CONSORTIUM

60 institutions and companies from 16 countries have signed a Consortium Agreement for EuPRAXIA, either for ESFRI or the Preparatory Phase project or both.

- Istituto Nazionale di Fisica Nucleare, Italy (Coordinator)
- Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenible, Italy
- · ALBA-CELLS, Spain
- · Amplitude, France
- Instituto Superior Técnico, Portugal
- Centro de Láseres Pulsados Ultracortos Ultraintensos, Spain
- Centre National de la Recherche Scientifique. France
- CERN
- Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France
- Consiglio Nazionale delle Ricerche, Italy
- Deutsches Elektronen
 Synchrotron DESY, Germany
- Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Elettra Sincrotrone Trieste, Italy
- ELI-ERIC, Czech Republic
- Ferdinand-Braun-Institut, Germany
- Forschungszentrum Jülich, Germany
- Fraunhofer-Institut für Lasertechnik, Germany
- GSI Helmholtzzentrum für Schwerionenforschung GmbH, Germany
- Hebrew University of Jerusalem, Israel
- Heinrich-Heine-Universität Düsseldorf, Germany
- Helmholtz-Institut Jena, Germany*
- Helmholtz-Zentrum
 Dresden-Rossendorf, Germany
- Imperial College London, UK
- Institute for Molecular Science, National Institutes of Natural Sciences, Japan*
- Institute of Accelerating Systems and Applications, Greece
- Institute of Plasma Physics and Laser Microfusion, Poland
- Kansai Photon Science Institute, National Institutes for Quantum and Radiological Science and Technology, Japan*
- Karlsruher Institut für Technologie, Germany

- Lawrence Berkeley National Laboratory, USA*
- Łódź University of Technology, Poland
- Ludwig-Maximilians
 Universität München, Germany
- Lund University, Sweden
- Military University of Technology, Poland
- Narodowe Centrum Badan Jadrowych, Poland*
- National Technical University of Athens. Greece*
- · Osaka University, Japan*
- Paul Scherrer Institut PSI, Switzerland
- Pecsi Tudomanyegyetem
 University of Pecs, Hungary
- RIKEN SPring-8 Center, Japan*
- Sapienza Università di Roma, Italy
- Science and Technology
 Facilities Council, UK
- Shanghai Jiao Tong University,

 Ching*
- Swiss Federal Laboratories for Materials Science and Technology, Switzerland
- Synchrotron SOLEIL, France
- Szegedi Tudomanyegyetem, Hungary
- Thales Las France. France
- The Queen's University of Belfast,
- Universite' Cote Azure, France*
- Università degli Studi di Milano-Bicocca, Italy
- Università degli Studi di Roma "Tor Vergata", Italy
- University of California Los Angeles, USA
- University of Liverpool, $\ensuremath{\mathsf{UK}}$
- University of Manchester, UK*
- University of Oxford, UK
- University of Palermo, Italy*
- University of Strathclyde, UK
- · University of Warsaw, Poland
- University of York, UK
- Warsaw University of Technology, Poland*
- Wigner Research Centre for Physics, Hungary

* Observer

European plasma research accelerator with excellence in applications

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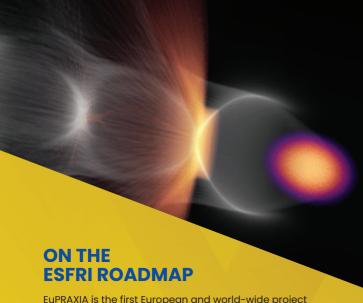
DESIGNING THE FUTURE

www.eupraxia-pp.org www.eupraxia-facility.org



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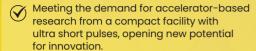




EuPRAXIA is the first European and world-wide project that develops a dedicated particle accelerator research infrastructure based on novel plasma acceleration concepts and laser technology. It is ultimately expected to boost the expertise of the European scientific communities in compact accelerator technologies.

EuPRAXIA was included in the European Strategy Forum on Research Infrastructures (ESFRI) roadmap for strategically important research infrastructures in June 2021 as a European priority.

Together with the EuPRAXIA Preparatory Phase project, a number of initiatives support the realization of the EuPRAXIA infrastructure. These are the EuPRAXIA Doctoral Network, dedicated to training; the EuPRAXIA Advanced Photon Sources, developing a betatron radiation source and high power and high repetition rate laser systems; and EuPRAXIA@SPARC_LAB, dealing with the beam driven site implementation in Frascati (Italy).



Addressing the needs for more cost-efficient, reduced size, innovative and sustainable particle accelerator facilities.

Keeping European accelerator innovation world-leading and competitive in an international race towards the first compact accelerator facility.

EUPRAXIA PREPARATORY PHASE

The EuPRAXIA Preparatory Phase project is developing the organizational, legal, financial and technological aspects of EuPRAXIA, following the recommendations of ESFRI to implement a truly European Research Infrastructure.

The project comprises the following work packages:

- WP1 Coordination & Project Management
 Supervise and coordinate EuPRAXIA-PP work
 package tasks.
- WP 2 Dissemination & Public Relations
 Disseminate the content produced in EuPRAXIA-PP.
- WP 3 Organization & Rules

 Develop the organizational model of EUPRAXIA.
- WP 4 Financial, Legal Model & Economic Impact
 Develop the financial and legal model of EUPRAXIA.
- WP 5 User Strategy & Services
 Define a list of services and access policy to users.
- WP 6 Membership Extension Strategy
 Outreach to European and international communities.
- WP7 E-Needs & Data Policy
 Define E-Needs and Data Policy.
- WP 8 Theory & Simulation
 Theory and simulation of plasma accelerators and applications.
- WP 9 RF, Magnets & Beamline Components
 R&D of RF, magnets, and beamline components.
- WP10 Plasma Components & Systems
 Design of plasma components and related systems.
- WP11 Applications

 Development of applications and delivery into user areas
- WP12 Laser Technology & Liaison to Industry

 Technical design for the laser-driver of the 2nd site.

 Liaise with industry to deliver a robust laser-driver.
- WP 13 Diagnostics
 Diagnostics for particle and photon beams.
- WP14 Transformative Innovation Paths
 Hybrid concepts, novel schemes, compact
 undulators, etc.
- WP 15 TDR EuPRAXIA@SPARC_LAB (beam-driven plasma)
 Preparation of TDR for beam-driven site
 of EuPRAXIA.
- WP 16 TDR EUPRAXIA Site 2 (laser-driven plasma)
 Finalize the evaluation criteria for the laser-driven site.

ECONOMICAL ALTERNATIVE TO RE-BASED ACCELERATORS

In the long term, EuPRAXIA aims to establish the scientific and technological foundations upon which a new market (and a new industry) for non-radiofrequency-based accelerators could emerge, characterized by a much shorter length and potentially much lower costs than RF-based accelerators.

Because of their reduced cost and size, plasma accelerators would clearly constitute an economically attractive alternative to RF-based accelerators.

SERVICE TO USERS

EuPRAXIA envisions an electron beam energy of 1 to 5 gigaelectronvolts and a beam quality (single pulse) sufficient for multiple applications.

EuPRAXIA will deliver ultra-short and intense pulses of electrons, positrons, photons and X rays to users from science, industry and health.

Its performance goals will enable versatile applications in various domains, e.g. as a compact free-electron laser, compact sources for medical imaging and positron generation, table-top test beams for particle detectors, as well as deeply penetrating X-ray and gamma-ray sources for material testing.

INDUSTRIAL LEADERSHIP

The EuPRAXIA technology is closely linked to the European industry, and in particular to the high-power laser industry.

The high demands of the EuPRAXIA project inspire and foster technological progress in this field, keeping the European laser industry at the leading edge of the sector.

The European industry will directly profit from the success of bringing plasma accelerators to the users, creating new market opportunities and conditions for the emergence of a European industrial leadership in compact accelerator solutions.