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## **GammaEDU: an innovative tool for sensitizing society to natural radioactivity**

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Environmental radioactivity is all around us, but the perception of the hazard deriving from this phenomenon is often altered by widespread negative feelings, misconceptions and the shortage of didactic paths dealing effectively with the topic. Ingenious methods for promoting knowledge exchange between researchers, general public and students are increasingly in demand. Traditional physics lessons need to embrace new smart technological tools more familiar to new generations.

We developed a powerful and stand-alone portable detection system called GammaEDU. This device operates autonomously to quantify the presence of radioactive elements in the environment through the detection of gamma rays emitted by their decays and can exchange data with users' mobile devices via Bluetooth wireless connection.

Through the easy to use GammaEDU Android app the layman operator visualizes in real time the gamma ray spectrum acquired by the detector. The main spectrum structures are automatically highlighted by the software, which allows to take the GPS coordinates and shoot a picture of the surrounding environment. An automatic algorithm processes the acquired spectrum on-board, obtaining the estimated abundances of the different radioisotopes. The data are saved in a KMZ file reporting the measurement results ready to be visualized in a Google Earth and shared on cloud services or social-media applications.

GammaEDU was successfully tested during several educational activities to explore in-situ environmental radioactivity with the general public and with university and lower-level students. Thematic maps of natural radioactivity were created and found to be an effective educational tool for heightening awareness of natural hazards and break out of traditional communication approaches.