

# Università degli Studi di Trieste

## Dipartimento di Fisica

# Alumnorum Colloquia

## Anna Bergamaschi

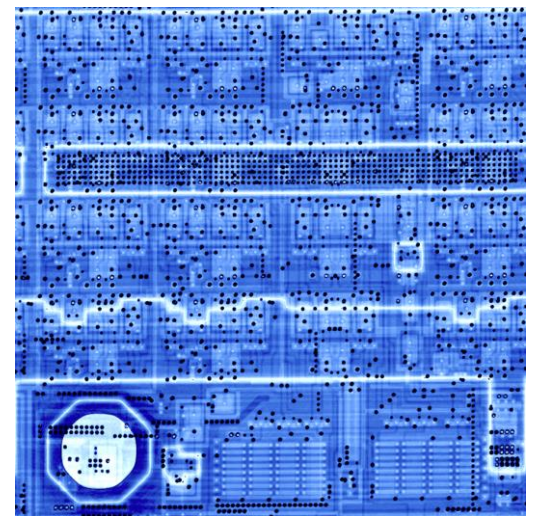
Paul Scherrer Institut, Switzerland

October 6, 4.30 PM - Lecture room A, F building, Physics Dept. - via Valerio, 2 – Trieste

## Hybrid Detectors for Synchrotron Radiation and XFEL Experiments



The X-ray detector, as well as the radiation source and the sample, play a fundamental role in the success of synchrotron radiation research. In the last years, the hybrid detectors developed at the Swiss Light Source enabled scientific experiments which would not have been possible without them. Single photon counting detectors have become state of the art in many diffraction applications and provide stable and reliable operation at synchrotrons all over the world. In this presentation, the requirements given by challenging synchrotron experiments will be described from the point of view of the detectors. The development of hybrid detectors carried out at the Swiss Light Source will be reported, concentrating on the advantages of direct X-ray detection and on the use of different readout approaches.



In particular, the focus is extending from single photon counting detectors for synchrotrons to charge integrating detectors for X-ray free electrons lasers. These offer the same data quality as single photon counters and will become of use also at synchrotrons, particularly for high flux experiments at next generation facilities.

Moreover the low noise and small pixel pitches achievable thanks to technological improvements and the understanding of the charge transport processes inside the silicon sensor, open the way for the use of hybrid detectors in soft X-ray, energy dispersive and high resolution applications, which was considered unfeasible until a few years ago.

Organizzazione a cura di: M. Girardi, E. Gozzi, G. Pastore, R. Rui, E. Vesselli

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**Everyone interested in the topic is welcome to attend**

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