

First announcement

"Channeling 2004"

Workshop on Charged and Neutral Particles

Channeling Phenomena

Frascati (Rome), Italy

November 2 - 6, 2004

(<http://www.lnf.infn.it/conference/channeling2004>)

Organized by

Istituto Nazionale di Fisica Nucleare – Laboratori Nazionali di Frascati

In cooperation with and sponsored by

SPIE – The International Society for Optical Engineering

UNISANTIS S.A., Switzerland

ISMN CNR - Institute of Nanostructured Materials

Objectives and scopes

Since the middle of the last century, Frascati's National Laboratories (LNF - INFN) are well known in the world for pioneering research in the particle interaction and synchrotron radiation physics fields. Good experience in designing accelerators, storage rings and beamlines for synchrotron radiation allows presently to the LNF to be in the frontier for the construction of new X-ray generation sources, as FEL.

Interaction of different kinds of radiation with matter is being studied since scientific community started to operate with penetrating radiations. Among different research directions, the coherent phenomena of the radiation passage through solids, as channeling in crystals, attracts attention because it can create a strong flux of photons in various energy intervals, starting from optical frequencies, via soft and hard X-ray, up to γ -ray frequencies. The latter makes this field of research more and more attractive, due to the importance of creating new intensive photon sources like the next generations of synchrotron, free-electron laser, Z-pinch machines, etc. Another approach to the problem of searching for intensive radiation sources is to increase the radiation density of existing X-ray and γ sources that can be solved by means of novel optical elements, for instance polycapillary optics. The passage of charged particles through periodic systems and the passage of neutral particles (photons, neutrons) through capillary systems, even if strongly different by nature, have much in common, as both can be described within the frame of channeling theory. Therefore, the use of this analogy can significantly simplify researches in both areas.

The main purpose of "Channeling 2004" workshop is to discuss results and to exchange experiences and ideas among various groups in the world, such as to lay the basis for future research activities, and to prepare a new International network project on Coherent Scattering Phenomena for Radiations in Solids.

Topics for discussion

- Radiation of relativistic charged particles in periodic structures
- Coherent scattering of electrons and positrons in crystals
- Channeling radiation of electrons and positrons in crystals
- Channeling of X-rays and neutrons in capillary systems (micro- and nano-channeling)
- Novel types of sources for electromagnetic radiation (FEL, powerful X-ray sources)
- Applications of channeling phenomena (novel radiation sources, X-ray waveguides, capillary/polycapillary optics)

Technical Program, Proceedings, Exhibition

The workshop program will include invited presentations by the famous scientists in the field of particle channeling physics, powerful X-ray sources and FEL physics, selected oral presentations, and poster sessions.

It is planned to publish the full texts of all the papers in a special issue of the SPIE Proceedings Series.

During the workshop, an exhibition, including new X-ray instruments and devices recently developed by UNISANTIS SA (Switzerland) and ASSING SpA (Italy), will be organized.

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