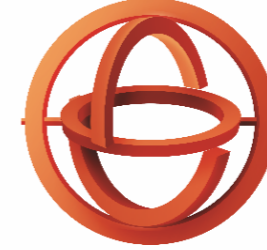


Description of Funded Research Projects

1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers



H.F.R.I.
Hellenic Foundation for
Research & Innovation

Research Project Title:

**Low-Cost Carbon Nanotubes
Photodetectors (\$CNTPD)**

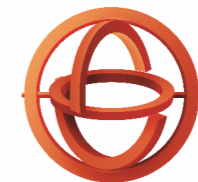
Principal Investigator:
Dimitrios Velesiotis



Popular Title:
Low-Cost Carbon Nanotubes Photodetectors

Scientific Field:
Engineering

Host Institution:
National Center for Scientific Research
“Demokritos”, Greece



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Photodetectors are devices that measure the intensity of electromagnetic wave radiation in a band around a certain wavelength by absorbing the corresponding photons and transforming them to another measurable quantity, usually current or temperature change. They have numerous applications extending in diverse fields like research and space exploration/observation, national security and military, infrastructure/public safety, health and optical communications. However, with the notable exception of the visual spectra and a small neighborhood of wavelengths around it, where Si photodiodes work excellently, the commercial applications are still limited due to the high cost of current technologies.

In the upcoming “Internet of Things (IoT)” era, in which producing data and distributing them in real-time will be common, the need for all kinds of affordable -with high performance- sensors would be a must; non-visible spectra photodetectors would not be an exception to this trend. Moreover, there is still room for developing simple products for standalone applications, as long as the photodetector cost is kept low. Pursuit of developing such products may be done in the innovative process and materials that are used in the framework of Nanotechnology, such as Carbon Nanotubes and Integrated Circuits Processing, which are going to be used during the “Low-Cost Carbon Nanotubes Photodetectors (\$CNTPD) project”. The project’s aim is the fabrication of photodetector prototype systems for a wide range of detected wavelengths, namely from ultraviolet to infrared.

Low-cost devices contribute to the general benefit of society, as innovative products become amply available and, in due time, they transform society. Of course, it would be an exaggeration to say that the “Low-Cost Carbon Nanotubes Photodetectors (\$CNTPD)” project will immediately have the aforementioned impact; however, other high social interest sectors such as health and environmental monitoring could clearly benefit by the development of such sensors. To date examples of a simple UV radiation detector device which calculates the UV index, cost about 35\$ and come at the size of a handheld phone device, which makes their wider use quite cumbersome; although, the potential benefit for public health from the use of such device is quite obvious, especially in countries as sunny as Greece. A successful outcome of the project could lead to much smaller and cheaper devices paving the way to commercial applications crucial for public health.

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By financing the project, HFRI provided a moral reward to the team, as well as the confirmation that our vision can be shared by others; moreover, financing was a boost to the morale of the project coordinator. In a more pragmatic framework and considering the recent difficult years for the Research sector in Greece, financing of the “Low-Cost Carbon Nanotubes Photodetectors (\$CNTPD)” project was crucial for the survival, but more importantly, for the expansion and development acceleration of this scheme.

*The Principal Investigator,
Dimitrios Velesiotis*

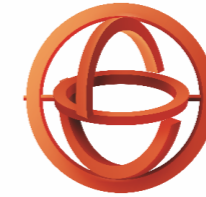
Funding

Amount: **180,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**





H.F.R.I.
Hellenic Foundation for
Research & Innovation

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