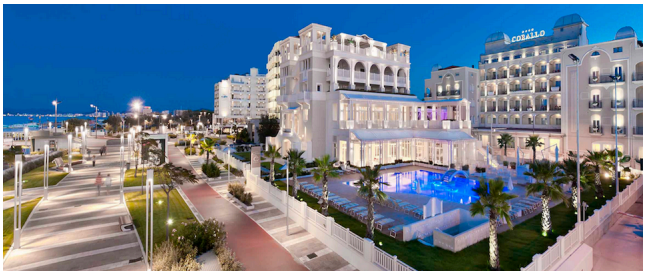

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X-ray channeling for imaging and spectroscopic applications at XLab Frascati

Thursday, 8 June 2023 17:30 (20 minutes)

X-ray applications are widely used in the world. By the way, due to the high interaction between radiation and matter, the possibility to have optical devices suitable for X-ray radiation is not trivial. In the last 30 years, the studies concerning novel advanced material have fostered the development of several solutions for more efficient X-ray lens, necessary to perform high spatial resolution in spectroscopy as well as for imaging techniques applied in Medicine/Pharmacology, Cultural Heritage, Geology and Environment, Electronics, Aerospace, etc...

The main accent will be highlighted to advance tools for X-ray both Imaging and Spectroscopy based on combination of modern polycapillary optics and developed reconstruction software together with commercially available systems.

Recent results (principally in three main fields, such as high resolution X ray Imaging, micro X Spectroscopy and micro Tomography) obtained at XLab-Frascati will be discussed. In particular, we will show the last results concerning our XRF facility and the new experimental setup dedicated for Tomography:
1) "Rainbow X-Ray" (RXR) is an experimental station dedicated to 2D/3D XRF μXRF spectroscopy, opened for users at LNF XLab-Frascati, optimized for most of X-ray analytical research fields. The basic principle of the station is in the use of various geometrical combinations of polycapillary optics for X-ray beam shaping (focusing/collimation) at specially designed laboratory unit. The flexible RXR layout allows investigating specimens of the dimensions ranging from several millimeters up to half meter and weighting up to several tens of kilograms.
2) "Computed Tomography Station" (CTS) is a measuring station for high precision tomography. Developed as part of a Premiale project, the station, equipped with a micro-focusing source (5 μm on the anode), high precision mechanics and high-resolution CCD detector (10.4 μm per pixel), through the phase retrival technique CTS resolution is estimated in 600-700 nm per voxel. The CTS experimental setup is commissioned ad the end of 2022 and will be ready and opened for users in the beginning of the 2023.

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