

Moons

The JUICE mission to Jupiter

JOHN ZARNECKI:

My interest and speciality is building instruments that go into space, specifically to measure the physical properties of interesting places. So that means, generally, the surfaces of planets or satellites and their atmospheres, and to measure the physical, rather than the chemical properties. If we look at some of the instruments that flew 30 years ago, for example, to us now, I would describe them as clunky. They're rather big, they would seem cumbersome. I mean, they did wonderful measurements. But we can make them generally more compact, which means we can fly more instruments. They have more sensitivity and I guess they're more reliable. So it's really a matter of continual refinement and improvement, miniaturisation, sophistication.

In the world of icy moons research, the next big thing is a mission called JUICE, which stands for Jupiter Icy Moons Explorer. It's just been selected by the European Space Agency. It will be launched in 2022. It will arrive at Jupiter in 2030, put that year in your diaries. And this is really exciting, it's going to target in particular, Europa, Callisto, and especially Ganymede, which is the largest moon in our Solar System. And this mission will do a series of manoeuvres in the Jovian system, but it will culminate in orbiting around Ganymede for several months. And the final orbit will take you just 200 km above the surface. Now we believe that Ganymede, perhaps like several of the icy moons, possesses a subsurface watery ocean. With very sophisticated instruments, including ice-penetrating radar, we hope to be able to confirm the existence of these large bodies of water below the surface.

Well of course one of the great interests in finding water is the tantalising possibility that these might be habitats for life. We're not talking perhaps about very developed life, we're talking about primitive, simple life. But still, if that were to be confirmed, or at least initially, we would just be confirming the existence of these environments. But they're potentially environments which could harbour life, and that would be fascinating.