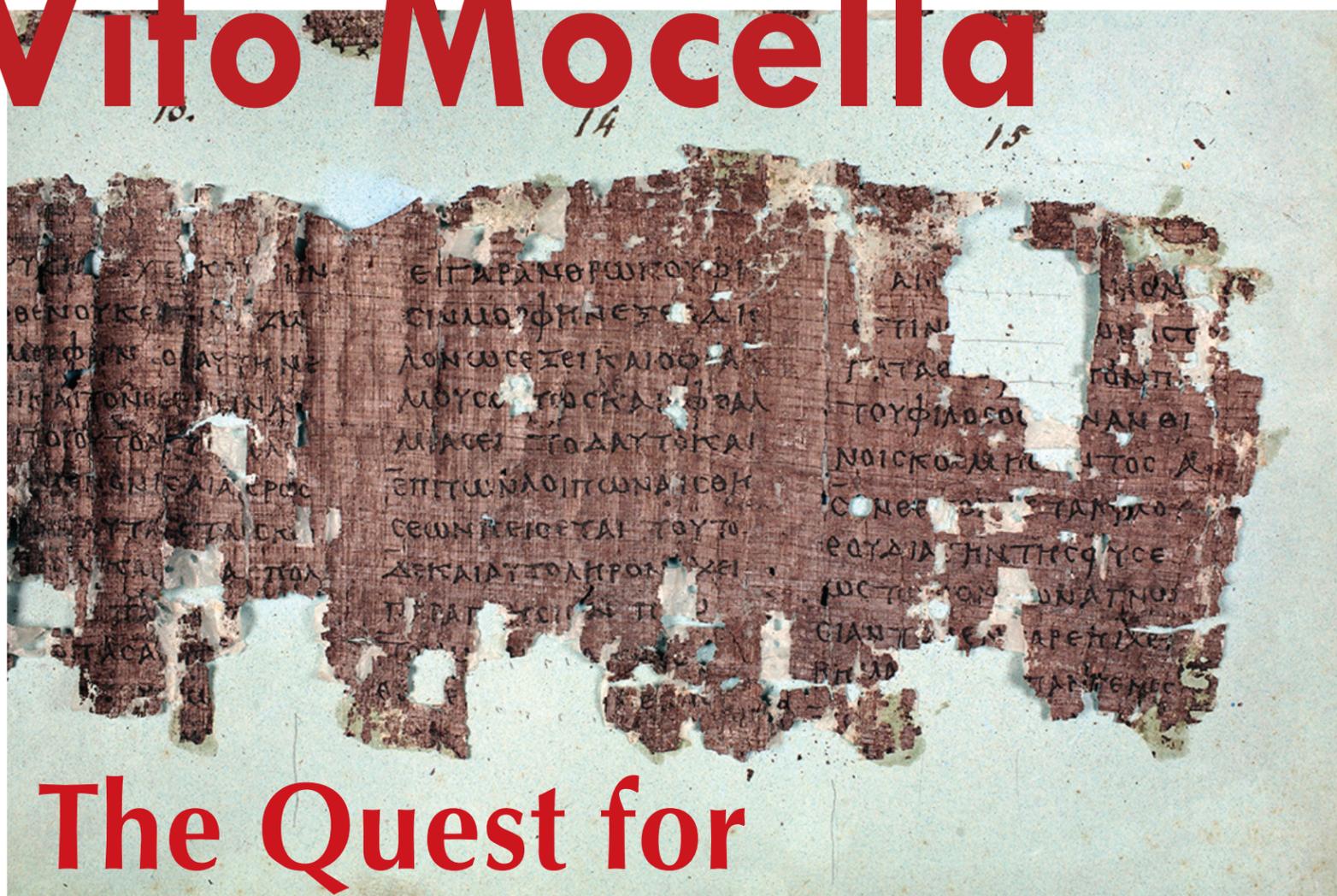


Vito Mocella



The Quest for Lost Ancient Literature

We present the first experimental demonstration of a non-destructive technique that reveals the text of a carbonized and thus extremely fragile Herculaneum papyrus. Buried by the famous eruption of Vesuvius in 79 A.D., the Herculaneum papyri represent a unique treasure for humanity. Overcoming the difficulties of the other techniques, we prove that the x-ray phase contrast tomography technique can detect the text within scrolls thanks to the coherence and high-energy properties of a synchrotron source. This new imaging technique represents a turning point for the study of literature and ancient philosophy, disclosing texts that were believed to be completely lost. In order to improve the imaging technique, we performed an extensive experimental analysis of the ink composition using a combination of synchrotron techniques at the ESRF, discovering the presence of metal in the ink of two Herculaneum papyrus fragments and proving that metals were used in ink several centuries earlier than previously believed.

Vito Mocella graduated (Laurea) in Electronic Engineering at the "Federico II" University of Naples in 1995. In 1999 he earned the French Ph.D. in Physics at European Synchrotron Radiation Facility (ESRF). From 1999 to 2001 he worked with the Optics Group of ESRF and with the SRI-CAT Group of the Advanced Photon Source. In 2002, he joined the Italian National Council of Research working on x-ray optics, photonic crystals, and metamaterials. In 2007, he was nominated Cavaliere all'Ordine del Merito della Repubblica from the Italian President. He teaches nanophotonics and metamaterials at University of Napoli "Federico II" and has been a visiting professor at University of Montpellier (France) in 2010, a visiting scientist at Boston University in 2011, and a regularly visiting scientist at ESRF since 2004. In 2015, he joined the General Management Board of the Italian National Research Council as the only representative of the national scientific community. His collaborative work has led to ground-breaking research tools for analyzing previously unreadable texts such as the fragile ancient scrolls from Herculaneum charred in the eruption of Mt. Vesuvius in 79 AD. Recent publications on the application of synchrotron radiation to Herculaneum papyri received huge interest from the international media, as well as the scientific community.

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