CONSORTIUM

53 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 Technologies,** France
- **Instituto Superior Técnico,** Portugal
- **Centre for Ultraintense Pulsed Lasers,** 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 Institute for Laser Technology,** Germany
- **Hebrew University of Jerusalem,** Israel
- **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
- **Osaka University,** Japan
- **Pecsi Tudomanyegyetem – University of Pecs,** Hungary
- **RIKEN SPring-8 Center,** Japan
- **Science and Technology Facilities Council,** UK
- **Shanghai Jiao Tong University,** China
- **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,** UK
- **Università degli Studi di Roma "La Sapienza",** Italy
- **Università degli Studi di Roma "Tor Vergata",** Italy
- **University of California Los Angeles,** USA
- **University of Liverpool,** UK
- **University of Manchester,** UK
- **University of Oxford,** UK
- **University of Strathclyde,** UK
- **University of Warsaw,** Poland
- **University of York,** UK
- **Warsaw University of Technology,** Poland
- **Wigner Research Centre for Physics,** Hungary

European plasma research accelerator with excellence in applications

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DESIGNING THE FUTURE

www.eupraxia-facility.org

This project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No. 101079773. It is supported by in-kind contributions by its partners and by additional funding from UK and Switzerland.

EuPRAXIA
Preparatory Phase

TOWARDS REVOLUTIONARY APPLICATIONS AND BENEFITS FOR SOCIETY

ON THE ESFRI ROADMAP

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).

- Meeting the demand for accelerator-based research from a compact facility with ultra short pulses, opening new potential for innovation.
- 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:

WP 1	**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.
WP 7	**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.
WP 10	**Plasma Components & Systems**	Design of plasma components and related systems.
WP 11	**Applications**	Development of applications and delivery into user areas.
WP 12	**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.
WP 14	**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 RF-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.