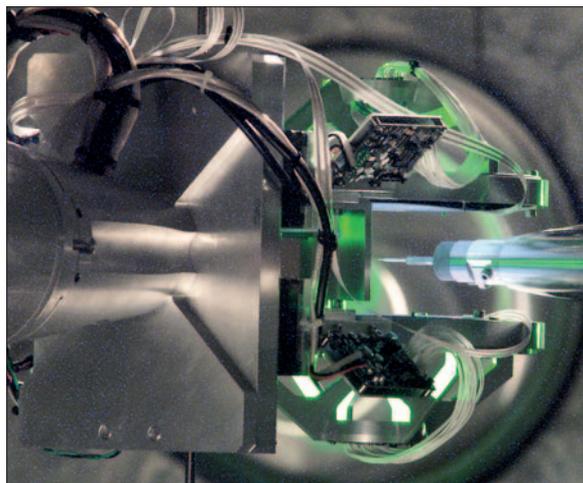


News & Analysis

'Closed city' to house laser-fusion lab

Russia has announced plans to build a 2.8 MJ laser-fusion device that will be the world's most powerful once completed within the next decade. Costing \$1.5bn, the facility will be located at the Russian Federal Nuclear Centre (RFNC) in the "closed city" of Sarov. Russian scientists claim that the device will be more powerful than both the \$3.5bn US National Ignition Facility (NIF), which has so far achieved energies of 1.8 MJ, and the Laser Mégajoule experiment currently being built near Bordeaux in France.

The fusion device, for which funding has already been approved by Russian prime minister Vladimir Putin, will be housed in a 360 m long, 10 storey building to be built at the RFNC's technology park in Sarov, near the city of Nizhny Novgorod. The home of Russia's nuclear-weapons design facility since 1946, Sarov was known throughout the Cold War as Arzamas-16 and was until 1995 removed from all unclassified maps. Even today, official permission is required to visit the city as it remains closed to foreigners and Russians who do not live there. However, Radiy Ilkayev, scientific director at the RFNC, has suggested that



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the new facility could be built just outside the closed area, so that it is accessible to other Russian and perhaps even international scientists.

The facility will be an inertial-confinement fusion device, in which a low-energy laser pulse is split into a number of "beamlets" that are then amplified into the megajoule range using a suite of amplifiers that have been optically pumped to high energies. The beamlets are then directed into a target chamber, where they heat and compress a small fuel "target", typically a mixture of deuterium

Focused approach

Russia will build a 2.8 MJ laser-fusion device at the Russian Federal Nuclear Centre that will generate fusion using a similar technique to that performed at the National Ignition Facility in the US (pictured).

and tritium. This causes the outer layer of the target to explode, which in turn compresses the core inwards. If sufficient energy is released, the compression at the centre of the target can be big enough to cause fusion to occur.

Inertial-confinement fusion, such as that carried out at NIF, is also used extensively in nuclear-weapons research and Ilkayev says that the new facility will be used for this purpose as well as for basic research. "On the one hand, there is the defence component, because the high-energy-density plasma physics necessary for developing thermonuclear weapons can be studied on such devices," says Ilkayev. "On the other hand, there is the energy component where laser nuclear fusion can create the energy of the future."

Sergey Kiriyyenko, head of Rosatom, the Russian nuclear-energy agency, thinks that the facility will yield significant scientific and economic benefits. "It offers huge potential for the development of fundamental science," he says. "And most importantly, it will secure the country's competitiveness in this field for the next 50–100 years."

Simon Perks

Research

Physicists warn of 'chilling effect' over US transparency bill

More than 80 scientific organizations, including the American Institute of Physics (AIP), have written to the US Congress opposing proposed legislation that is designed to increase the transparency of how government grants are awarded. The Grant Reform and New Transparency (GRANT) Act, passed by the House of Representatives' committee on oversight and government reform in November, would require all details of awards to be made public. The letter states that the act could have "unintended adverse effects" on science and engineering and "compromise the US innovation system". Opponents are unhappy because the bill would force researchers to reveal details of their



Lawrence Jackson

Weighty issues

Fearing it will compromise US innovation, scientific organizations are campaigning against the Grant Reform and New Transparency Act.

grant proposals, which may include work that has not been published, as well as give full details of who reviewed the grants.

"The main thing we are worried about is the intellectual property of the grant writers," says Samuel Rankin, associate executive director of the American Mathematical Society and chair of the Coalition for National Science Funding, which drafted the letter that was sent to every member of the House of Representatives in February. Rankin adds that removing the anonymity of peer reviewers "would keep a lot of people who should be reviewing proposals from doing it".

Frederick Dylla, executive director and chief executive of the AIP,

says that such requirements would have "a chilling effect" on the conduct of scientific research supported by the federal government. "The AIP is not alone in its apprehension that the disclosure of information contained in grant applications would negatively impact the competitiveness of the scientific process and would also have an adverse effect on patent applications," he says.

The letter, signed by 84 organizations, comes after the American Physical Society (APS) had made similar objections late last year in a letter to Darrell Issa, the California Republican who heads the oversight and government reform committee.

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