Contribution ID: **175** Type: **talk**

Laser-driven protons for nanomaterial production

Wednesday, 16 September 2015 18:25 (15 minutes)

The enhancement and control of growing techniques for nanomaterials, in particular nanocrystals, is one of the current key challenges in nanoscience and nanotechnology. The possibility to obtain routinely nanocrystals with controlled shape, dimensions and crystallinity is a challenge that many research groups are pursuing and strategically important for manifold applications.
The irradiation of a bulk target by high energetic laser-generated protons can generate the temperature and pressure conditions required to grow crystalline structure. The short bunch duration of the exhibiting proton beam limits the nucleation time to the range of ps-ns ensuring the stop of nucleation at crystallinity phase without aggregation of amorphous structures.
We will show how laser-generated protons can be used to grow and obtain nanostructured surfaces where the constituent nanomaterials are nanocrystals with well defined shape, dimensions and crystallinity. We control the nanocrystals properties tuning the laser-accelerated proton beam characteristics (energy, pulse duration and fluence), i.e. working on the source and the geometry in the irradiation process.

Primary author: ANTICI, Patrizio (LNF)

Co-authors: Mrs MORABITO, Antonia (INFN / ELI-ALPS); XU, Fang (CS); Mr TOBIAS, Javier (INFN / ELI-ALPS); Dr BARBERIO, Marianna (INFN-CS); SCISCIO', Massimiliano (ROMA1); Mrs VELTRI, Simona (INRS); Dr CHEN, Sophia (CNRS/LULI); Mr GANDOLF, Thomas (LULI)

Presenter: ANTICI, Patrizio (LNF)

Session Classification: WG2 - Ion beams from plasmas

Track Classification: WG2 - Ion beams from plasmas