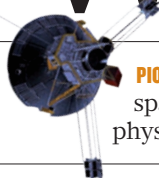


# THIS WEEK



## EDITORIALS

**WORLD VIEW** Science in the Arab world needs more than revolution **p.7**

**PIONEER** Far-flung spacecraft obey laws of physics after all **p.9**

**HIT THE NORTH** Denmark maps out industrial future for high Arctic **p.10**

## The permanent revolution

*To rediscover its glorious scientific past and build a knowledge-driven economy, Russia must break old habits and loosen state control on research.*

Russian science is recovering. After almost two decades of dire financial drought — and despite the casual disdain for all things intellectual shown by the profit-crazed oligarchy who have become Russia's elite — research is reclaiming its place as one of the country's most noble institutions.

Much of the credit for this improved situation must go to Andrei Fursenko, the science and education minister in the government of Prime Minister Vladimir Putin. Fursenko, a physicist trained at the prestigious Ioffe Institute in St Petersburg, understands how modern science works, and knows where and why the Russian research system is in disorder. Not everything he does pleases the Russian academic establishment. But this in itself can be considered an endorsement of Fursenko's approach, given the establishment's inclination to recycle the past rather than turn to modern conventions such as international peer review and scientific competition.

Among the most visible signs of the improved health of science in Russia, and of Fursenko's guiding hand, are the government programmes set up to establish cutting-edge research at Russia's long-neglected universities. These focus in particular on efforts to get experienced Western scientists to do research at Russian university labs through the 'mega-grant' programme, launched last year.

Russia being Russia, Fursenko's efforts have tended to get bogged down by the state's bureaucratic superstructure, to which science and the freedom to pursue it mean very little. As we report on page 17, the most recent example of this is the stalling of a prominent German–Russian mega-grant project to study carbon flux in the environment, which came to a halt on the command of Russia's security services. In this case, Fursenko seems to have won the battle — the project will go ahead, but institutional barriers to collaborative projects remain. Western scientists and companies are learning the hard way that over-regulation in Russia is a different beast to the red tape they encounter at home.

The purchase, import and export of equipment and samples require federal security approval that can be grindingly difficult to obtain. Federal security services need not justify nor explain their rulings. There is no formal way to appeal even obviously offhand decisions, and it is downright impossible for grant holders to communicate with local or federal officers in charge. At lower administrative levels, bribery is yet to be properly addressed, and officials' insistence that every piece of research equipment is purchased through designated Russian agencies (usually at inflated prices) borders on institutional corruption.

Faced with this situation, foreign scientists given mega-grant projects could be forgiven if they elected to do research and spend grant money in their home countries, rather than at the Russian host institutes. This undermines one of the programme's main aims — to bring Russian students and young scientists into contact with high-profile international science early on in their careers — and threatens to diminish its effect on the modernization of Russian science.

Fursenko cannot change the system alone, but must continue to do

what he can. All scientists who are participating in the current round of the mega-grant programme, for example, will need clear instructions on deadlines and approval procedures for their projects. And there must be guidance on which formal responsibilities lie with the grant holder, and which ones lie with the host institute.

If Russia is serious in its ambition to develop a knowledge-driven economy, it must substantially reduce the level of state control on research and development. It has given science a helping hand, but — as Fursenko seems to know and as Putin must also understand — further progress needs freedom. ■

## Reality check

*Who'd be a scientist? As funding levels fall and competition rises, no one seeking leisure.*

The contrast could not be greater. Julie Overbaugh, a lab head at the Fred Hutchinson Cancer Research Center in Seattle, Washington, who researches the molecular virology of HIV, advocates the need for labs that allow their researchers a fulfilling life outside the lab (page 27). Conversely, Alfredo Quiñones-Hinojosa, a stem-cell neurologist and surgeon who heads the brain-tumour programme at Johns Hopkins University in Baltimore, Maryland, drives himself and his lab members as close to a 24/7 working life as is humanly possible (page 20). What might a young scientist make of these two styles, apart from the observation that it takes all sorts?

The necessity for hard work in science has long been emphasized. In his classic *Advice to a Young Scientist*, published in 1979, Peter Medawar emphasized the competitiveness of science and the inevitable concerns about priority. He also issued a golden rule: if you want to make important discoveries, choose an important problem. However, such problems add up to a recipe for perpetual hard work: important problems not only attract the most ambitious scientists but also present risks and false steps in the innovative approaches required to address them.

Overbaugh is right to highlight a need for time away from the bench or computer for creative reflection. Lab heads also need to ensure that their younger lab members maintain a sense of autonomy rather than of cog-in-the-machine. And young scientists applying for posts must understand what sort of lab head they are dealing with. But many older folk wistfully recall their early postdoc careers, when they had one or two clear challenges to focus on late into the night, and over weekends too. As research funding declines in many countries, science will intensify. Anyone lacking the inner intellectual drive and a capacity for relentless focus to get to the heart of the way the world works should stay away. ■