



EUROPEAN PLASMA RESEARCH ACCELERATOR WITH EXCELLENCE IN APPLICATIONS

WP8: Outreach and Liaison

Dr Ricardo Torres

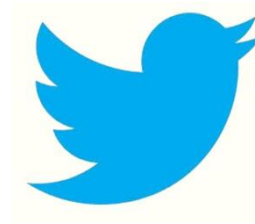




The screenshot shows the EuPRAXIA website homepage. At the top, there is a navigation bar with links for HOME, EUPRAXIA FOR BEGINNERS, EVENTS, CONTACT US, VACANCIES, and INTRANET. The main header features the EuPRAXIA logo and the text: "NOVEL FUNDAMENTAL RESEARCH COMPACT EUROPEAN PLASMA ACCELERATOR WITH SUPERIOR BEAM QUALITY". Below this is a "Find Out More" button. The main content area is divided into four columns, each with a title, a small image, a brief description, and a "LEARN MORE" button. The columns are: 1. OUR TECHNOLOGY: "EuPRAXIA brings together novel acceleration schemes, modern lasers, the latest correction technologies and large-scale user areas." 2. PARTICIPANTS: "A consortium of 16 laboratories and universities from 5 EU member states has formed to produce a conceptual design report." 3. WORK PACKAGES: "The project is structured into 14 work packages of which 8 are included into the EU design study." 4. MANAGEMENT: "The management bodies will organise, lead and control the project's activities and make sure that objectives are met."



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#EuPRAXIA #plasma #accelerator

www.eupraxia-project.eu

Accelerating NEWS

Compact modern accelerators for big science
By Carsten Wechs(UNILIV)

EuPRAXIA On 1 November 2015 a new European Design Study called EuPRAXIA ("European Plasma Research Accelerator with eXcellence In Applications") started. 3 MC of funding has been awarded to 16 laboratories and universities from 5 EU member states within the European Union's Horizon 2020 programme. They will be joined by 18 associated partners that make additional in-kind contributions.

The goal of this ambitious project is to design accelerator technology, laser systems and feedbacks for improving the quality of plasma-accelerated electron beams. Two user areas will be developed for a novel free-electron laser, for high-energy physics and for other applications. An implementation model will also be proposed, including a comparative study of possible sites in Europe, a cost estimate and a model for distributed construction but installation at one central site.

Latest issue

- First concept design for FCC-ee magnets
- Tests of 11T dipole at CERN
- FP7 CESSAMag and science diplomacy
- HTS-JI-based coatings for FCC beam screens
- EuCARD2 WP3 Workshop on the Energy Efficiency of Proton Beam Accelerators
- LINAC4 ready to go up in energy
- ICTR-PHE2016: Accelerators for health
- Accelerator Reliability and Availability Training
- HL-LHC corrector magnet tested at LAsA-ENEP

PHYS.ORG Nanotechnology Physics Earth Astronomy & Space Technology Chemistry Biology Other Sciences

Home > Physics > General Physics > April 26, 2016

EuPRAXIA to design world-first plasma accelerator research facility with strong industrial applications

April 26, 2016

Trapped electrons Laser driven beam Laser wakefield Plasma medium

Credit: The Cockcroft Institute, University of Liverpool

Accelerator scientists from across Europe are collaborating to design the world's first high

One way price including taxes, administrative and other non-optional charges and small cabin bag (max. 40x30x25cm). Large cabin bags and each piece of checked baggage are subject to additional fees. Number of seats at indicated prices are limited.

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Consortium sets out to build European laser plasma accelerator

Apr 27, 2016 @ 1 comment

Riding the wave: electrons being accelerated by a laser pulse

Accelerator physicists in five European countries are developing plans for the world's first high-energy laser plasma accelerator facility for use by science and industry. It built, the facility will deliver high-quality beams of electrons with energies up to 5 GeV. The EuPRAXIA consortium includes researchers at 16 institutes in the European Union (EU), including the DESY lab in Germany, the Italian National Institute for Nuclear Physics, the French national research

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TECHNOLOGY NEWS

World's first high energy plasma-based accelerator to be built

13 April 2016

Accelerator scientists from across Europe are collaborating on the world's first high energy plasma-based accelerator, which will be stronger and more compact than the current accelerators used by industry today. It is hoped that the new technology will open up opportunities to use the beams for entirely new types of applications.

The consortium that will develop the 5GeV plasma-based accelerator is made up of 16 institutions and 18 associated partners from more than eight countries, known

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THE EuPRAXIA FILES
ISSUE 1 – May 2016

Foreword

 Novel accelerators have seen strong advances not only in achievable beam energy but also in beam quality. This success story is still developing, as you can see from the publications that we collect in this first edition of "The EuPRAXIA Files". As many of you are aware, the Horizon2020 Design Study EuPRAXIA aims at a conceptual design for a European plasma accelerator with usable beams. Instead of another newsletter we will regularly provide you with summaries of recent publications, letting the science speak for itself. EuPRAXIA has meanwhile had an excellent project start and is gearing up to a workshop in Pisa at the end of June, organized together with the European Network for Novel Accelerators EuroNNA2 and EUCARID2. For further news on EuPRAXIA please visit our website or read regular updates in "Accelerating news". We wish you some inspirational science readings in this edition of "The EuPRAXIA Files", prepared by the EuPRAXIA outreach team in Liverpool with Ricardo Torres as lead editor.

Research Highlights

Berkeley Lab Scientists Create the First-ever, 2-stage Laser-plasma Accelerator Powered by Independent Laser Pulses

Researchers from the Lawrence Berkeley National Laboratory in the US have made an important breakthrough in the development of ultra-compact high-energy plasma-based accelerators.

In a paper recently published in *Nature*, they demonstrate for the first time the technique of staging, or sequencing multiple plasma accelerators independently powered. Staging is critical for high-energy physics applications of laser-plasma accelerators, as it enables to achieve higher beam energies, while maintaining accelerating gradients orders of magnitude above conventional technology.

In these experiments, electrons from one laser-plasma accelerator were transported into a second laser-plasma accelerator powered by a second laser pulse, and accelerated. What was particularly novel about this experiment is that a plasma-based lens was employed to transport the beam between stages and a plasma mirror was used to couple in the second laser pulse. These plasma-based components allowed the system to remain extremely compact.

With this result, one can envision scaling to beam energies of interest for high-energy physics applications in a compact footprint. However, these results are a first step toward that vision—experiments at higher beam energy, with higher efficiency and improved beam quality, will need to be performed to further develop plasma-based technology for next-generation colliders.


Read more at: <http://newscenter.lbl.gov/2016/02/01/2-stage-laser-plasma-accelerator/>


Members of the BELLA Center staging experiment team, from left are Eric Esarey, Will Esarey, James van Tilburg, Carlo Benedetti, Kelly Swanson, Anthony Gonzalez, Joost Daniels, Sven Strohriegl, and Kai Nakamura. Not pictured are Cameron Geddes, Carl Schroeder, Nicholas Martin, and Brian Shaw. (Photo credit: Roy Kaltschmitt/Berkeley Lab)

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THE EuPRAXIA FILES
ISSUE 2 – October 2016

Foreword

 The field of novel accelerators is highly productive, as one can see in the number and variety of publications that we point to in this second edition of The EuPRAXIA Files. It is particularly important that a number of studies start addressing the impact of imperfections on the beam quality. This is the theme of EuPRAXIA: generating high quality electron beams in a compact and highly cost-effective facility. It has been a very fruitful and busy year for EuPRAXIA with the Pisa workshop in June 2016 being one of several highlights. More than 120 scientists gathered at Pisa, the place where Galileo for the first time correctly described acceleration. He achieved this by building one of the first research infrastructures: an inclined plane for rolling balls of different weights. Writing this short text I am at the International Conference for Research Infrastructures (ICRI2016) in South Africa. The outreach to emerging and developing nations is a big topic here, to be achieved by open access to large facilities, their data and results. We should realize that the construction of compact and lower cost accelerators is a way to give more countries the opportunity to perform world-class research. EuPRAXIA can be an additional way to democratize science for the less wealthy parts of our world. Let's work towards this ambitious but very worthy goal. Please enjoy this second edition of The EuPRAXIA Files and let us know your view or opinion on novel accelerators.

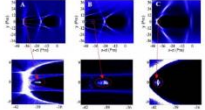
Research Highlights

Energy spread minimization in a cascaded laser wakefield accelerator via velocity bunching

Laser wakefields have the potential to accelerate electrons to near the speed of light in a much smaller distance than is required by conventional accelerators. However, the usually large energy spread of the beams generated in wakefield accelerators prevents the use of this technology for practical applications.

In a paper published in *Physics of Plasmas*, a team of researchers from China, South Korea and the U.S. has proposed a new method to minimize the energy spread of an electron beam in a cascaded laser wakefield accelerator.

The technique consists of inserting a plasma compressor between the injection and acceleration stages to reduce the longitudinal spatial distribution of the beam. The compressor also reverses the energy chirp of the beam so that the electrons can be accelerated to a much higher energy before its chirp is compensated.


Two-dimensional electron density distribution for the injector stage (A), compressor stage (B) and accelerator stage (C), where the target e-beam is circled by a dashed circle (in red). Jiansheng Liu/Chinese Academy of Sciences.

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- Collection of abstracts of recently published papers in laser-plasma acceleration
- Quarterly
- Distributed to all beneficiary and associate partners

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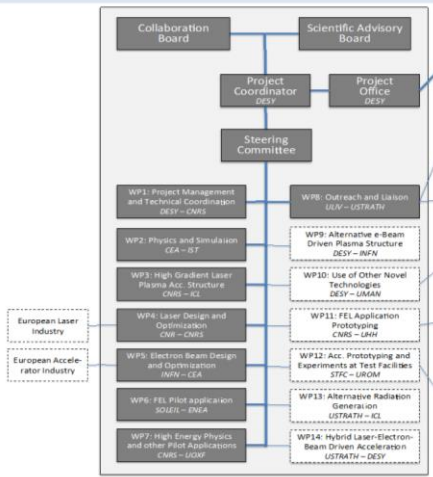


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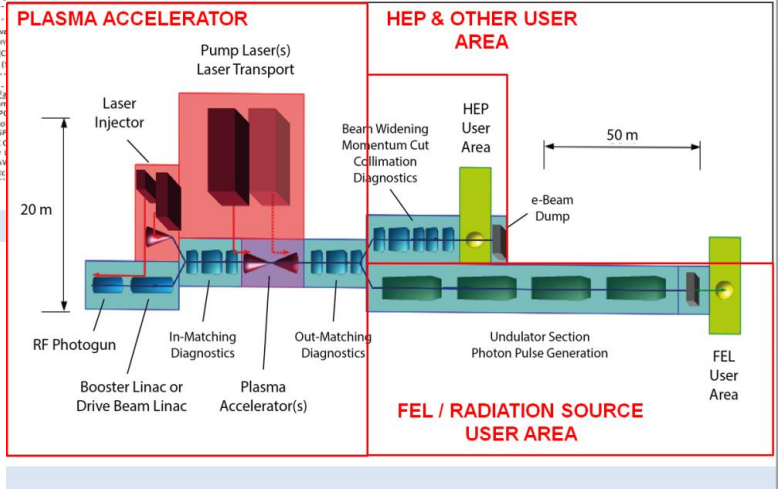
Participating Institutions



Work Breakdown Structure



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