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EUROPEAN PLASMA RESEARCH ACCELERATOR WITH EXCELLENCE IN APPLICATIONS

ACCELERATOR INNOVATION FOR NEW HORIZONS IN SCIENCE

SMALLER SIZE AND IMPROVED COST-EFFICIENCY

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EuPRAXIA

DESIGNING THE FUTURE

The EuPRAXIA Consortium is preparing a conceptual design for the world's first multi-GeV plasma-based accelerator with industrial beam quality and dedicated user areas.

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ADVANCED TECHNOLOGIES

The project is structured into 14 working groups dealing with simulations of high gradient laser plasma accelerator structures, design and optimization of lasers and electron beams, research into alternative and hybrid techniques, Free Electron Lasers (FEL), high-energy physics, and radiation source applications.

EuPRAXIA joins novel acceleration schemes with modern lasers, the latest correction technologies and large-scale user areas. The consortium offers unique training opportunities for researchers in a multidisciplinary field.

Image of a plasma cell

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Particle accelerators have become powerful and widely used tools for industry, medicine and science. Today there are some 30,000 particle accelerators worldwide, all of them relying on well-established technologies.

The achievable energy of particles is often limited by practical boundaries on size and cost, for example, in hospitals and university laboratories, or available funding for very large scientific instruments at the energy frontier.

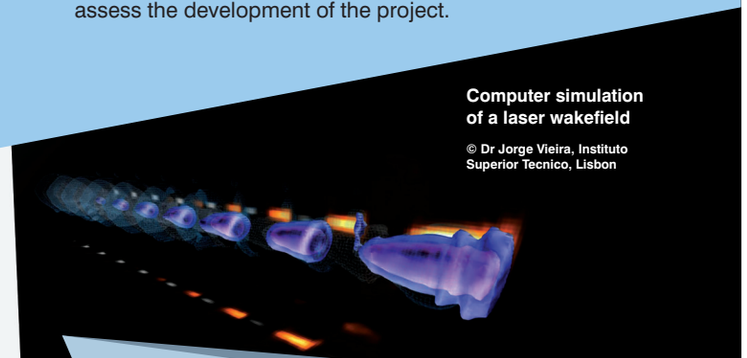
A new type of accelerator that uses plasma wakefields promises accelerating gradients as much as 1,000 times higher than conventional accelerators! This would allow much smaller machines for fundamental and applied research.

The goal of this project is to produce a conceptual design for the world's first multi-GeV plasma-based accelerator that can provide industrial beam quality into dedicated user areas.

INTERNATIONAL COLLABORATION

EuPRAXIA brings together a consortium of 16 laboratories and universities from 5 EU member states. The project, coordinated by DESY, is funded by the EU's Horizon 2020 programme. The consortium has been joined by 22 associated partners to make additional in-kind contributions.

The consortium holds open international events to strengthen collaborations, to connect to interested users from FEL's, high-energy physics, medicine and industry, and to assess the development of the project.



Computer simulation of a laser wakefield

© Dr Jorge Vieira, Instituto Superior Tecnico, Lisbon

OPENING NEW HORIZONS

The project will bridge the gap between successful proof-of-principle experiments and ground-breaking, ultra-compact accelerators.

With a smaller size and improved efficiency, plasma-based technologies have the potential to revolutionize the world of particle accelerators multiplying their applications to medicine, industry and fundamental science.

Participants in the EuPRAXIA Steering Committee Meeting. Paris, February 2016

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