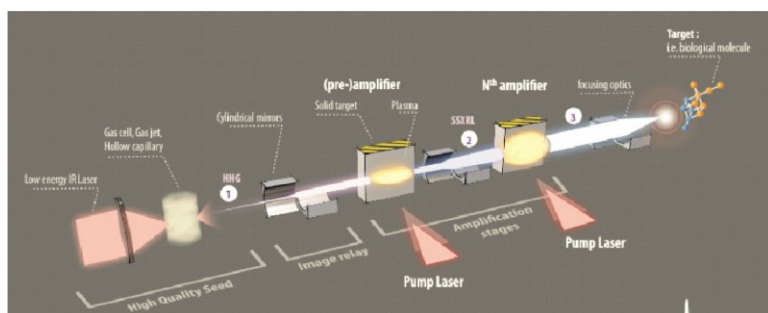


30 Gennaio 2012 ore 14.00

Aula Bruno Brunelli

The brightest issues of 10 years of seeding soft X-ray lasers

Dr. Philippe Zeitoun



Since the very first experiment on soft X-ray laser in the early 70's, these lasers attracted a lot of interests for applications. The short wavelength opens up the possibility of getting new insight on matter by performing high-resolution images. However, contrary to most lasers, and despite many attempts, soft X-ray lasers were not demonstrating coherent beam for very long time. Also, at small spatial-scale matter tends to evolve very quickly requiring most often to use sub-picosecond flash of X-rays for catching a frozen picture. However, for decades soft X-ray lasers were blocked to pulse duration above several picoseconds. These two major bottlenecks, since 2001, my team and myself, we are working both theoretically and experimentally in order to achieve the next generation of soft X-ray lasers using a laser-created plasma as amplifier. Our goal is to achieve fully coherent, femtosecond soft X-ray lasers able to drive the most exciting and complex applications. From our first concept, to the first experiment and the last numerical studies, we discover that seeding soft X-ray lasers opens an outstanding sight inside atomic and plasma physics. Finally, we will expose a detailed design of a possible second generation soft X-ray laser able to produce the most intense beam worldwide, about 10,000 times more intense than best previous soft X-ray lasers.