

Dionysios Xydias

Curriculum Vitae

PERSONAL INFORMATION

First name Dionysios
Last name Xydias
Date of birth 09.06.1986
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POSITION

PhD candidate University of Crete (UoC), Department of Materials Science and Technology & Foundation for Research and Technology Hellas, Institute of Electronic Structure and Laser (FORTH-IESL)
Lab Ultrafast Laser Micro and Nano Processing Laboratory

EDUCATION

10.2012 – 05.2016 **MSc Physics**, *Freie Universität Berlin*, Germany
GPA: 8.8/10.0.

09.2010 – 09.2011 **Automation Systems: Control and Robotics Systems**, *National Technical University of Athens*, Greece
Attended Masters level courses.

09.2005 – 11.2010 **BSc Physics**, *University of Crete*, Heraklion, Greece
GPA: 8.5/10.0. Entry rank: 1st, First Class Honours

09.1998 – 06.2004 **High School degree**, *Music high school of Pallini*, Athens, Greece
GPA: 19.2/20.0. Panhellenic Exams Score: 19372/20000

MASTER'S THESIS

Title **Electrical characterization of single GaAs based nanowires**

Supervisors Dr. Lutz Geelhaar, Dr. Ryan B. Lewis & Prof. Dr. Stephanie Reich

Description GaAs nanowires (NWs), 1D nanoscale semiconductors, grown and usually studied in ensembles, are amongst the most prominent candidates for future optoelectronic technologies. In this thesis, a process for the determination of the electrical properties of individual NWs was established. Single NWs were isolated and metallic contacts were fabricated to enable 4-point-probe electrical measurements, while an analytical model of the free carrier concentration distribution along the radius of a single core-shell NW was constructed. This model provided the basis for a self-consistent iterative data-analysis method, yielding the electrical properties of single MWs.

WORK EXPERIENCE

10.2017 - today *Ultrafast Laser Micro and Nano Processing Laboratory, FORTH-IESL, Greece*
Description I work on the determination of the topological effect of substrate topography on networks of neural cells, investigating how the electrical activity of networks of neural cell cultures, grown on pre-patterned substrates with regular, complex and random shapes, depends on the topography and the dimensional characteristics of the patterning as well as the growth conditions of the cell cultures. My methodology includes the design and preparation of substrates on which neural cells adhere and differentiate selectively, in predefined shapes, the recording of their electrical activity with the use of 2-photon excitation fluorescence microscopy and the analysis of the fluorescence signals to determine the correlation between individual neurons and the topology of the culture as a network. My main research interests focus on the combination of experimental imaging of live cell cultures and the use theoretical neuronal network model simulations of neuronal electrical activity for different network geometries to determine their effect on the network topology.

Lab experience - **Polarization-resolved Second Harmonic Generation (P-SHG)**
- **Multi-Photon Excitation Fluorescence Microscopy (MPEFM)**
- **Live Cell Imaging**
- **Calcium Imaging**
- **Neuronal network simulation and characterization**

10.2017 - today *Department of Materials Science and Technology, UoC, Crecece*
Teaching experience I worked as a **Teaching Assistant** for the courses of
- **Electromagnetism**
- **Solid state materials lab**

01.2013 - 05.2016 *Paul-Drude Institute für Festkörperelektronik, Berlin, Germany*
Description **Student Assistant**
As a personal project I developed a stable lithographic procedure for fabricating ohmic contacts on single NWs. Supportive work for various other projects in sample preparation, measurements and data analysis.

Lab experience - **Cleanroom:** Substrate preparation, spin-coating, lithography, plasma etching, metal deposition, Rapid Thermal Annealing, Molecular Beam Epitaxy.
- **Chemical room:** Preparation of solutions, chemical etching, handling of dangerous chemicals.
- **Microscopy:** Optical, Scanning Electron Microscopy, Atomic and Magnetic Force Microscopy.
- **Electrical measurements:** 4-point-probe resistivity, capacitance, magnetoresistance.

2004 - today *Private tutoring*
Teaching experience Teaching of physics and mathematics at high-school, undergraduate and graduate level.

CONFERENCES & EDUCATIONAL ACTIVITIES

- *The Hellenic Society for Neuroscience Meeting 2019*, 4-6 of October 2019, The Hellenic Society for Neuroscience, Heraklion, Greece.
- *NanoBio 2018: 1st International Conference on Nanotechnologies and Bionanoscience*, 24-28 of September 2018, IESL-FORTH & TEI of Crete, Heraklion, Greece.
Participation in the organization of the conference.
- *Dendrites 2018: Dendritic anatomy, molecules and function*, 17-20 of June 2018, European Molecular Biology Organization, Heraklion, Greece.
- *Second National Conference on Robotics*, 9-10 of December 2010, Technical Chamber of Greece, University of Patras, Greece.
- *Educational trip to CERN*, 10-15 of September 2006, Physics Department, UoC, Geneva, Switzerland.
- *8th Astrophysics summer school*, 6-10 of September 2003, National Observatory of Athens, Greece.

PUBLICATIONS

- Hüttenhofer, L., Xydias, D., Lewis, R.B., Rauwerdink, S., Tahraoui, A., Küpers, H., Geelhaar, L., Marquardt, O., and Ludwig, S. (2018). Optimization of Ohmic Contacts to n-Type GaAs Nanowires. *Physical Review Applied* 10.

AWARDS & HONOURS

- 2010 University of Crete Honour:** I recited the oath in the graduation ceremony, for being first of my class in the whole School of Mathematics and Natural Sciences, University of Crete, Greece.
- 2005 IKY (State Scholarships Foundation) award** for achieving 1st entry rank in the Physics Department, UoC, Greece.
- 2004 Eurobank award** for the highest GPA in the Music high school of Pallini.

SCHOLARSHIPS

- 2019 – 2022 ELIDEK project**
- 2018 Niarchos Foundation & IESL-FORTH**
- 2006 – 2009 IKY (State Scholarships Foundation) scholarship** for the highest grades in the Physics Department, University of Crete, Greece.

COMPUTER SKILLS

- **Operating systems:** Linux, Windows.
- **Programming languages:** Python, Matlab, Basic, Fortran.
- **Scientific programs:** OriginPro, Excel, Labview, LATEX, GeoGebra.

LANGUAGES

- **Greek** (Mothertongue)
- **English** (Fully proficient)
- **French** (Advanced)

INTERESTS

Guitar, percussion, singing Martial arts
Philosophy Cinema

REFERENCES

Scientific supervisors in Greece:

Dr. Emmanuel Stratakis *PhD supervisor*
General supervisor at FORTH

- *Research Director* of the Institute of Electronic Structure and Lasers, Foundation for Research and Technology Hellas.
- *Head* of the Ultrafast Laser Micro and Nano Processing Laboratory, IESL-FORTH.
- Department of Materials Science and Technology, University of Crete, Hellas.

Email: stratak@iesl.forth.gr

Prof. Anna Mitraki *PhD supervisor*

- *Chairperson* of the Department of Materials Science and Technology, University of Crete, Hellas.
- Institute of Electronic Structure and Lasers Foundation for Research and Technology Hellas.

Email: mitraki@materials.uoc.gr

Scientific supervisors in Germany:

Dr. Lutz Geelhaar *Master Thesis supervisor*
General supervisor at PDI

- Head of Nanofabrication group, Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany.

Email: geelhaar@pdi-berlin.de

Dr. Ryan B. Lewis *Master Thesis supervisor*

- Nanofabrication group, Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany.

Email: lewis@pdi-berlin.de