NEWS

Ukraine scientists grow impatient for change

Ukraine's 'orange revolution' — a national protest against corruption that overthrew the first results of the country's 2004 election — raised hopes for political and societal change. But more than a year on, scientists are increasingly frustrated by the slow pace of reform of the country's Soviet-style research system, which they believe is being hampered by Ukraine's aged and anti-European scientific establishment.

The nation, which has a population of 48 million and is Europe's second-largest country in terms of area, has a long tradition in science and hosts an extensive network of academic institutes and research facilities. But, as it did elsewhere in Eastern Europe, science declined dramatically after the collapse of communism in 1991, forcing thousands of researchers to leave the country.

"Nothing will change in Ukrainian science as long as the current system exists."

When Viktor Yushchenko came into power in January 2005, it was hoped that the pro-West president would encourage a fundamental reform of the science system. But critics say that the promised switch to less a authoritarian system has hardly begun.

The focal point of criticism is the National Academy of Sciences of Ukraine (NASU), which runs 174 institutes and employs around 28,000 researchers. The powerful academy, a relic of the Soviet science complex, dominates Ukrainian science. The average age of the academicians is about 71; the president, Boris Paton, an expert in electric welding and the son of the former president, is 85.

The bulk of the academy's activities relate to mechanics, material sciences and physics — euphemisms, according to critics, for former military-oriented engineering institutes. And productivity is low. According to the Thomson Scientific (ISI) statistics, academy scientists publish around 1,500 papers a year — roughly one-third of the output of Britain's University of Manchester alone.

But critics say the academy is not interested in carrying out an independent review of its scientific performance. There are also claims of widespread corruption. For example, an attempt to create closer ties between Ukraine and western European institutions by linking Ukraine to GÉANT, the high-speed European data communication network, was allegedly hindered by academy members demanding bribes. Another complaint is that the academy leaders, fearing competition and loss of influence, are blocking attempts to facilitate Ukraine's participation in research programmes funded by the European Union (EU), by deliberately holding back information and generally failing to cooperate with EU authorities.

"The Academy is not interested in any reform whatsoever," says Aleksei Boyarski, a theoretical physicist at CERN, the European lab for particle physics in Geneva, Switzerland.

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

Russian premier Vladimir Putin (left) salutes academy president Boris Paton, aged 85.

E.LUKATSKY/AFP/GETTY IMAGES

Evidence for bubble fusion called into question

ONLINE SPECIAL REPORT

Fresh questions surround the claims that bubble fusion has been achieved, according to an investigation by *Nature*.

Reports by Rusi Taleyarkhan that he had achieved table-top fusion in collapsing bubbles caused a storm when they were published in 2002 (R. P. Taleyarkhan *et al. Science* 295, 1868–1873; 2002).

Taleyarkhan, a nuclear engineer now based at Purdue University in West Lafayette, Indiana, used sound waves to cause the formation and collapse of bubbles within a liquid. The conditions inside the collapsing bubbles are theoretically extreme enough to allow nuclear fusion to take place. Taleyarkhan claims to have achieved this — an effect that, if real, could one day provide an almost limitless source of energy.

Four years later, Taleyarkhan's work retains an almost magical ability to grab the headlines, most recently in January, when his latest results (R. P. Taleyarkhan *et al. Phys. Rev. Lett.* 96, 034301; 2006) were promoted in a press release by the American Physical Society. Millions of dollars are being spent trying to repeat the work, including $800,000 from the US Department of Defense.

But corroboration remains elusive. Now, an investigation into the circumstances surrounding Taleyarkhan's experiments is throwing up serious questions about the validity of the work.

Interviews with researchers who have worked closely with Taleyarkhan at Purdue reveal concerns about his actions since he arrived there full-time in 2004. The steps he has taken, they say, include claiming he obtained positive results from equipment on which they had seen only negative data, and removing the equipment from their lab altogether.

And physicist Brian Naranjo of the University of California, Los Angeles, has completed an analysis that he plans to post later this week on arXiv. It suggests that the spectrum reported in Taleyarkhan's latest paper as proof of nuclear fusion came instead from the radioactive decay of a standard lab material.

Taleyarkhan has declined to comment on events at Purdue, or on Naranjo's analysis, and he vigorously affirms that his results are valid and the effect is real. But the overall message from people close to this work is that there is little hope this particular approach will yield a viable fusion energy source. ■

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For the full investigation please see ▸ www.nature.com/news/bubblefusion