DOTT. MASSIMO FERRARIO
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The EuPRAXIA project: a plasma-based accelerator user facility for the next decade.

High energy particle beams with extreme luminosities and ultra-bright beams for energetic radiation sources are ubiquitous tools for studying the structure of matter in a wide range of spatial and temporal scales. Last century saw huge progress in the development of very efficient radio-frequency based accelerators. However, these require large scale research infrastructures in order to reach highest beam energies, such as the Large Hadron Collider (LHC). In order to reduce the size, costs and complexity of these facilities, particle and laser driven plasma wakefield acceleration are very promising alternatives. Intense R&D is still required so that the output beam quality can match the performance of cutting edge RF accelerators. In this talk we will introduce the new acceleration techniques mechanisms and we will discuss the most interesting results and applications obtained so far, including a description of the new accelerator facility EuPRAXIA based on plasma modules to be built in Frascati in the next decade.

Massimo Ferrario is currently Senior Scientist at INFN, coordinator of the SPARC_LAB facility at the Frascati INFN Laboratories and Project Leader of the EuPRAXIA@SPARC_LAB facility. In the last 30 years Massimo has been working in the field of high brightness photoinjectors, free electron lasers and advanced accelerator concepts including plasma accelerators. He is co-chair of the workshop series: "European Advanced Accelerator Concepts" together with Dr. R. Assmann (DESY/INFN) since 2013. He is a member of the CERN Accelerator School (CAS) where he has given several lectures about the Physics of High Brightness Beams and Advanced Accelerator Concepts. He is also currently teaching "High Brightness Beam Physics" at the University of Roma "La Sapienza" for the Accelerator Physics PhD program.