

PIANOFORTE Travel activity report

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“Marko Moscovitch” Summer School – “Detector design and modelling, production and characterisation”

The current summer school was held in September 2023, in Pisa, Italy. The subject of the summer school was the design, production and characterisation of detectors for use in the ionizing radiation field.

The school consisted both of lectures, given by specialists on each topic, and of laboratory sessions, where experiments with certain detectors were conducted. The first day, the courses were relevant to general aspects of ionizing radiation and the estimation of uncertainties in the measurements, which is a crucial topic in the detection methodology.

The lectures of the second day included techniques of luminescence dosimetry (thermoluminescence, optically stimulated luminescence and radiophotoluminescence). This part of the school was exceptionally enlightening for me, since my PhD topic encounters the first two techniques, and it helped me to gain deeper understanding and knowledge for several perspectives. During the same day, two more topics were covered, track detectors for neutron detection and Monte Carlo modelling of the detectors.

During the third day, the semiconductor detectors were covered, as well as another dosimetric methodology, called electron paramagnetic resonance. A lecture regarding emergency dosimetry was given, with examples on the selection of the most appropriate technique in many realistic scenarios. Microdosimetry was also taught, which is a highly important topic, together with the development of dosimeters that are suitable for this scale.

The last day concerned a cancer treatment application called FLASH radiotherapy. The lectures included the general aspects of this technique and the obstacles that the common dosimeters face during this procedure. Potential dosimetry techniques and materials had been presented. The day finished after a planned visit in the FLASH radiotherapy room. During the first three days, some laboratory sessions were held, considering Geiger counters, gamma spectrometers and neutron detectors.

This summer school was an amazing opportunity for me to broaden my knowledge on radiation dosimetry and consider more aspects that I can investigate and implement in my PhD research. Therefore, I would like to thank the PIANOFORTE travel grant program for offering me this chance.

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