Overview of Laser/Beam Plasma Interaction and Inertial Confinement Fusion Research and Developments in Italy

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Italy has a long and prestigious history of research activity related to the field of laser/beam plasma interaction and inertial confinement fusion, dating back to the last century and spanning many decades. Pioneering experiments and theoretical research have been conducted in our country in this broad field, providing our research groups with the knowledge and expertise necessary to build significant progress and development.
This research area encompasses laser and particle beam interaction with plasmas, inertial confinement fusion, hydrodynamics and instabilities in laser plasmas, high-energy-density plasmas, laser- and plasma-based radiation and particle sources, ultra-intense laser interaction, high-field physics. Related research activities include theoretical and numerical modelling, preparation and execution of experiments, and development of tailored diagnostics.
In this overview we will illustrate current Italian activities on this field, relating them to the international context and to the prospects of this sector.