One post-doctoral position in the project

**VisorSurf - A Hardware Platform for Software-driven Functional Metasurfaces**

*Europe: Horizon 2020 GA 736876*

The Institute of Electronic Structure and Laser (IESL) of the Foundation for research and Technology Hellas (FORTH), in the frame of the project VisorSurf which is a Research and Innovation action – RIA – (Call: H2020-FETOPEN-1-2016-2017, Proposal number: 736876), funded under H2020-EU.1.2.1. - FET Open, is seeking to recruit one post-doctoral researcher who holds a Ph.D. in Electrical and Computer Engineering in the area of metamaterials or/and in the field of optical/plasmonic/photonic structures.

**Job Description**

Metasurfaces, thin film planar, artificial structures, have recently enabled the realization of novel electromagnetic and optical components with engineered and even unnatural functionalities. These include electromagnetic invisibility of objects (cloaking), total radiation absorption, filtering and steering of light and sound, as well as ultra-efficient, miniaturized antennas for sensors and implantable communication devices. Nonetheless, metasurfaces have presently limited adaptivity and reusability, restricting their applicability to a single functionality per structure. Moreover, designing a metasurface remains a task for specialized researchers, limiting their accessibility from the broad engineering field. VISORSURF proposes a hardware platform-the HyperSurface-that can host metasurface functionalities described in software. The HyperSurface essentially merges existing metasurfaces with nanonetworks, acting as a reconfigurable (globally, locally, upon request or depending on the environment) metasurface, whose properties can be changed via a software interface. This control is achieved by a network of miniaturized controllers, incorporated into the structure of the metasurface. The controllers receive programmatic directives and perform simple alterations on the metasurface structure, adjusting its...
electromagnetic behavior. The required end-functionality is described in well-defined, reusable software modules, adding the potential for hosting multiple functionalities concurrently and adaptively. VISORSURF will study in depth the novel and unexplored theoretical capabilities of the HyperSurface concept. The candidate is expected to conduct pioneering research on the VisorSurf topics, working closely with a highly-interdisciplinary team, including Physicists, Computer Scientists, Hardware Designers and Manufacturers. The applicant should have a strong background in computational electromagnetics, as exhibited by high-quality custom code, proficient knowledge of commercial software packages and high quality publications. Electrical engineers with knowledge spanning across the involved disciplines are especially welcome.

Required qualifications

- Study and parametric assessment of the electromagnetic properties of graphene structures with an emphasis on applications in the THz regime. (20%)
- Analysis and characterization of the electromagnetic attributes of advanced materials (graphene, metamaterials) for the development of enhanced wideband absorbers. Design and development of integrated optical, photonic, and nanophotonic waveguiding devices with an emphasis in silicon forms for interconnections and controllable structures. Investigation of non-linear phenomena in optical waveguides and metamaterials. (20%)
- Development of advanced time- and frequency-domain methodologies in the area of computational electromagnetics for the accurate solution and efficient simulation of the aforementioned problems. (20%)
- Solid experience in code programming via contemporary graphics processing units (GPU) for the significant acceleration of numerical simulations by means of the Compute Unified Device Architecture (CUDA). (20%)
- Strong background in modern computational packages in the area of computational electromagnetics with an emphasis on the finite element (FE) method (in particular the COMSOL™ package), the finite-difference time-domain (FDTD) method (in particular the CST Microwave Studio™ package), and the beam propagation method (BPM). (20%)

Additional qualifications

- Scientific publications in international peer-reviewed journals and international conferences, which substantiate the relevance and solid background with the area optics, photonics, plasmonics, metamaterials/ metasurfaces, graphene, and computational electromagnetics. (10%)

Location: IESL-FORTH, Heraklion Crete GREECE
Start Date: 1st of February, 2017
Project Duration: 12 Months with possibility of extension according to the needs of the project
Monthly budget: approx. 1600 euro (net)
Application Submission
Interested candidates who meet the aforementioned requirements are kindly asked to submit their applications, no later than the **18th of January 2017, 23:59 local Greece time** to the address (hr@iesl.forth.gr), with cc to Dr Maria Kafesaki (kafesaki@iesl.forth.gr).

In order to be considered, the application must include:
- Application Form (please download file from the job announcement webpage)
- Brief CV
- Scanned copies of academic titles
- For male candidates: proof that have completed their military obligations (if any).

Any application received after the deadline will not be considered for the selection

Contact
For information and questions regarding the application and selection procedure, candidates are asked to contact the secretariat (hr@iesl.forth.gr), tel. +30 2810-391301.
For information and questions about the advertised position and the research activity of the group or the institute, candidates are asked to contact Dr Maria Kafesaki (kafesaki@iesl.forth.gr).

Selection Announcement
The result of the selection will be announced on the website of IESL-FORTH.
Candidates have the right to appeal the selection decision, by addressing their written objection to the IESL secretariat within five (5) days since the results announcement on the web. They also have the right to access (a) the files of the candidates as well as (b) the table of candidates’ scores (ranking of candidates results). All the above information related to the selection procedure will be available at the secretariat of IESL-FORTH in line with the Hellenic Data Protection Authority.