criticality. This meant that the void coefficient was even more strongly positive and, as the power was well below the 20% level, so was the power coefficient.

In addition to the positive void and power coefficients, many of the safeguard systems had been deliberately disabled on the Chernobyl reactor just prior to the accident. When the turbogenerator experiment began, the main coolant pumps started to run down and the water in the core started to boil rapidly, increasing reactivity because of the positive void coefficient. Initially the automatic control rods were able to counteract this effect but soon they ceased to be effective and the reactivity and power began to increase. The positive power coefficient then caused the reactivity to rise until the reactor became prompt critical and the power increased at an extremely rapid rate, rising to about 100 times normal full power in only a few seconds (see Fig. 3).

Analyses carried out since the accident have indicated two factors which may have added to the severity of the power rise.

i) The RBMK absorber rods had graphite 'follower' rods suspended beneath them to increase their effectiveness. In normal operation, as the absorber rods are inserted into the core they replace the graphite rod. Without the graphite rod, the absorber rod would be replacing water (which is itself a good absorber) and it would not be so effective. At Chernobyl, the neutron flux was peaked at the top and the bottom of the core, due partly to the ^{135}Xe build up in the core centre. When the Chernobyl operators saw the initial power rise they pushed the manual reactor trip button, causing the absorbers to be inserted into the core. It has been suggested that as the graphite followers displaced water in the lower portion of the core where the neutron flux was high, they produced a local increase in reactivity.

ii) It has alternatively been suggested that a positive reactivity insertion in the lower part of the core could have been caused by cavitation in the main coolant pumps which resulted in the injection of vapour bubbles into the core.

Summary

The accident at Chernobyl has highlighted many issues concerned with the safety of nuclear reactors including that of reactivity coefficients. The above summarizes the reasons for their importance and indicates why the inherent stability of a power reactor depends on its specific design.

Astronomers in Europe

Dear Sir,

The front-page Editorial in the April 1987 issue of Europhys. News *(which I read only now owing to a two-year absence in the USA) contains a rather categorical statement (p. 46) to the effect that a broad consensus exists among European astronomers in favour of forming a European Astronomical Society (EAS), and that the only reason preventing this desirable development is that they (we) are too miserly to pay for it.*

In fact, most of us are members of the International Astronomical Union, which has a regular series of European Regional Meetings. Since 1969, we do have a common European journal, Astronomy and Astrophysics. *Those of us, including yours truly, who like to feel some kinship with the (other) physicists in our departments, can adhere to EPS and its Astronomy and Astrophysics Division at minimum rates if we are members of our national physical society or one of the astronomical societies that is a Collaborating Society. We are kept very well informed, also through this bulletin, of an already overwhelming multitude of interesting meetings. But, perhaps because the community is so much smaller, many subjects could simply not be adequately discussed in a purely European audience.*

I suggest that, rather than labelling astronomers wholesale as being even more avaricious, narrow-minded, and disloyal than their "real" physicist brethren who are dealt with in no uncertain terms in the following paragraphs of the Editorial, the EPS should explain to us why *forming an EAS would be worth our time and, yes, money. That approach might not be less successful.*

Sincerely yours,

Johannes Andersen

Copenhagen University Observatory, Denmark

The Chairman of the A & A Division Replies

This letter is a welcome reaction to the plans for a European Astronomical Society. The creation of such a society has been on the agenda of the Astronomy and Astrophysics Board of the EPS for some time — and it has proved to be a rather complex issue.

Dr. Andersen thinks that the financial aspects of such an endeavour have been stressed too much in the report on the Council meeting and complains that astronomers are unfairly depicted as having — to say the least — a very economical attitude in personal matters. This may be so.

The primary reason, why astronomers have not joined EPS in great numbers is probably rather that they do not quite identify with physicists. Most of them belong to national astronomical societies and some also belong to the American Astronomical Society. More established astronomers can seek approval of their National Academies to become members of the International Astronomical Union (IAU).

Given the current state and outlook of astronomy in Europe and given the traditional links between European astronomers — in the East and the West — the Astronomy and Astrophysics Board of the EPS has recommended that an independent, representative organisation for European astronomers (with individual members) be founded. The Board regards this as a cultural need. Such a society can provide many services, as, for example organise discussion meetings and workshops with a substantial attendance of young astronomers. Its annual meetings could probably be held within the current framework of the European Regional Astronomy Meetings of the IAU (which are co-sponsored by the EPS through its A & A Division), since one should try not to create any more large general conferences. The continuity provided by a dedicated European Astronomical Society will in turn assure a more uniform, high standard for the Regional Astronomy Meetings.

If such a society is run on an honorary basis exclusively, the membership fee can be kept very low. Collaboration can be sought with those national astronomical societies that deem this desirable as well as with the EPS. Astronomers could then also become Individual Ordinary Members of the EPS at minimum rates. Given this scenario, one might wonder why a European Astronomical Society is not yet in existence.

Martin C.E. Huber

(Chairman, EPS Astronomy & Astrophysics Division)

The strictures on parsimony and parasiting were not aimed specifically, or even mainly, at the astrophysicists. The juxtaposition of the two paragraphs was unfortunate and for this we apologise. *Ed.*