X-ray astronomy

Future looks rosy for UK

BRITISH X-ray astronomy, it seems, is basking in a ray of sunshine, whatever clouds may be gathering over the Science and Engineering Research Council (SERC, see *Nature* 4 May, p.5) that supports the subject. Exosat, the European Space Agency's X-ray observatory, is just beginning operation in orbit, while almost simultaneously it appears that SERC has agreed to commit a sum "substantially less than £10 million" to yet another X-ray satellite, the German-led trilateral Rosat. The third partner to the DM300 million (£75 million) satellite will be the United States. Rosat is due for launch on space shuttle number 60 in July 1987.

Dr Joachim Trümper, director of the Max Planck Institute for Extraterrestrial Physics in Garching that designed and is building Rosat, says Rosat is two to three times cheaper than had it been built and launched by ESA and is tremendous value.

Within six months of launch, it will have surveyed the X-ray sky at 1,000 times the sensitivity of the previous whole-sky map (by UHURU) and will then "with luck" perform one to two years of observations on selected objects. Rosat will increase the number of known X-ray sources by a factor of 50, Trümper believes, and will have five times greater sensitivity for quasars than even the biggest ground-based optical telescopes.

Meanwhile, Exosat remains the only X-ray observatory aloft. European Space Agency scientist Brian Taylor, holding the first, hour-old Exosat maps of X-ray source Cygnus X-1, said on Monday that Exosat "looks healthy and is working". One proportional counter on one of two identical telescopes had failed and would be switched off "for some considerable time" until the ground staff could determine what was wrong, but other instruments had shown cosmic radiation backgrounds an order of magnitude lower than had been feared, "extremely low and extremely steady", contradicting early Apollo estimates, said Taylor.

Exosat is three times smaller in focal length — and hence spatial resolution (colour) — than the Einstein observatory and has a smaller collecting area, but is better than Einstein in spectral resolution and in the observation of shorter wavelengths.

Exosat also has a remarkable orbit — out beyond the radiation belts (hence the fears about cosmic rays) to perigee at 191,000 km, compared with Einstein's circular 450-km orbit. This is an historical relic: Exosat was planned well before Einstein, when imaging X-ray telescopes were poor at best and observations were made by collimation. At that time astronomers envisaged locating X-ray sources by lunar occultation, for which an eccentric orbit gave a large apparent motion of the Moon, thus covering some 20 per cent of the sky

with possible occultations. In the event, occultation will hardly be necessary.

But the long orbit will still be useful: the satellite will be controllable in real time, remaining above the radiation belts for some 80 hours on each orbit, thus enabling rapid response to X-ray flares — and to the unexpected.

Robert Walgate

Lüst for ESA

Munich

PROFESSOR Reimar Lüst, president of the elite German research organization the Max-Planck-Gesellschaft (MPG) for the past 12 years, is to be the next director-general of the European Space Agency (ESA). He hopes to convince reluctant member states that ESA's mandatory science budget should be bigger.

Lüst conveys a diplomatic and gentlemanly manner, but this merely conceals the "dynamic" man beneath, his German colleagues say. Sir Hermann Bondi, who was director-general of the European Space Research Organization when Lüst was its scientific director (1962–64), thinks Lüst will be an outstanding director-general.

Lüst is a naval man: in 1943, at the age of 20, he was shot out of a U-boat in the Atlantic and picked up by a British ship. He learned his physics in an American prisoner-of-war camp. He likens ESA's membership to a convoy: it cannot move faster than the slowest ship and cannot turn faster than the biggest.

It is clear, he says, that "the scientific demand in Europe is much greater than ESA can provide". He hopes that governments will see this.

ESA research satellites are not unduly expensive, he believes — although leading space researchers within the MPG say they can be two or three times the cost of launches outside the agency. "I can't confirm the figure", says Lüst. After all, "the same industries build the satellites". But Lüst is "interested to look into this". As for the failures of Ariane, he argues these were just development problems. On communications satellites, where a commercial battle rages in Europe, ESA "must formulate a balance" between small and large states, he says. The objective of ESA is "the technological development of Europe . . . my main priority is to have a coherent programme in research and application".

One little problem he will face when he moves to Paris to take up his job in July next year is that he does not speak a word of French. "My scientific language is BE — broken English" he says. He believes that in science and technology "we should speak English, and not French and not German" — not an attitude that will go down too well in proud France. However, he promises to attend a few French lessons.

Robert Walgate

EEC research

Commission set to push ahead

Stuttgart

EUROPEAN Community government leaders at their summit meeting in Stuttgart again failed to discuss the philosophy behind Community Research Commissioner Etienne Davignon's plans to revitalize Europe's research efforts in the face of stiff competition from Japan and the United States. But the fact that the summit communiqué made only a passing reference to joint research and development activities is unlikely to keep Davignon from pushing ahead with his ambitious new industry-oriented research strategy.

The subject was covered in just one paragraph of the communiqué, which reiterated the government leaders "determination to develop and make more effective Community action in research, innovation and the new technologies with a view to facilitating cooperation between enterprises". There was also a suggestion that the Commission should come up with ideas for "improving the international competitiveness of enterprises". So at least some of Davignon's ideas found their way into the communiqué, and the Commission can now feel free to devise concrete proposals for encouraging the development of biotechnology and telecommunications at a European level.

The first fruits of the Commission's philosophy on research are to be seen in Esprit, the European Strategic Programme for Research and Development of Information Technologies (see *Nature* 9 June, p.461). Pilot phase contracts are now being signed between the European Commission and various European research units.

But for Davignon and the Commission, joint research is only the beginning. The long-term aim is much closer industrial cooperation in areas such as telecommunications where the costs of developing sophisticated new systems are becoming too great for individual countries to bear. What is needed, Davignon states, is "a gradual transfer of powers and means from member states to the European Community institutions".

Davignon knows, however, that it is too early to come up with operational ideas for the European Community to take over some of the roles of the national telecommunications administrations. Governments are increasingly unwilling to give up national powers. So Davignon has asked European Community leaders to appoint a panel of senior officials "who would be able to commit their governments" on the issue. The panel would discuss such matters as how strategic technological options could be decided at Community level, how European industry could cooperate on pre-competitive research and development and how a free choice of suppliers