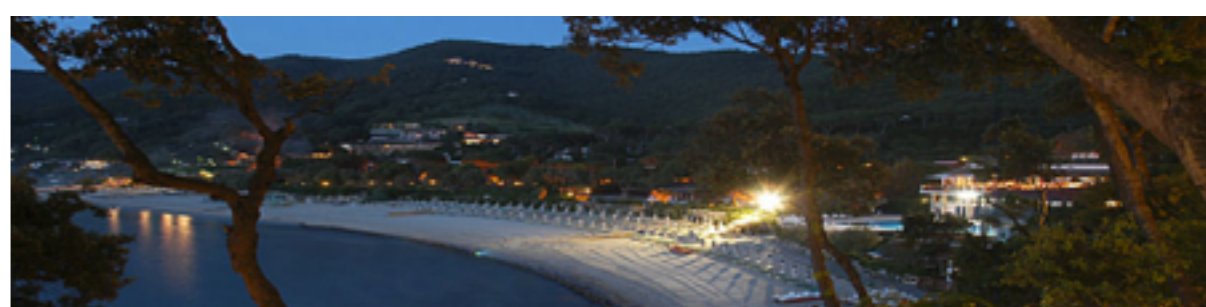


EUROPEAN NETWORK FOR NOVEL ACCELERATORS



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Hotel Hermitage, La Biodola Bay, Isola d'Elba, Italy

**S-ST4: Distributed Plasma Accelerator
Landscape in Europe and Technical
Progress towards Applications
(EuPRAXIA ESFRI and others)**

**Riccardo Pompili
(INFN-LNF)**

and

**Enrica Chiadroni
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Istituto Nazionale di Fisica Nucleare
LABORATORI NAZIONALI DI FRASCATI

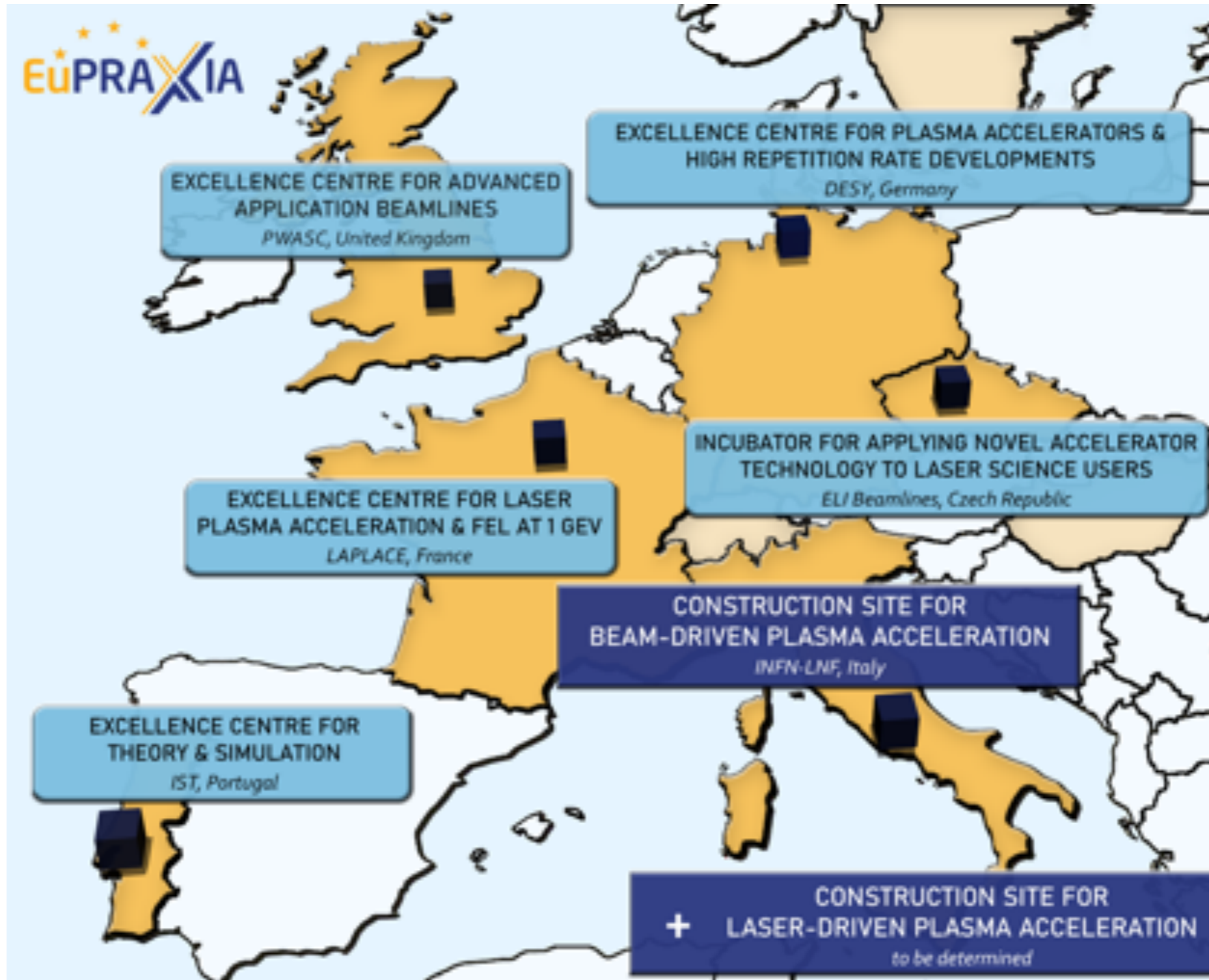


SAPIENZA
UNIVERSITÀ DI ROMA

- ❖ EuPRAXIA (R. Assmann, DESY&INFN)
 - ❖ *First ever plasma accelerator project in the ESFRI Roadmap*
- ❖ Status of the EuPRAXIA@SPARC_LAB project (M. Ferrario, INFN-LNF)
 - ❖ *PWFA-driven test user facility*
- ❖ Laser-plasma acceleration at ELI-Beamlines – (A. Molodochentsev, ELI-Beamlines / Institute of Physics of CAS)
 - ❖ *Laser development and experimental achievements for novel applications*
- ❖ Plasma Acceleration at EPAC (R. P. Pattathil, RAL)
 - ❖ *Update of the Extreme Photonics Applications Centre, a new 10 Hz Petawatt laser facility for LWFA research and its applications*
- ❖ PALLAS, a laser-plasma accelerator test facility, development status (K. Cassou, IJC lab)
 - ❖ *A laser-plasma injector accelerator (LPI) test facility*



- ❖ ARES at DESY, with femtosecond synchronization and high stability infrastructures towards advanced accelerator applications (F. Burkart, DESY)
 - ❖ *High quality, highly stable electron beams for advanced applications*
- ❖ Plasma-wakefield acceleration at high repetition rates (R. D'Arcy, DESY)
 - ❖ *Most recent results with an outlook towards reaching a practical solution in the future*
- ❖ Design of plasma sources for compact accelerators (A. Biagioni, INFN-LNF)
 - ❖ *Control of plasma stability, uniformity and reproducibility*
- ❖ Stable and high quality electron beams from staged laser and plasma wakefield accelerators (S. Karsh, LMU)
 - ❖ *Stability limits and potential emittance improvement for such a staged wakefield accelerator scenario*
- ❖ Overview of betatron radiation sources and applications (S. Mangles, Imperial College)
 - ❖ *x-ray generation by laser wakefield accelerators: ultrafast duration, smooth broadband spectrum and micrometre sized source*





- ❖ Important milestones for the next decade are
 - ❖ Beam quality improvement (energy spread and emittance, in particular, as required by specific applications)
 - ❖ Stability improvement
 - ❖ Reproducibility
 - ❖ Staging
 - ❖ Repetition rate increase
- ❖ Scientific and technological efforts mandatory to guarantee stable and reproducible operation of high brightness plasma-based accelerators
 - ❖ Proof-of-principle experiments
 - ❖ R&D on ancillary components
 - ❖ Industrial network
- ❖ Consolidation of the plasma-acceleration community (e.g. training of personnel and students) and education of dedicated users to let facilities run routinely