Proposta di tesi magistrale

- **Thesis level:** Master
- **Corso di Laurea:** Physics
- **Thesis type:** Experimental
- **Title:** Fiber scintillators for X-ray detection on RFXmod2 experiment.
- **Thesis description:**

X-ray emission diagnostics are versatile tools which return information on plasma temperature, density, ion content and fast dynamics. In a context of growing interest in electron distribution features and reconnection dynamics, development of soft x-ray and hard x-ray diagnostics becomes mandatory for the operation of the RFXmod2 experiment.

The proposed thesis is an application study of organic fiber scintillators coupled to fast photodiodes as non-expensive, high dynamic range tool for x-ray spectra characterization. A fiber arrangement can ideally take advantage of large collection area for continuous detection in the soft x-ray range and sufficient energy resolution for pulse height analysis in the hard x-ray range (>10-20 keV). Moreover, detectors can be placed at a sufficient distance from plasma, easing temperature control and mitigating the effect of EM noise sources.

This project will be conducted testing fiber scintillators and various detectors, using an x-ray tube as the source of radiation. In particular, key issues that will be studied are fiber collection and transmission efficiency, evaluation of reflective coating performance, fiber/fiber or fiber/detector coupling strategies, development of front-end fast electronics**.**

- **Internal tutor (s):** A. Fassina - alessandro.fassina@igi.cnr.it, P. Franz paolo.franz@igi.cnr.it
- **Academic tutor:** L. Giudicotti
- **Head of research unit:** L. Marrelli
- **Required Skills** (if necessary):---
- **Submission date:** October 10th, 2020
- **Status:** not assigned