

Education

- 2016 PhD** in “Nanotechnology, Molecular electronics & Microelectronics” in the National Center for Scientific Research “Demokritos”, **Department of Nanoscience & Nanotechnology** in collaboration with the National Technical University of Athens, **Faculty of Chemical Engineering**.
THESIS: "Hybrid molecular solid state memories & electronic nanodevices based on Polyoxometalates" & other molecules of reversible redox activity" *SUPERVISOR: Dr. Nikos Glezos, NCSR Demokritos*
 Assoc. Prof. Mirtat Bouroushian, NTUA
- 2009 MSc** in “Material Science and Technology”, National Technical University of Athens, **Faculty of Chemical Engineering & Faculty of Mechanical and Mining Engineers**.
THESIS: "Co-relation of microstructure and magnetic properties in soft steels"
SUPERVISOR: Prof. Evangelos Hristoforou, NTUA
- 2007 National Technical University of Athens**,
 School of Applied Mathematical & Physical Sciences, Faculty of Physics. Majors:
 “Optoelectronics/Lasers” & “Material Physics”.
THESIS: "Alternative Silicon Technology: Adsorption of Cyclopentene (C₅H₈) molecules on Si(001) surfaces"
SUPERVISORS: Assist. Prof. Dimitra Papadimitriou, NTUA
Prof. Norbert Esser, TU Berlin

Fellowships, Research Experience & Professional Activities

- 2017-now: Early-stage post-doc researcher** in the Institute of Nanoscience & Nanotechnology, NCSR Demokritos, Athens-Greece (co-funded by the Greek ministry of finance & development and the EU for the “Growth of Materials and Devices with Applications in Industry, Health, Environment & Cultural heritage”).
- 11/2015-08/2016: Scientific consultant:** Dissemination services to the University of Macerata, Italy (secondment) in the frame of the EU project "GRAGE", Agreement No: 645706, as employee of Militos Consulting s.a.
- 2011-2016: PhD Researcher** in “Nanotechnology, Molecular electronics & Microelectronics” in the National Center of Scientific Research N.C.S.R. “Demokritos”, Athens and the NTUA
 (funding: exam-granted 4-year PhD scholarship & “NANOMOL”-Nanoelectronic Devices based on Molecular Materials program (E-11634) for “Development of Hybrid Nanodevices based on Polyoxometalate anions”)
- 2009-2010:** Self-employed (**Tutoring maths & physics** to postgraduate, undergraduate & secondary education students).
- 2009:** (Oct. & Nov.) **Visitor student** at I.E.S.L. FORTH “Cretan Matter Waves/Bose-Einstein Condensation” Group in Crete.
 ➔ **Design and (partial) construction** of a laser optical distribution system meant to be used for the realization of a Bose-Einstein Condensate utilizing ultra-cold Rb atoms (**Marie Curie Fellowship Program**).

2007-2008: Mechanical and Mining Engineers, NTUA: **Master thesis, Organization & conduction of the undergraduate Lab course** “Electronic Materials” of the faculty, **Involvement in project** related to the utilization of non-destructive testing for end-line TRIP steel products quality control.

2007-2008: Telecommunication Organization of Greece, **ADSL / Network Helpdesk.**

↳ **Front-end support** regarding internet connectivity problems of home and small business networks, set-up and parametrization of peripheral devices (routers, switches, etc.), application of network settings (TCP / IP), firewall and antivirus settings, management of background processes and applications in various operating systems (Windows, Mac), analysis of symptoms, verification of physical layer issues, as well as landline malfunction identification.

2005-2006: Institut für Festkörperphysik, TU Berlin, Germany (**diploma thesis** conduction).

2004-2005: Telecommunication Organization of Greece, **Department of Line Damage.**

↳ **Front-end support** regarding fixed telephony issues, terminals’ assembly and parameterization as well as landline o c h w p e v k q p ' k f g p w h e c v k q p 0 "

2004: Institute of Material Science (I.M.S.), National Center of Scientific Research N.C.S.R. “Demokritos”, Athens, **trainee.**

↳ Low Energy Electron Diffraction Spectroscopy and image analysis, Transmission Electron Spectroscopy and specimen preparation, problems on thermal diffusion.

2003: National Railway Organization of Greece, Department of Railway Lines’ Administration, **trainee.**

↳ Route/timetable database digitalization /organization using Microsoft excel database function.

Scholarships and Prizes

2011: Scholarship (exam-based) by the National Center for Scientific Research “Demokritos” & the Hellenic Ministry of Development–Research & Technology Network for elaboration of doctoral research in the field of “Hybrid molecular opto-electronic devices”.

2009: Scholarship for Performance of Excellence in the MSc studies of National Technical University of Athens “Material Science and Technology” (co-funded by Greek Ministry of Education and EU).

2007: Award of honor for "Best Diploma Thesis" of all NTUA departments for year 2007.

2005: Erasmus-Socrates NTUA – TU Berlin (1 year).

IT skills

Operating Systems: MS Windows (MS Office suite, etc.), Unix (Ubuntu)

Programming, S/W:

Pascal	Mathematica	LaTeX
C + +	Matlab	Communication Networks
HTML	Labview	Bash scripting basics

Languages

- Greek (mother tongue)
- English (full professional proficiency)
- German (Zertifikat Deutsch, level B.2.1.)

Conference Talks

CONF 1. March 2019: HYMA, Elsevier, 6th International Conference on Multifunctional, Hybrid and Nanomaterials, Sitges, Spain (A. Balliou, G. Papadimitropoulos, D. Skarlatos, N. Glezos, “[Functional molecular-nanostructured bulk metal oxide memory for nanoscale-nanosecond information storage](#)”)

CONF 2. July 2018: NANOARCH'18, 14th IEEE/ACM International Symposium on Nanoscale Architectures, Athens, Greece (A. Balliou, S. Kazim, J. Rakušan, J. Pfleger, G. Skoulatakis, S. Kennou, N. Glezos, “[Programmable molecular-nanoparticle multi-junction networks for logic operations](#)”)

CONF 3. Sept. 2017: MNE2017, 43rd international conference on micro- and nano-engineering, Braga Portugal, (A. Balliou, M. Bouroushian, A. M. Douvas, G. Skoulatakis, S. Kennou, N. Glezos, “[Electronically Agile Molecular Metal Oxide Hyperstructures for efficient memories and OPVs](#)”)

CONF 4. Sept. 2014: FSK30, 30th pan-hellenic conference on Solid-State Physics and Materials Science, Heraklion, Crete, Greece (a/ A. Balliou, G. Papadimitropoulos, N. Glezos, D. Davazoglou, “[Low temperature porous Ta₂O₅ films: Towards hybrid molecular/high-k oxides for non-volatile memory applications](#)”, b/ A. Balliou, N. Glezos, S. Kazim, J. Pfleger, J. Rakusan, S. Kennou, G. Skoulatakis, “[Hybrid networks based on the interplay of Au nano-particles and CuPcSu ligands](#)”)

CONF 5. July 2013: NN13, 10th international Conference on Nanosciences and Nanotechnologies, Thessaloniki, Greece (A. Balliou, S. Kazim, D. Velessiotis, N. Glezos, J. Rakušan, J. Pfleger, “[Formation of Au nano-particle networks with CuPcSu ligands- Electronic transport in mesoscopic scale](#)”)

CONF 6. Sept. 2012: MNE, 38th international conference on Micro & Nano Engineering, Toulouse, France (A. Balliou, D. Velessiotis, A. M. Douvas, P. Dimitrakis, P. Normand, P. Argitis, N. Glezos, “[Study of the transport mechanisms and charging effects in nanodevices based on inorganic polyoxometalate molecules](#)”)

CONF 7. June 2012: “Frontiers in electronic materials”, Nature Materials, Aachen, Germany (A. Balliou, A. M. Douvas, D. Velessiotis, V. Ioannou-Sougleridis, P. Normand, P. Argitis, and N. Glezos, “[Charging effects and electron transport phenomena associated with the red-ox properties of self-assembled polyoxometalate molecules](#)”)

CONF 8. May 2011: ICMAS, international Conference on Materials and Applications for Sensors and Transducers (A. Balliou, “[Correlation of Structural Characteristics of Low Carbon Ferritic Steel with Magnetic Properties](#)”)

Publications

- PUB 1. “Size-dependent single electron transfer and semi-metal-to-insulator transitions in molecular metal oxide electronics”, *A. Balliou, M. Bouroushian, A. M. Douvas, G. Skoulatakis, S. Kennou, and N. Glezos – Nanotechnology 29 (27), pp 275204 (2018);*
<http://dx.doi.org/10.1088/1361-6528/aabdc3>
- PUB 2. “Programmable Molecular-Nanoparticle Multi-junction Networks for Logic Operations”, *A. Balliou, J. Pflieger, G. Skoulatakis, S. Kazim, J. Rakusan, S. Kennou and N. Glezos – IEEE, ACM International Symposium on Nanoscale Architectures (NANOARCH-IEEE), (2018); doi>10.1145/3232195.3232225*
<https://ieeexplore.ieee.org/abstract/document/8604402>
- PUB 3. “Low Dimensional Polyoxometalate Molecules/Tantalum Oxide Hybrids for Non-Volatile Capacitive Memories”, *A. Balliou, G. Papadimitropoulos, G. Skoulatakis, S. Kennou, D. Davazoglou, S. Gardelis, and N. Glezos – ACS Appl. Mater. & Interfaces, 8 (11), pp 7212–7220 (2016);*
<http://dx.doi.org/10.1021/acsami.5b11204>
- PUB 4. “Probing the Localization of Charge and the Extent of Disorder through Electronic Transport on Au Nanoparticle/Copper Phthalocyanine Multi-Junction Networks”, *A. Balliou, S. Kazim, J. Pflieger, J. Rakušan, G. Skoulatakis, S. Kennou and N. Glezos – Phys. Status Solidi B, 1521-3951 (2016);*
<http://dx.doi.org/10.1002/pssb.201552547>
- PUB 5. “Tungsten polyoxometalate molecules as active nodes for dynamic carrier exchange in hybrid molecular/semiconductor capacitors”, *A. Balliou, A. M. Douvas, P. Normand, D. Tsikritzis, S. Kennou, P. Argitis and N. Glezos – Journal of Appl. Physics 116, 143703 (2014);* <http://dx.doi.org/10.1063/1.4897397>
- PUB 6. “Charging effects and electron transport phenomena associated with the red-ox properties of self-assembled polyoxometalate molecules.”, *A. Balliou, A. M. Douvas, D. Velessiotis, V. Ioannou-Sougleridis, P. Normand, P. Argitis, and N. Glezos – Low-Dimensional Transport and Ballistic Effects, Frontiers in Electronic Materials: Nature Conference (2013);*
<http://onlinelibrary.wiley.com/doi/10.1002/9783527667703.ch63/summary>
- PUB 7. “Mixed Molecular-Nanostructured Functional Metal Oxide Stacks for Nanoscale-Nanosecond Information Storage”, *A. Balliou, D. Skarlatos, G. Papadimitropoulos, N. Vouroutzis, N. Boukos and N. Glezos – submitted-under consideration*
- PUB 8. “Steel Health Monitoring Using Magnetic Techniques.”, *Vourna P, Ktena A, Mpalliou A, Mamalis AG, Hristoforou E – Materials Science Forum. Vol. 792. Trans Tech Publications (2014);*
<https://www.scientific.net/MSF.792.139>
- PUB 9. “Correlation of Structural Characteristics of Low Carbon Ferritic Steel with Magnetic Properties.”, *A. Mpalliou – Key Engineering Materials, Vol. 495. Trans Tech Publications (2012);*
<https://zh.scientific.net/KEM.495.213>

Projects

1/7/2016-31/8/2016: Dissemination-related research & activities as employee of Militos Consulting s.a. to the University of Macerata, Italy in the frame of the project “GRAGE”, Agreement No: 645706.

22/5/2012-22/5/2014: Research & scientific coordination activities in the frame of GREECE – CZECHIA bilateral cooperation project “NANOTRAP” for Innovative molecular electronic memory devices based on charge trapping in metal nanoparticle assemblies with adsorbed organic molecular linkers.

6/12/2012-6/12/2014: Participant in the GREEK-SLOVAK Bilateral Project “MOLFAB” for Molecular friendly processes for the fabrication of molecular electronic devices. 4/5

Service

Referee for: ACS Applied Materials & Interfaces, Journal of Physics D: Applied Physics

Organization of Workshops/Events

07/2016: Workshop on “*Creative Industries & Design as a Catalyst for Entrepreneurship & Innovation*”, Macerata, Italy, in the frame of dissemination activities for the EU project “GRAGE”.

Outreach

07/2018: Speaker at the 53^d Demokritos Summer School 2018 in Athens, Greece

TOPIC: “Working in sublithographic dimensions. Molecular assemblies for Nanoscale-Nanosecond Information Storage”

05/2017: Speaker at OPEN DAYS 2017: NCSR Demokritos Exploring Science, in the framework of “Europe in My Region 2017”

TOPIC: “Using Networks of Nanoparticles and Molecules to make Advanced Electronic Devices and Logic Gates”

08/2015: Speaker at the Hellenic Physical Society's Summer School 2015 in Aigina, Greece

TOPIC: “Living in the Nano-World”

Volunteering/Technical sports/training

2018: Open water Sailing Diploma, NOPF Nautathletic club of Palaio Faliro, Greece

2016-2017: Samaritans **First Aid and Rescue** School (15 months training, 100h practice in various hospital emergency departments, 150+h annual voluntary service)

2013: **First Aid** Red Cross seminar for citizens (20 h)

2013: **Rock Climbing** (Level A Rock Climbing Certificate by POA trekking club)

2011: Athletic and Scientific **Caving/Speleology** (Autonomous Caver Certificate by SELAS caving club)

Other Interests

Painting, travelling, reading, learning, apiculture & eusociality.