The two-metre reflector at Rozhan.

**ASTRONOMY is one of the few areas where Bulgaria can offer world-class facilities. The Institute of Astronomy's telescopes are at Rozhan, a four-hour drive from Sofia that leads across the central lowlands to the ancient city of Plovdiv (the site of the second largest university) and then up a winding road into the Rhodope mountains. The observatory, at 1,800 metres, looks across several ranges of mountains to the Greek border.**

**At Rozhan are a 2-metre reflecting telescope, and associated spectroscopes, a 70-cm diameter Schmidt telescope for larger-scale sky surveys, and a 60-cm diameter telescope for photometry. The observatory represents the "beginnings of modern astronomy in Bulgaria", according to Kiril Panov, a senior member of the observatory staff who works on flare stars. Until the observatory was completed in 1981, Bulgarian astronomers either stuck to theory or went abroad for observational work.**

**Around 40 researchers from the institute, plus another 15 from the University of Sofia, use the observatory. Much of the work is on variable stars; besides Panov's research on flare stars, there are groups studying rotating and pulsating stars.**

**Several collaborative projects are under way with the Soviet Union and other countries. With the political scene changing, Panov would like to see new collaborative projects emerge; he says that the observatory is ready to offer a warm welcome to astronomers from the West.** A.A

2,500 clinical and research staff, the old system of fixing budgets for the institutes has been used until now. With such central control, one researcher explains, money goes to the person who speaks up — planning becomes more important than realization. The result has been that it is what you promise, rather than what you deliver, that determines what you get.

In the future, Assen Jhablenski, the president of the Academy, intends to switch to a much more competitive system of peer-reviewed grants, 2–4-year contracts of employment rather than automatic tenure, and a system of rewards for those who gain external contracts for their institutes. The Academy of Science already puts half its research funds into a competitive grant system that is refereed by panels of experts. But the system does not work well for the simple reason that there is too little money to be given out.

Another source of competive funding is the Ministry of Science and Higher Education. Despite its grand title, the Ministry is considerably poorer than the Academies. It is a new creation, having recently been upgraded from a 'Committee' of the same name, whose representatives were elected by the entire Bulgarian scientific community. Its officials are now appointed and it combines the function of a National Science Foundation, with funds of around 60 million leva ($25 million) available this year to researchers in the universities, Academies or industry. The Ministry exists in parallel with the Academies, rather than above them, but in the future might end up swallowing the research grants of the Academies so that there would be just one central grant-giving body.

This is not a change the Academies are likely to back. Alexander Assenov, the deputy minister at the Ministry of Science and Higher Education, says that the "whole bureaucratic machine is against a central grant agency, including the directors of institutes". Assenov says, "Scientists want money and opportunities to travel and to invite their colleagues to visit them; a central fund guarantees the independence of scientists from their administrators".

With an election in the offing it is still anybody's guess what changes in the organization of science might occur. But the betting is that the Academies are so well entrenched that they cannot be broken up, nor can their power be much diminished. It is even possible that the new Ministry might find itself a committee again later in the year.

## University autonomy

The University of Sofia's vice-rector Panayot Bontchev has just returned from a tour around universities in the United States, seeing how they manage their finances and their relations with new industries — surely a sign of changing times in Bulgaria. The university is the biggest and best in the country, with some 20,000 students. Its headquarters are in a classic if somewhat gloomy building just across the street from the Parliament building.

Greater autonomy has already come to the university since liberalization began on 10 November. Thanks to a new law, Parliament will now decide the university's budget directly, and the university will be responsible for its own decisions on examinations, student numbers, the distribution of money to faculties and so on. In the past, says Bontchev, "we could only make proposals, even everyday problems had to be decided by a central bureaucracy elsewhere". The university is already busy changing its social science and philosophy curriculum — so far restricted to a Marxist approach — as a market economy appears on the horizon.

Bontchev hopes for better cooperation between the Academies and the universities. In the past, attempts at integration have failed, mainly because integration "meant decreased funds for the research at the university and an empty promise that they had access to Academy research facilities". This time, says Bontchev, instead of trying to order integration from the top, the emphasis will be on supporting research projects organized jointly by the Academy and the universities.

Hopes for increased research funds at the universities are, however, pinned on technology transfer from the universities to new small companies, some to be set up by university faculty, as is common in the United States. Bontchev says there are "lots of good ideas and techniques" at the university that could be exploited. Finding sufficient capital may prove to be the real difficulty, and the Achilles heel of both the universities' and Academies' schemes for an income from industry.

## Ecological secrets

Information about the sad state of the environment is only just beginning to be made public. There are many local problems of air and water pollution, including high levels of lead around plants at Plovidiv, and a global problem in the Black Sea where pollution is serious but mostly comes from other countries.

The Academy's response has been the creation of a new Institute of Ecology with a mandate to coordinate ecological research throughout Bulgaria and to try to influence regional development and environmental policy. The biggest problem at the moment is "underestimation of the problems", says Radi Radev of the institute; "there has been no awareness of the environmental consequences of development". **Alun Anderson**

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