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APPLICATIONS X-RAY DETECTION AND ORGANIC SEMICONDUCTORS

A thin film of organic material can turn into a powerful X-ray detector. A research team coordinated by researchers from the University of Bologna and the INFN Bologna Division has identified several characteristics thanks to which it is possible to maximise this technology's capabilities. The study, published in Nature

Communications, shows how it is possible to improve both the detection limitation and the sensitivity of this innovative technology, which has potential applications in different fields, from medical diagnostics to public safety, from space applications to the preservation of cultural heritage and environmental monitoring. The results are a crucial step in understanding the parameters and physical processes that control the detection of X-rays by organic thin film semiconductors (a few hundred nanometres): a fundamental knowledge for the effective implementation of ionizing radiation detectors based on such materials in real life applications.

Since they are able to alter the structure of molecules and atoms, X-rays can prove to be harmful to health and to the functioning of electronic instruments and devices. This is why it is very important to monitor and control this type of radiation, especially in environments such as radiation therapy medical facilities, space missions, nuclear waste management, high energy physics experiments.