests that the supernova exploded reasonably near our solar system. If so, other conforming evidence is likely to turn up.

Who knows, it may even have been a trigger for the emergence of our species!