Curriculum Vitae

Name: Nikos A. Giannakis
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Date of Birth: 19/01/1980
Nationality: Greek
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Education

Ph.D., Dept. of Electronics, University of Kent (2006-2011).
Subject: Photonic line array of metallic nanoparticles by Embedding method.
Details: The band structure of bound and leaky states was calculated for a line array of cylinders, at different radii. This method was proved to be an efficient way finding the Density of States (DOS) as well as it can treat the open boundary exactly. The vectorial embedding formalism was implemented for a line array of spheres. Exploration of the basis function of magnetic wall boundaries showed convergence. This convergence shows a potential accurate calculation of bound and non-bound states, for the line array of dielectric or metallic spheres.
Supevisor: P.R. Young

M.Phil., Dept. of Physics and Astronomy, Cardiff University (2002-2004).
Subject: Embedding approach to propagation of electromagnetic waves in 2-D.
Details: The embedding method was used in order to calculate the band structure of a 2D lattice of cylinders. The convergence showed to be faster than the standard plane wave methods due to the explicit solution among the cylinders, since the cylinders are replaced by the Green function. The metallic case of cylinders did not show any singularities due to the embedding boundary, this makes the embedding method to treat dielectric and metallic materials without difficulty.
Supevisor: J.E. Inglesfield

Master in Physics, Dept. of Physics and Astronomy, Cardiff University (1998-2002).
Dissertation: Use of the Green functions for the motion of electrons in a 2D corner electron nano-waveguide.
Details: In the 3rd year project the reflection and transmission coefficients were calculated by using the Green function of a square shape, with Neumann boundary conditions
 In the 4th year project by applying the embedding method, the DOS was calculated which shows the bound and resonance states of the system.
Supevisor: J.E. Inglesfield

Experience

Teaching-Research and Development, Institute for International Maritime Studies (IIMS), Greece (2017-currently).
Activity: Teaching; Maritime Robotics and Programming for numerical calculations. Use of the Fabrication Lab (Fab Lab) for the construction of an atomic microscope, Scanning Tunnelling Microscope (STM).

Research in Nanophotonics, Dept. of Electronics, University of Kent, UK (2016-currently)
Activity: Collaboration.
Details: Calculation of Photonic band structure for nano-structures, by using/implementing the embedding method.

Teaching and Lab Organizer, Dept. of Research and Development, City Unity College, Greece (2015-2017).
Activity: Teaching; Fundamentals of Robotics.

Associate Lecturer, in Foundation year Maths, CEWL, University of Kent, UK (2012-2013).
Activity: Module organizer and running this class.

Honorary Researcher, Dept. of Electronics, University of Kent, UK (2011-2013).
Activity: Work on the exact calculation of the leaky states of plasmonic systems by using the embedding method.
Details: During this period a paper, on a line array of 2D metallic cylinders, was prepared and published.

Engineering lab teaching, Dept. of Electronics, University of Kent, UK (2006-2013).
Subjects: Mathematics for engineers, Foundation year laboratory for engineers and physicists, Programming in Matlab, Fundamental robotics class.

Research in plasmonics, School Electronic Engineering, Queen Mary University of London, UK (2005-2006).
Activity: One year contract for applying my knowledge of embedding method in plasmonics. Presentation at conference Photon06.
Details: First calculations on the bound states of a line array of cylinders.
Supevisor: Y. Hao

Multiple scattering technique, Dept. of physics, University of Athens, Greece (2004-2005)
Activity: Use of 3D LKKR method (or multiple scattering method) for the photonic properties of 2D arrays of metallic spheres.
Details: Practice on the formalism and the Fortran algorithm (MULTEM) of LKKR method for metallic spheres.
Supevisor: N. Stefanou

Research in nanowires, Institute of Microelectronics, National Center for Scientific Research "Demokritos", Greece, (2002 and 2003-2004).
Activity: Wavefunction matching technique for 2D nanowires.
Details: A contract related to the numerical Solution of the Schroedinger's equation for the calculation of reflection and transmission coefficients of nanowires. A Fortran program was written for a rectangular sized resonators in nanowires (such as corner). The results had a good agreement with other methods.
Supevisor: X. Zianni

X-ray apparatus support, ESRF, Grenoble, France (13/06/2003-20/06/2003).

Activity: Experiment on X-ray scattering on polymeric materials.

Programming languages and Software
Fortran, Matlab, Mathcad, Mathematica, CST, RSoft, COMSOL, Latex, Arduino software.

Lab Skills
Fabrication Lab (Fab Lab) Organizer, basics of Robotics, use of CNC, single photon detector SPCM (set up in progress).

Organization Experience
Seminar Organizer of the Telecommunication and Antenna group, Dept. of Electronics, University of Kent, UK (2007-2009).

Scholarships
Engineering and Physical Sciences Research Council (EPSRC) scholarship, (2005-2006) Queen Mary UK, (2006-2009) University of Kent UK.

Defence Science and Technology Laboratory (DSTL) scholarship, (2005-2006) Queen Mary University, UK.

Demokritos Funding (2003, four months) National Center for Scientific Research "Demokritos", Greece.

Awards
Honoris Causa, Naval Helicopter Base (BEN), Greece. (2015), Seaman First class Electronic Engineer.

Associations
Member of the Institute Of Physics (IOP).

Military Service
Seaman First class - Electronic Engineer, Naval Helicopter Base (BEN), Greece (2014-2015). Activity: Antenna design and fabrication, microcontroller programming and use of; sonars and wireless communication.

Activities
Deep sea sailing, orthophony, cooking, winemaker.

Publications

N.A. Giannakis, J.E. Inglesfield, A.K. Jastrzebski, and P.R. Young, *Photonic modes of a chain of nano-cylinders by the embedding method*. JOSA B, Vol. 30, No. 6, 1755, 2013.

J.M. Pitarke, J.E. Inglesfield, N. Giannakis, *Surface-plasmon polariton in a lattice of metal cylinders*. Phys. Rev. B **75**, 165415, 2007.

Conferences

N.A. Giannakis, J.E. Inglesfield, P.A. Belov, Y.Zhao, and Y.Hao, "Dispersion properties of subwavelength waveguide formed by silver nanorods," Photon06, September 4-7, 2006, Manchester, UK.