

# CURRICULUM VITAE

October 15, 2017

DR VASSILIOS BINAS

Postdoctoral Research Fellow  
Institute of Electronic Structure and Laser  
Foundation for Research and Technology - Hellas

Visiting Professor  
Department of Physics  
University of Crete

## PERSONAL INFORMATION

Gender: *Male*  
Nationality: Greek; Date of Birth: 20 March 1983  
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## Address

Foundation for Research and Technology - Hellas  
Institute of Electronic Structure and Laser  
Vassilika Vouton, 71110 Heraklion, Crete Greece

Lassaia 5,  
71305 Heraklion, Crete

## UNIVERSITY EDUCATION & DEGREES AWARDED

- 2010 **PhD in Inorganic Chemistry / Materials Science** School of Sciences and Engineering /Department of Chemistry, University of Crete, Greece,  
“*Novel nanoporous materials for adsorption and catalytic applications*”  
Supervisor: Prof. Pantelis Trikalitis
- 2007 **M.Sc. in Inorganic Chemistry**, School of Sciences and Engineering /Department of Chemistry, University of Crete, Greece,  
“*Novel mesostructured and mesoporous vanadium oxides for catalytic applications*”  
Supervisor: Prof. Pantelis Trikalitis
- 2005 **B.Sc. in Chemistry**, Department of Chemistry, University of Ioannina  
Diploma Thesis: “Catalytic behavior of Inorganic porous materials”, Degree Excellent (specialized in industrial chemistry)  
Supervisor: Prof. Phillipos Pomonis

## CURRENT POSITION

- 11/2016 – present, Foundation for Research and Technology/Institute of Electronic Structure and Laser, Greece,  
**Postdoctoral Research Fellow**
- 9/2016 – present, School of Sciences and Engineering /Department of Physics, University of Crete, Greece,  
**Visiting Professor**

## Career Since Graduation – Research Experience

- 11/2013 – 10/2016, School of Sciences and Engineering /Department of Physics, University of Crete, Crete Center for Quantum Complexity and Nanotechnology, Greece,  
**Research Fellow**
- 10/2014 – 12/2014, Institute of New Energy, Shenzhen, China,  
**Visiting Researcher**
- 8/2013 – 10/2013, Institute “Josef Stefan” / Electronic Ceramic –K5, Ljubliana, Slovenia,  
**Visiting Researcher**
- 1/2010 – 8/2013, Foundation for Research and Technology / Institute of Electronic Structure and Laser, Greece,  
**Postdoctoral Research Fellow**

## Selected FELLOWSHIPS / PRIZES / AWARDS *(more details in annex)*

- 2017 **One of the 20 selected young researchers from all over the world** participating in the International Forum "Forum for the Next Generation of Researchers" held at the European Parliament in Strasbourg and participating in VI World Materials Summit “Materials Innovation for the Global Circular Economy and Sustainable Society”.
- 2016 **3rd Award** in the Reach OUT! 2016 Competition that aims to engage the members of the European Materials Science who have designed, organized and implemented a public outreach activity in the EU with the title “*Nanotechnology to the School: Students Exploit Materials*”
- 2014 **Excellent Poster Award** for “Synthesis and Characterization of highly stable Fe-doped TiO<sub>2</sub> photocatalyst” in the Second International Conference of Young Researchers on Advanced Materials (IUMRS-ICYRAM 2014) was held in Haikou, Hainan, China
- 2014 **One of the 20 selected young researchers from all over the world** participating in the International Forum "Forum for the Next Generation of Researchers" held at the European Parliament in Strasbourg.
- 2013 **2nd Award in the Competition of Research & Innovation Industry**, with title “ECO Innovative Materials in the battle for antipollution”
- 2012 **3rd Award** for the Best Business Idea with title “Novel Materials for improve air quality” in the competition “Create your own Sustainable Business” organized by Greek German Chamber of Commerce and Industry.
- 2011 **One of the 10 best ideas** among 600 proposals from all over Greece in Competition of Applied Research & Innovation “Greece Innovates” organized by Hellenic Federation of Enterprises (SEV) and Eurobank EFG

## TEACHING EXPERIENCE

- 2014 – today School of Sciences and Engineering /Department of Physics, University of Crete  
Course: Electron Microscopy
- 20012 – 2014 School of Sciences and Engineering /Department of Physics, University of Crete, Tutor for Materials
- 2006 – 2010 School of Sciences and Engineering /Department of Chemistry, University of Crete Teaching Assistant, Lab courses for Inorganic Chemistry Lab I and II

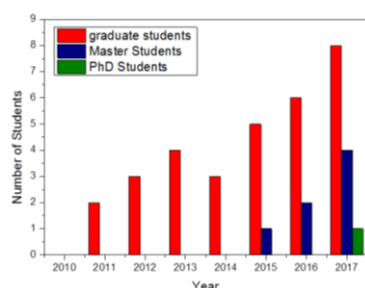
## Overview of Research Interests

My research activities are focused on the **development, synthesis and structural characterization of nanomaterials** along with the study of their physicochemical properties, for energy and environmental applications. In particular, I worked on metal oxides nanomaterials with different functionalities in powder and film form. These nanomaterials are of great technological importance in environmental, electronic and energy applications because of their capability to generate charge carriers when stimulated with required amount of energy. The promising arrangement of electronic structure, light absorption properties, and charge transport characteristics of most of the metal oxides has made them candidates especially for environmental and energy applications. I have a significant expertise on advanced materials synthesis using chemical (solution, sol-gel, solid state chemistry including hydrothermal, solvothermal, high temperature reactions, etc) or physical methods (Aerosol Spray Pyrolysis, Sputtering, etc), while I have strong experience on characterization techniques (Powder X-ray diffraction using conventional X-rays sources CuK $\alpha$ /Ag, Thermogravimetric Analysis-TGA, Differential thermal analysis-DTA, Differential Scanning Calorimetry-DSC, Mid and Far Infrared Spectroscopy-Reflectance and Transition mode, Raman and UV-Vis Spectroscopy, Scanning Electron Microscopy-SEM, Energy dispersive spectroscopy-EDS, High Resolution Transmission Electron Microscopy-HRTEM, Surface area measurements-BET, Kinetic on the degradations of gas and liquid pollutants, TOC Analyser, GC-MC, Gas analysers).

In particular for **environmental applications**, I targeted my research on **gas sensors** (to control the air quality and to detect toxic gasses) and on **photocatalytic nanomaterials** for improved air, water and health quality. On **energy applications**, I targeted my research on **thermochromic materials** for smart windows which are suitable for reduced energy consumption in Buildings.

## SUPERVISOR OF GRADUATE AND POST GRADUATE STUDENTS

Number of students, duration, and Host Institute shows in the follow table:



**Current:** 8 undergraduate research students  
4 Master (MSc) Students  
1 PhD Student

**Graduated:** 22 Undergraduate  
3 Masters

## Selected ORGANIZATION OF CONFERENCES, WORKSHOPS (more details in annex)

- 2018 **Organizer, Scientific Committee** of 13th PAINTS SYMPOSIUM on Research and Technology of Paints, Varnishes & Inks Building a lasting Future, Athens **Greece**
- 2016 **Co-Chair** of Organic Electronics Symposium, International Conference of Young Researchers on Advanced Materials, **India**
- 2015 **Co-Chair** of Symposium “Innovative Solution based coatings and flexible applications” EUROMAT, **Warsaw**

- 2015 **Organizer** of Training Workshop on Advanced Materials Characterization Techniques, Athens, **Greece**
- 2014 **Organizer** of TCM Bilateral meetings, 4<sup>th</sup> International Conference on Transparent Conductive Materials, Chania, **Greece**

**PUBLICATIONS** (more details in annex for: in press, accepted and submitted publications)

1. S. Murcia-López, M. Moschogiannaki, **V. Binas\***, T. Andreu, P-Y. Tang, J. Arbiol, J. Jacas, G. Kiriakidis, J.R. Morante “Insights into the Performance of (CoxNi1-x) Titanates as Photo- and Electro-Catalysts for Sun-Driven Water Oxidation” ACS Applied Materials & Interfaces, 9 (2017) 40290-40297.
2. E. Gagaoudakis, G. Michail, V. Kampylafka, K. Tsagaraki, E. Aperathitis, **V. Binas**, K. Morchovis, G. Kiriakidis, “Room temperature p-type NiO thin film based sensor for hydrogen and methane detection” Sensor Letter 15 (2017) 663–667
3. D. Katerinopoulou, K. Moschovis, E. Gagaoudakis, E. Aperathitis, **V. Binas** “A Comparable Study on ZnO-based room Temperature Ozone Sensing Characteristics Utilizing Conductometric and Surface Acoustic Waves Techniques” Madridge Journal of Nanotechnology & Nanoscience 2 (2017) 44
4. **V. Binas**, A. Philippidis, A. Zachopoulos, G. Kiriakidis “Highly selective adsorption capacity of cationic dyes in reversible solid state photocatalytic sponge like materials” Advanced Engineering Materials 18 (2017) DOI: 10.1002/adem.201600661
5. M. Gagaoudakis, E. Aperathitis, **V. Binas**, G. Kiriakidis, “Low temperature rf-sputtered thermochromic VO<sub>2</sub> films on flexible glass substrates” Advanced Materials Letter (2017) DOI: 10.5185/amlett.2016.6934
6. **V. Binas**, D. Venieri, D. Kotzias, G. Kiriakidis “ Modified TiO<sub>2</sub> based photocatalysts for improved air and health quality” Journal of Materiomics, 3 (2017) 3-16.
7. Danae Venieri, Fanourios Tournas, Iosifina Gounaki, **Vassilios Binas**, Apostolos Zachopoulos, George Kiriakidis, Dionissios Mantzavinos, “Inactivation of Staphylococcus aureus in water by means of solar photocatalysis using metal doped TiO<sub>2</sub> semiconductors” Journal of Chemical Technology & Biotechnology, 92 (2017) 43-51.
8. Danae Venieri, Iosifina Gounaki, Maria Bikouvaraki, **Vassilios Binas**, Apostolos Zachopoulos, George Kiriakidis, Dionissios Mantzavinos, “Solar photocatalysis as disinfection technique: inactivation of Klebsiella pneumoniae in sewage and investigation of changes in antibiotic resistance profile” Journal of Environmental Management, 195 (2017) 140 – 147
9. **Binas, V.**, Kortidis, I., Gagaoudakis, E., Moschovis, K., Kiriakidis, G., “Ageing resistant Indium Oxide ozone sensing films” Sensor Letters, 14 (2016) 563-566
10. Michail, G., Kambylafka, V., Tsagaraki, K., Adroulidaki, M., Kiriakidis, G., **Binas, V.**, Modreanu, M., Aperathitis, E., “On the growth of transparent conductive oxide ternary alloys Zn–Ir–O (ZIRO) by the means of rf magnetron co-sputtering” Thin Solid Films 617 (2016) 3–8
11. Gagaoudakis, E., Kortidis I., Michail, G., Tsagaraki, K., **Binas, V.**, Kiriakidis, G., Aperathitis, E., “Study of low temperature rf-sputtered Mg-doped vanadium dioxide thermochromic films deposited on low-emissivity substrates” Thin Solid Film 601 (2016) 99-105

12. Nkosi, S.S., **Binas, V.**, Ndwandwe, O.M., Kiriakidis, G., “On the connection between photo catalytic activities and magnetic properties of TiO<sub>2-x</sub> films” *Journal of Alloys and Compounds*, 654 (2016) 344-348
13. Venieri, D., Fraggadaki, A., **Binas, V.**, Zachopoulos, A., Kiriakidis, G., Mantzavinos, D., “Study of the generated genetic polymorphisms during the photocatalytic elimination of *Klebsiella pneumoniae* in water” *Photochemical and Photobiological Sciences* 14 (2015) 506-513
14. Venieri, D., Gounaki, I., Binas, V., Zachopoulos, A., Kiriakidis, G., Mantzavinos, D. “Inactivation of MS2 coliphage in sewage by solar photocatalysis using metal-doped TiO<sub>2</sub>” *Applied Catalysis B: Environmental* 178 (2015) 54-64
15. Venieri, D., Fraggadaki, A., Kostadima, M., Chatzisyneon, E., **Binas, V.**, Zachopoulos, A., Kiriakidis, G., Mantzavinos, D. “Solar light and metal-doped TiO<sub>2</sub> to eliminate water-transmitted bacterial pathogens: Photocatalyst characterization and disinfection performance” *Applied Catalysis B: Environmental*, 154-155 (2014) 93-101
16. Kalantzopoulos, G.N., Enotiadis, A., Maccallini, E., Antoniou, M., Dimos, K., Policicchio, A., Klontzas, E., Tylianakis, E., **Binas, V.**, Trikalitis, P.N., Agostino, R.G., Gournis, D., Froudakis, G. “Hydrogen storage in ordered and disordered phenylene-bridged mesoporous organosilicas” *International Journal of Hydrogen Energy*, 39, (2014) 2104-2114
17. Kiriakidis, G., **Binas, V.**, “Metal oxide semiconductors as visible light photocatalysts” 65 (2014) 297-302
18. Zacharakis, A., Chatzisyneon, E., **Binas, V.**, Frontistis, Z., Venieri, D., Mantzavinos, D., “Solar photocatalytic degradation of bisphenol a on immobilized ZnO or TiO<sub>2</sub>” *International Journal of Photoenergy*, (2013) Article ID 570587
19. Koutantou, V., Kostadima, M., Chatzisyneon, E., Frontistis, Z., **Binas, V.**, Venieri, D., Mantzavinos, D., “Solar photocatalytic decomposition of estrogens over immobilized zinc oxide” *Catalysis Today* 209 (2013) 66-73
20. **V.D. Binas**, K. Sambani, T. Maggos, A. Katsanaki, G. Kiriakidis, “Synthesis and photocatalytic activity of Mn-doped TiO<sub>2</sub> nanostructured powders under UV and visible light” *Applied Catalysis B: Environmental* 113– 114 (2012) 79– 86.
21. G. Kiriakidis, K. Moschovis, I. Kortidis, **V.D Binas**, “Ultra-low gas sensing utilizing metal oxide thin films” *Vacuum* 86 (2012) 495-506.
22. C. Cacho, O. Geiss, J. Barrero-Moreno, **V.D. Binas**, G. Kiriakidis, L. Botalico, D. Kotzias “Studies on photo-induced NO removal by Mn-doped TiO<sub>2</sub> under indoor-like illumination conditions” *Journal of Photochemistry and Photobiology A: Chemistry* 222 (2011) 304– 306

#### Keynote / SELECTED INVITED PRESENTATIONS *(more in annex)*

1. **Dr. V. Binas** “Functional Titania for improved Air and Health Quality” European Congress on Advanced Materials and Processes – EUROMAT, 17-22 September 2017, Thessaloniki, Greece | *Keynote*
2. **Dr. V. Binas** “Modified TiO<sub>2</sub> based photocatalysts for improved air and health quality” International Conference of Young Researchers on Advanced Materials, IUMRS-ICYRAM 2016, 11-15 December 2016, Bangalore, **India** / *Invited*

3. **Dr. V. Binas**, “Hydrogen Storage in high surface area materials: Amorphous graphene oxide and hybrid nanoporous oxides” SPIE Optics + Photonics for Sustainable Energy, Solar Hydrogen and Nanotechnology X, 9 – 13 August **2015, San Diego, USA** / *Invited*
4. **Dr. V. Binas**, “Indoor Air Quality improvement using nanomaterials as photocatalysts: from Lab to Real Environmental Applications” Berliner Chemie Symposium, April **2015, Berlin**/ *Invited*
5. **Dr. V. Binas**, “Metal Oxide Semiconductors as Visible Light Photocatalysts”, International Research Center for Renewable Energy, 6 November **2014, Xian, China**/ *Invited*
6. **Dr. V. Binas** “Towards a healthy indoor/outdoor environment: the role of visible light photocatalytic materials” 2nd International Conference of Young Researchers on Advanced Materials, IUMRS – ICYRAM Noveber **2014, Haikou, China**/ *Invited*
7. **Dr V. Binas** “Hybrid Nanostructures for Advanced Photocatalysts” Application of Printed, Organic & Flexible Electronics, **Printed Electronics Europe**, 17-18 April **2013/ Berlin, Germany**/ *Invited*
8. **Dr. V. Binas**, “UV Sensor by Inkjet Printing Technology” European Network on New Sensing Technologies for Air pollution Control and Environmental Sustainability – EuNetAir, December **2013, Cambridge, UK**/ *Invited*

#### **PATENTS**

- 2015 **Binas, V.**, “Method of production of photocatalytic powder comprising titanium dioxide and manganese dioxide active under ultraviolet and visible light” Patent Number: CN 102686311, Country: **China**
- 2011 **Binas, V.**, “Method of production of photocatalytic powder comprising titanium dioxide and manganese dioxide active under ultraviolet and visible light” Patent Number: PCT/EP2010/070872 European Patent Organization Country: **Europe**
- 2010 **Binas, V.**, “Photocatalytic powder composed of titanium dioxide and manganese dioxide active under infrared radiation and visible light” Patent Number: Greek Patent OBI No 1007062 Country: **Greece**

#### **COMMISSIONS OF TRUST**

- 2014 – today European Representative in the Global Materials Network on Advanced Materials
- 2013 – 2017 National Representative in the European Young Chemist Network

*Reviewer in 10 Scientific Journals (such as Journal of Chemical Technology and Biotechnology, Chemical Engineering Journal, Catalysis Today, Applied Catalysis B, Applied Physics A, 2D Materials etc)*

*Evaluator at the **General Secretariat for Research and Technology***

#### **Others activities (more details in annex)**

University Notes | Popularized Articles (Technical) | Reports in Press | Participation in Research Projects | Scientific Society Memberships