

## 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 (C<sub>5</sub>H<sub>8</sub>) 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 cñwpevkp'kf gpwñtecvkp0"

**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*

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**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*

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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*

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

## *Conference Talks*

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**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. Pflieger, 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 Ta<sub>2</sub>O<sub>5</sub> films: Towards hybrid molecular/high-k oxides for non-volatile memory applications](#)”, **b/** A. Balliou, N. Glezos, S. Kazim, J. Pflieger, 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. Pflieger, “[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-Souglideridis, 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:** ICMASST, 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

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**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

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**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

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

## Organization of Workshops/Events

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**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

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**07/2018:** *Speaker at the 53<sup>d</sup> 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

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**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

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