

CURRICULUM VITAE

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Standard academic and research record

ACCADEMIC BACKGROUND-EDUCATION

1981-1985 B.Sc. University of Ioannina, Ioannina, Greece (Physics)
1989-1990 Ms.Sc.: Institute of Materials Science, NCSR Demokritos Athens, Greece (*Molecular Physical Chemistry*).
1990-1994 Ph.D. Institute of Materials Science, NCSR Demokritos Athens, Greece
1994-1997 Post Doctoral Researcher (Individual Marie-Curie Fellowship) :Centre des Etudes Nucleaires SBE-CEA-Saclay France.
1997-1998 Post Doctoral Researcher (Marie-Curie Fellowship EU Return Grant) : Institute of Materials Science, NCSR Demokritos Athens, Greece
1999-2000 Senior Researcher :Universite Orsay-Saclay France.

ACADEMIS TRACK

2014- Professor Dept. Physics Univ. Ioannina, , Greece.
2012-2013 Visiting Professor Department of Mechanical and Process Engineering
ETH Zurich, Switzerland
2010-2014 Professor Dept. ENRM, Univ. Patras, Greece.
2006-2010 Associate Professor Dept. ENRM, University of Ioninna.
2000-2006 Assistant Professor Dept. of Environmental & Natural Resources Management [ENRM],
University of Ioninna, Greece.

ADMINISTRATIVE POSITIONS' TRACK

2020- *Director* MSc Program "Physics" Dept. Physics Univ. Ioannina
2017-2020 *Vice -Chair* Dept. Physics Univ. Ioannina, , Greece
2018-2020 *President* International Humic Substances Society (IHSS)
2016-2018 *Vice President* International Humic Substances Society (IHSS)
2016-2017 *Director* Section Solid State Physics & Surface Physics
Dept. of Physics, University of Ioannina
2015-2016 *Director* Section Solid State Physics & Surface Physics
Dept. of Physics, University of Ioannina
2014- *Head* Lab of Physical Chemistry of Materials & Environment
Dept. of Physics, University of Ioannina

ACADEMIC ACTIVITY

Supervisor of **21** PhD Theses (16 accomplished, 5 in progress)
Supervisor of **17** M.Sc. Theses (15 accomplished, 2 in progress)
Supervisor of **87** Diploma theses (86 accomplished, 1 in progress)

EDITORIAL-BOARD MEMBERSHIP IN SCIENTIFIC JOURNALS

[1] *Nanoenergy Advances* (MDPI) <https://www.mdpi.com/journal/nanoenergyadv/editors>
[2] *Nanomaterials* (MDPI) <https://www.mdpi.com/journal/nanomaterials/editors>
[3] *Energies* (MDPI) <https://www.mdpi.com/journal/energies/editors#editorialboard>

FOREIGN STAYS-VISITS

2012-2013- Particle Technology Laboratory ETH Zurich Dept of Mechanical and Process Engineering
2010-Institute of Physical and Theoretical Chemistry Center of Magnetic Resonance Goethe-University Frankfurt.
2009- Frumkin Inst. of Physical Chemistry, Russian Academy of Sci. Moscow Russia.
2007- Dept. of Chemistry Lomonosof University, Moscow Russia.
2003 -Section De Bioenergetique, Centre des Etudes Nucleaires, Saclay, France.
2002–Dept. of Chemistry University of Wrochlaw, Poland .
2001–Dept. of Physical Chemistry, Weissman Institute, Rehovot, Israel.

LAB OF PHYSICAL CHEMISTRY OF MATERIALS & ENVIRONMENT: RESEARCH INTERESTS AND ACTIVITY

www.nanomaterials.physics.uoi.gr

- **Industrial Level Development of Applied NanoMaterials for Energy & Environmental Technologies**
Our research aims to **bridge the gap** between lab-scale/academic research (TRL<4) and industrial-scale R&D (TRL>6) of nano-materials. Our strategy is to develop **High-Prerformance** functional nanostructuree using Flsme -Srrary-Pyrolysis (FSP) technology via precise control of the physics os nanolatices, photophysical properties and interfacial physical-chemistrty.
- **Artificial Photosytnehsis:** CO₂ conversion to green-fuels using solar power (photo-electrocatalysis). H₂ production from photocatalytic H₂O splitting using highghly-efficent nanocatalysts. <http://nanomaterials.physics.uoi.gr/index.php/nartphoto/> ;

Fuell Cell Nanomaterials: Oxygen Reducution Reaction (ORR) electrodes, Hyrogen Oxidation electrodes.

- **Plasmonic Photoactive Nanomaterials:** plasmonic-heating, plasmonic hot-electron phenomena, plasmonic catalysis
- **Nanosensrs:** *in-situ* development of nanofilms for anansensong of gases (H₂, CO₂, O₂, small organics)
- **Environmental Remediation Nanotechnology:** Heavy metal (Pd, Cd, Zn, Cu, Fe) depolution of waters with emphasis on High-Efficiency Arseninc Remedation, Cr⁶⁺-depolution, Lake-waters Amonia/Phosphate Anoxia abatment. Development of acive nananofilters for Microplastics, Nanotyreware remediation. Nanohybrids

Physics of Nanomaterials -Flame Spray Pyrolysis (FSP) technology.

<http://nanomaterials.physics.uoi.gr/index.php/2019/04/22/instalation-and-operation-of-scale-up-fsp-reactor/>

Single- and Double Nozzle FSP engineering of Semiconducting_ metal oxides, metal-oxide perovsikes or metallic nanomaterials and their heterostructures.

Reducing-Flame FSP engineering of suboxides oxides [magnelli phases Ti_mO_{2x-x}, Cu₂O, Cu⁰, Cu₂S, FeO, Fe₃O₄, Fe⁰, Ni⁰] and their heterostructures.

Industrial-Scale FSP: Scale up production of nanomaterials, Kg-per-hour-capacity.

Z-scheme phtoresponsive nanodevices. Superparamagnetic nanomaterials. Plasmonic phenomena, Hydrogen Atom Tranfer physics.

Safe-by-Design Production on Nanomaterials using FSP-technology: nantotoxicity control at the production-level (Mictotox, Reactive Oxygen Species, Metal-Leacing, Nano-size effects)

- **Development and applications of Advanced Electron Paramagnetic Resonance Spectroscopy.**

Spin Physics, Spin dynamics, spin lattice phenomena, Pulsed EPR spectroscopy, ESEEM, HYSCORE, study of interfacial phenomena, radical reactions, transient intermediates in (photo)catalytic cycles. High temperature EPR spectroscopy, Parallel Mode EPR on Integer Spins.

PATENT HOLDING

<u>PATENT Nr</u>	<u>TITLE of INVENTION</u>	<u>IPC</u>
EUROPEAN PATENTS		
https://register.epo.org/application?number=EP14761300/EP2842627		
<u>WO2015028529</u> <u>EP2842627</u>	VISIBLE LIGHT PHOTOACTIVE NANOPARTICLES AND METHODS FOR THE PREPARATION THEREOF	B01J35/02 C01G23/07 B01J21/06
<u>WO2014060080</u> <u>EP2722369</u>	HYBRID NANOANTIOXIDANT MATERIALS	C09C1/30
GREEK PATENTS		
https://www.obi.gr/obi/Default.aspx?tabid=124		
<u>1008854</u>	ΦΩΤΟΚΑΤΑΛΥΤΙΚΑ ΑΝΑΓΕΝΝΩΜΕΝΟ ΣΥΝΘΕΤΟ ΠΡΟΣΡΟΦΗΤΙΚΟ ΥΛΙΚΟ ΑΠΟ ΕΞΑΝΘΡΑΚΩΜΑ ΧΡΗΣΙΜΟΠΟΙΗΜΕΝΩΝ ΕΛΑΣΤΙΚΩΝ ΟΧΗΜΑΤΩΝ-N,F-TIO₂ ΓΙΑ ΤΗΝ ΡΟΦΗΣΗ-ΑΠΟΔΟΜΗΣΗ ΦΑΙΝΟΛΗΣ	C02F 1/28
<u>1008850</u>	ΥΛΙΚΟ ΑΠΟ ΕΞΑΝΘΡΑΚΩΜΑ ΑΝΑΚΥΚΛΩΜΕΝΩΝ ΕΛΑΣΤΙΚΩΝ ΟΧΗΜΑΤΩΝ ΒΕΛΤΙΣΤΟΠΟΙΗΜΕΝΟ ΓΙΑ ΛΕΣΜΕΥΣΗ ΑΡΣΕΝΙΚΟΥ	C09C 1/48
<u>1008352</u>	ΥΒΡΙΔΙΚΟ ΥΛΙΚΟ ΜΕ ΒΑΚΤΗΡΙΟΚΤΟΝΟ ΔΡΑΣΗ	C09C 1/30
<u>1007843</u>	ΠΡΟΣΡΟΦΗΤΙΚΟ ΥΛΙΚΟ ΓΙΑ ΤΗΝ ΑΠΟΜΑΚΡΥΝΣΗ ΦΩΣΦΟΡΟΥ ΚΑΙ ΑΜΜΩΝΙΑΣ	B01J 20/10

MEMBERSHIP IN INTERNATIONAL SCIENTIFIC ASSOCIATIONS

1] [2004-today] Member of the American Chemical Society

2] [1994-today] Member of the International EPR [ESR] Society

3] [2001-today] National Coordinator of the Greek branch of the International Humic Substance Society (IHSS)(<http://www.ihss.gatech.edu>.)

Funded Projects

- [2020-2023] “Engineering of High-Conduction Band (HCB) Nanophotocatalysts by Flame Spray Pyrolysis for Artificial-Photosynthesis **nARTPHOTO**” Grant funded by Hellenic Foundation for Research & Innovation (ΕΛΙΔΕΚ) (**Coordinator**)
- [2020-2021] “Engineering of Highly Reducing Nanophotocatalysts by Flame Spray Pyrolysis for H₂O splitting and CO₂ reduction” Grant funded by Hellenic General Secretary of Research and Technology (**Coordinator**)
- [2016-2017] “Production of C3S Concrete phase by Flame Spray Pyrolysis” Grant funded by TITAN S.A. (**Coordinator**)
- [2016-2017] “Reducing FSP production of Clored Nanomaterials” Grant funded by L OREAL (**Coordinator**)
- [2017-2018] “Production of Photoadsorbing Nanomaterials by Flame Spray Pyrolysis” Grant funded by L OREAL (**Coordinator**)
- [2016-2017] “Production of C3S Concrete phase by Flame Spray Pyrolysis” Grant funded by TITAN S.A. (**Coordinator**)
- [2016-2017] “Reducing FSP production of Clored Nanomaterials” Grant funded by L OREAL (**Coordinator**)
- [2016-2017] “Ceramic-Pyrolytic Carbon Composites” Grant funded by IKERAL S.A. (**Coordinator**)
- [2015-2016] “Controlled Optical Properties of Nanomaterials” Grant funded by L OREAL (**Coordinator**)

- [2012-2015] THALIS “Development of Hybrid Meso and Nanoporous Materials for Environmental and Catalytic Applications” (Coordinator)
- [2012-2015] SYNERGASIA “Development of Pyrolytic Carbon Materials for Environmental and Catalytic Applications”
- [2011-2012] “Development of low-Tg Glasses exploiting Red Mud wastes for Heavy Metal Remediation” Grant funded by ALUMINION S.A. (Coordinator)

LIST of (ISI) PUBLICATIONS (>210 publications/ h index >46/ citations >6000)

Indicative Recent Publications

<i>Highly Crystalline Nanosized NaTaO₃/NiO Heterojunctions Engineered by Double-Nozzle Flame Spray Pyrolysis for Solar-to-H₂ Conversion: Toward Industrial-Scale Synthesis</i>	Psathas, P., Moularas, C., Smykala, S., Deligiannakis, Y.*	2023	ACS Appl. Nano Materials 6, 4, 2658–2671 DOI 10.1021/acsnm.2c05066
<i>Electron Paramagnetic Resonance Quantifies Hot-Electron Transfer from Plasmonic Ag@SiO₂ to Cr⁶⁺/Cr⁵⁺/Cr³⁺</i>	Moularas, C., Dimitriou, C., Georgiou, Y., Boukos, N., Deligiannakis, Y.*	2023	Journal of Physical Chemistry C 127(4), pp. 2045-2057 DOI 10.1021/acs.jpcc.2c07837
<i>Nanoantioxidant Materials: Nanoengineering Inspired by Nature</i> REVIEW	Fragou, F., Theofanous, A., Deligiannakis, Y., Louloudi, M.*	2023	Micromachines 14(2),383 DOI 10.3390/mi14020383
<i>Control of monomeric Vo's versus Vo clusters in ZrO_{2-x} for solar-light H₂ production from H₂O at high-yield (millimoles gr⁻¹ h⁻¹)</i>	Deligiannakis, Y.* Mantzani, A., Zindrou, A., Smykala, S., Solakidou, M.	2022	Scientific Reports (Nature) 12(1),15132 DOI_10.1038/s41598-022-19382-3
<i>Reversible Plasmonic Switch in a Molecular Oxidation Catalysis Process</i>	Gemenetzi, A., Moularas, C., Belles, L., Deligiannakis, Y.* Louloudi, M.*	2022	ACS Catalysis 12(16), pp. 9908-9921 DOI_10.1021/acscatal.2c02287
<i>Safe-by-Design Flame Spray Pyrolysis of SiO₂ Nanostructures for Minimizing Acute Toxicity</i>	Fragou, F., Stathi, P., Deligiannakis, Y.* Louloudi, M.*	2022	ACS Applied Nano Materials 5(6), pp. 8184-8195 DOI_10.1021/acsnm.2c01273
<i>Double-nozzle flame spray pyrolysis as a potent technology to engineer noble metal-TiO₂ nanophotocatalysts for efficient H₂ production</i> REVIEW	Solakidou, M., Georgiou, Y., Deligiannakis, Y.*	2021	Energies 14(4),817 DOI 10.3390/en14040817
<i>A Hybrid Silk@Zirconium MOF Material as Highly Efficient As^{III}-sponge</i>	Georgiou, Y., Rapti, S., Mavrogiorgou, A., Louloudi, M., Deligiannakis, Y.*	2020	Scientific Reports (Nature) 10(1),9358 DOI_10.1038/s41598-020-66091-w
<i>Thermoplasmonic heat generation efficiency by nonmonodisperse core-Shell Ag⁰@SiO₂ Nanoparticle Ensemble</i>	Moularas, C., Georgiou, Y., Adamska, K., Deligiannakis, Y.*	2019	Journal Physical Chemistry C 123(36), pp. 22499-22510 DOI 10.1021/acs.jpcc.9b06532

FULL-LIST of Publications is accessible at

[https://www.scopus.com/results/results.uri?sid=880d8fa332f931b42e04c238809edbd2&src=s&sot=b&sdt=b&origin=searchbasic&tr=&sl=28&s=AUTHOR-NAME\(deliannakis%2Cy\)&searchterm1=deliannakis%2Cy&searchTerms=&connectors=&field1=AUTHOR_NAME&fields=](https://www.scopus.com/results/results.uri?sid=880d8fa332f931b42e04c238809edbd2&src=s&sot=b&sdt=b&origin=searchbasic&tr=&sl=28&s=AUTHOR-NAME(deliannakis%2Cy)&searchterm1=deliannakis%2Cy&searchTerms=&connectors=&field1=AUTHOR_NAME&fields=)