

Plenarvortrag PV VIII Do 9:00 Theater Vorpommern
X-rays and EUV from laser plasmas: generation and applications — ●PAOLO DI LAZZARO — ENEA Frascati, Italy

More than 15 years ago, the Excimer Laser Laboratory at ENEA Frascati designed and made a laser-plasma source emitting pulsed radiation in the spectral range 50 eV - 2000 eV. This plasma source has been used for high-resolution atomic spectroscopy, in vivo contact microscopy of biological samples, induced DNA damage, micro-radiography, generation of sub-micron luminescent pattern on Lithium Fluoride films for miniaturized active optical devices. More recently, we built-up a prototype of an Extreme UltraViolet (EUV) exposure tool designed to print arbitrary shaped pattern with sub-100-nm spatial resolution on commercial photoresists and on LiF films, investigating the possibil-

ity to print the high-resolution pattern in a single-shot exposure, thus avoiding the severe blurring problem related to the nm-scale vibrations of the optics that affect the standard multi-shots EUV exposure tools for lithography.

In this lecture, we present the design elements and the experimental performance of the main components of the EUV exposure tool prototype, including the plasma source driven by the high-output energy excimer laser facility Hercules, the patent-pending debris mitigation system, the optical set-up, and the novel alignment technique of the Schwarzschild objective that is based on the well known Foucault test. A summary of the main experiments done by the laser-plasma source on contact microscopy, DNA-damage and photonics will be also presented.