

## Europe should invest more in space science

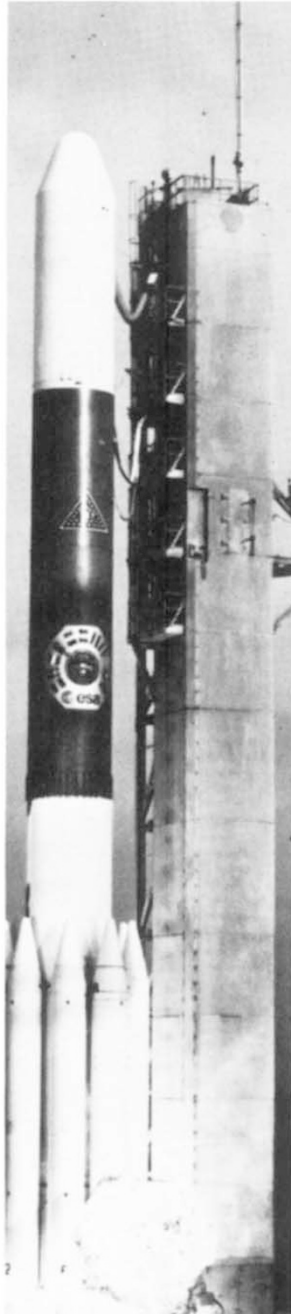
SPACE science is expensive. NASA's science budget amounts to half-a-billion dollars a year. No individual European country could afford a national programme to satisfy the needs of its astrophysicists and geophysicists to do experiments in space, let alone provide opportunities for scientists working in other fields to realise the potential space has to offer. For Europeans, therefore, international collaboration is essential. It pools funds, expertise and ideas.

The European Space Agency (ESA) undertakes this task. If ESA did not exist, space scientists in individual European countries would have to rely on *ad hoc* international collaborations. More likely than not, most of these would involve NASA, which has a world lead in space science and can build spacecraft more cheaply and efficiently than any European country. Such collaborations could undoubtedly benefit all taking part: previous ones have proved this.

But total reliance on NASA could be dangerous. For example, some European scientists might want to build a mission which is of no interest to NASA at the time it is proposed. This might not be because it is unworthy of development but simply because it is not NASA's policy to build that type of mission at that time. European scientists need some independence and ESA should be able to provide it.

This is not to say that ESA itself should shun collaboration with NASA. On the contrary, wherever such collaboration is the best way of achieving the scientific aims of a particular project, it should be done. And this applies just as much to collaboration between individual countries and NASA.

If ESA is to provide European scientists with a certain amount of independence, it must provide them with enough launches. Many European scientists feel that, because of its appallingly low budget for science—about a tenth that of NASA—and poor value for money, ESA is failing them. And matters are unlikely to improve. The few funds which are available might well be spread even more thinly in future.



ESA is now under pressure to support missions to the planets. And it will soon have to decide how to pay for materials and sources, such as climatology.

Although it cannot support some of these scientific disciplines at the expense of the others, ESA must make sure that it does not lose the support of its best scientists. There is a danger that when a group of space scientists in Europe develops a world lead in its discipline, it will want to break away from ESA because ESA cannot give it the opportunities it needs to maintain that lead.

The key to ESA's future success is more space opportunities more often. This could be achieved if member states agreed to increase the mandatory science budget. Matters could be improved even further if ESA could cut costs.

ESA's Science Advisory Committee is arguing that some of the surplus money which will be available in the early 1980s—when the applications programmes start to cost less (see page 356)—should be diverted to science. But space science is not high on the list of priorities in most member states, who want an immediate financial return for their investments.

Good science, as always, has its intrinsic merit, but there are extrinsic reasons for a substantial investment in space science. In many industries, a strong programme of scientific research stimulates the development of new technologies. This applies *a fortiori* to the space industry. Building spacecraft for scientific research often calls for greater technological advances than building applications satellites. For example, ESA's faint object camera for the Space Telescope has put Europe's industry in the forefront of advanced photon detector technology.

Further, if the development and running of space applications is taken over from ESA by industry, as seems possible, further investment in space science will be the one way in which national governments can keep their space industries on their toes. Space science should not be seen as a luxury, but as a necessary part of a healthy industry. □



**INSIDE: eight-page special on the European space science programme**