

## INFRASTRUCTURE

# Laser centre lights up eastern Europe

European Union investment in high-energy-physics facility raises spirits in Romanian science community.

BY ALISON ABBOTT

Known for its cumbersome bureaucracy, the European Commission rarely makes people smile. But this week it has managed to gratify both a scientifically struggling former-communist country, and the world's nuclear-physics community.

On 18 September, the commission agreed to spend €180 million (US\$237 million) on the first phase of construction for a futuristic nuclear-physics facility near Bucharest.

The Extreme Light Infrastructure Nuclear Physics Facility (ELI-NP) will generate laser pulses with up to 10 petawatts ( $10^{16}$  watts) of power, ten times the strength of current cutting-edge lasers — and intense enough to reveal the internal structures of atomic nuclei. “It will allow us to do a new sort of nuclear physics that hasn't been possible so far,” says project leader Nicolae-Victor Zamfir, director-general of the Horia Hulubei National Institute of Physics and Nuclear Engineering in Măgurele, Romania, where the facility will be located. “The energy of the laser-light pulses will be almost at the level of the strong force that binds nuclei, so it will be able to perturb them.”

Forty research institutions in 13 European Union (EU) member states have been involved in planning the facility, which is scheduled to start operating in 2017. The international academic community will be able to use the ELI-NP for free, but private companies will pay for access. Bids for access to the instruments will be assessed by international scientific committees.

The full construction cost for the facility will be €356.2 million, paid from Romania's allocation of structural funds — the EU subsidies designed to help poor regions to improve their infrastructure and economies. Structural funds have traditionally been used for civic projects such as road building, but the commission now encourages their use for projects that boost science.

The ELI-NP is one of three planned facilities in the Extreme Light Infrastructure, a broad effort to explore the frontiers of laser science that was identified as a top priority in 2006 by the European Strategy Forum on Research Infrastructure. All three will be built in eastern

Europe, reflecting the commission's desire to balance the distribution of research infrastructures around the continent. The European Commission last year approved about €236 million for the ELI's first pillar in Prague, which will generate bursts of laser light in the 10-picosecond ( $10^{-13}$ -second) range to accelerate beams of particles to high energies so that their interaction can be studied. The third facility, which is planned for Szeged, Hungary, will produce even shorter radiation pulses, in the attosecond ( $10^{-18}$ -second) range, enabling physicists to image the dynamics of electrons in atoms, molecules, plasmas and solids.

The approval of the ELI-NP is a welcome confidence boost for scientists in Romania, which has one of the EU's lowest national investments in research — just 0.5% of gross domestic product, compared with an EU average of 2%. On top of this, Romanian scientists have this year been shamed by a series of high-profile plagiarism scandals (see *Nature* **488**, 264–265; 2012) and dismayed by the current government's restructuring of its research advisory councils to exclude members from abroad.

The ELI-NP will be insulated from politics, says Dragos Ciuparu, a chemical engineer at the Petroleum-Gas University in Ploiești, Romania, who was secretary of state for research when the former government decided to commit the structural funds to the project two years ago. “So nothing can stop the facility from being built now,” he says.

Ciuparu adds that the ELI-NP will help to keep researchers and engineers in Romania, which has suffered a major brain drain. “But future governments will have to invest seriously in the national physics community here to best reap the facility's advantages,” he says. ■

**“Nothing can stop the facility from being built now.”**

## CORRECTION

In the News Feature ‘Dive master’ (*Nature* **489**, 194–196; 2012), the text for the ‘work basket’ in the graphic should have read: “Carrying capacity has been doubled”.