

CURRICULUM VITAE

Prof. DIMITRIS TSOUKALAS

ATHENS SEPTEMBER 2018

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Name: **DIMITRIS TSOUKALAS**

Prof. Address: National Technical University of Athens, Dept. of Appl. Sciences

Date and place of birth: 1956, Athens

1. EDUCATION

1979 : Diploma of Electrical and Mechanical Eng., National Technical Un. of Athens.

1980: Diplome DEA (Diplome d' Etudes Approfondies) in Electronics from ENSERG of Institut National Polytechnique de Grenoble (INPG).

1983 : Diplome de Docteur-Ingenieur from INPG

In November 1994 I received the '**Habilitation a Diriger des Recherches**' from INPG for my contribution in guiding new researchers towards a PhD in the area of process modeling and simulation.

2. PROFESSIONAL ACTIVITIES

2009 - today: Professor at School of Applied Mathematical and Physical Sciences, National Technical University of Athens

2009-2012: Director Institute of Microelectronics, NCSR Demokritos and Vice President (2011-2012) of NCSR Demokritos

2002-2009: Assoc. Professor, School of Applied Mathematical and Physical Sc., National Technical University of Athens. Director of the postgraduate Diploma on 'Microsystems and Nanodevices'.

1997 – 2002: Research Director (Grade A) at the Inst. of Microelectronics, NCSR 'Demokritos'.

December 1992 - 1997: Principal Researcher (Grade B') at the Inst. of Microelectronics, NCSR 'Demokritos'.

1989: Visiting Scientist at IBM Research Center at Yorktown Heights.

1988 - 1992 : Researcher in Charge (Grade C) at the Inst. of Microelectronics, NCSR 'Demokritos'.

1986 - 1988 : Researcher in the Dept. of Electronics in the Nuclear Research Center 'Demokritos'. During this period I participate in transferring MOS technology from the InterUniversity Center in Microelectronics (CIME) of Grenoble to 'Demokritos' through a bilateral cooperation.

1985 - 1986 : I have a contract with the Dept. of Electronics of Nuclear Res. Cent. 'Demokritos'. I participate to the design of the clean room facility as well as to the ordering of equipment.

3. ADMINISTRATIVE RESPONSIBILITIES

2017-: Member of Management Board NTUA Technology Park

2016- : Coordinating member in ‘Advanced Functional Materials’ Committee, General Secretariat of Research and Technology (GSRT)

2015- : Coordinator of Research and Postgraduate studies Committee at the School of Applied Math. & Phys. Sciences of NTUA.

2011-2012: Vice-President NCSR Demokritos

2009- 2012: Director IMEL, member of Management Board of NCSR Demokritos

2003-2009: Director postgraduate program ‘Microsystems and Nanodevices’ NTUA

2003-2008: Member of Management Board NTUA Technology Park

1998-2002: Deputy Director IMEL, NCSR Demokritos

4. RESEARCH INTERESTS AND ACTIVITIES

My research interests have initially focused on understanding and modeling of front-end silicon processing steps like diffusion, oxidation and implantation and the impact of process physics in predicting MOS device behavior in Silicon and Silicon-On-Insulator materials.

My interests have been later extended to include the use of nanotechnology in silicon processing for the development of new electronic devices focusing more particularly in memories using nanoparticles for charge storage elements formed either by silicon ion implantation in thin oxides and annealing, chemical self-assembly or sputtering. I have also initiated research in MEMS with emphasis in the use of wafer bonding for the development of micromechanical silicon based physical sensors and bio-chemical sensors.

Currently my research focus is on:

- Metal oxide thin films incorporating metallic or metal oxide nanoparticle assemblies with application in memristive devices for future crossbar non-volatile memories and neuromorphic circuits.
- -Intelligent surfaces through the realization of physical or bio-chemical nanoparticle based sensors and sensor arrays on flexible substrates.
- The use of ultrafast processing of semiconductors using laser beams.

I have published more than *150 papers in International journals* in the above areas which have received more than *2300 citations in ISI (h-index 25) and more than 2700 citations (h-index 27) in scopus*. From my work I hold 3 patents (2 international and 1 national).

- **Participation in research projects**

I was coordinator of 5 European projects (*STIMULATE, REGPOT-MiNaSys, Marie-Curie-NANOSOURCE, IST/FET-FRACTURE, ESPRIT-CASE*) and participant in other 7 (*ESPRIT-RAPID, IST-FRENDTECH, IST-PULLNANO, GROWTH-NEON, ESPRIT-MICROMEDES, HCM - NEWSSTAND, HCM-NEXUSTASK*)

I have also participated in 10 projects funded by GSRT or the Ministry of Education in Greece either as coordinator or partner. The above funding has brought more than 5 MEuros to my organizations) during the period 1993-today.

A list of projects is following.

List of Projects

List of International Projects

Title: Nanoparticle sensor arrays on flexible substrates (Lloyds Register Foundation)

Total Budget: 60 kEuros, NTUA budget: 60 kEuros

Start date: 1/10/ 2016, Duration: 36 months

Project Coordinator

Title: Stimulate Public Attitude towards Advanced Materials (STIMULATE, EU)

Total Budget: 1,300 kEuros, NTUA budget: 150 kEuros

Start date: 1/7/ 2013, Duration: 24 months

Project Coordinator

Title: Micro and Nanosystems Center of Excellence (MiNaSys: Regpot, EU)

Total Budget: 2000 kEuros, IMEL/Demokritos budget: 2000 kEuros

Start date: 1/12/ 2009, Duration: 36 months

Project Coordinator

Title: Metallic and semiconducting nanoparticles for source for electronic and optoelectronic applications'

(NANOSOURCE: Marie-Curie, EU)

Total Budget: 1132 kEuros, NTUA budget: 365 kEuros

Start date: 1/8/ 2008, Duration: 48 months

Project partner

Title: Radiation hardness in nanocrystal memories

(European Space Agency)

Total Budget: 150 kEuros, NTUA budget: 100 kEuros

Starting Date: 11/2009, Duration: 24 months

Project Coordinator

Title: Pulling the limits of NanoCMOS

(PULLNANO: Information Society Technologies- EU)

Total Budget: 25000 kEuros, NTUA budget: 150 kEuros

Start Date: 1/6/2006, Duration: 30 months

Project partner

Title: Integrated polymer-based micro fluidic micro system for DNA extraction, amplification, and silicon-based detection

(MICRO2DNA, Information Society Technologies, EU)

Total Budget: 3000 kEuros, NTUA budget: 60 kEuros

Starting Date: 2/2006, Duration: 36 months

Project partner

Title: Front-end technology simulation

(FRIENDTECH, Information Society Technologies, EU)

Total Budget: 2100 kEuros, IMEL/Demokritos budget: 360 kEuros

Starting Date: 7/2001, Duration: 36 months
Project partner

Title: Nanoelectronic devices and Fault-tolerant architectures
(FRACTURE, IST-Future and Emerging Technologies, EU)
Total Budget: 1600 kEuros, IMEL/Demokritos budget: 550 kEuros
Starting Date: 1/ 2001, Duration: 36 months
Project Coordinator

Title: Nanocrystals for Electronic Applications
(NEON, GROWTH-Materials, EU)
Total Budget: 2300 kEuros, IMEL/Demokritos Budget: 450 kEuros
Starting Date: 1/2001, Duration: 36 months
Project partner

Title: Redistribution and Activation Phenomena of dopants during Device Manufacturing
(RAPID, ESPRIT Long Term Research)
Total Budget : 1900 kECUs, IMEL Budget: 360 kECUs
Start date: 1/5/ 1997, Duration: 36 months
Partner

Title: Capacitive Silicon Sensors for Biomedical Applications
(CASE, ESPRIT-COPERNICUS)
Total Budget: 360 kECUs, IMEL Budget : 120 kECUs
Start date: 1/12/ 1996, Duration: 18 months
Project Coordinator

Title: Modular Microsystem for Controlled Medical Drug Release
(MICROMEDES, ESPRIT)
Total Budget: 3000 kECUs, IMEL Budget: 290 kECUs
Start date: 1/10/ 1993, Duration: 42 months

Title: NEXUSTASK (Human Capital & Mobility Network on Silicon Integrated Sensors)
Total Budget: 400 kECUs, IMEL Budget: 22 kECUs
Start date: 1/10/ 1993, Duration: 36 months

Title: NEWSSTAND (Human Capital & Mobility Network on Process and Device Simulation)
Total Budget: 155 kECUs, IMEL Budget: 13 kECUs
Start date: 1/10/1993, Duration: 36 months

List of National projects

Title: National Infrastructure in Advanced Materials, Nanotechnology and Nanoelectronics.
Total Budget: 4 MEuros, NTUA budget: 150 kEuros
Start date: 1/2/2018, Duration: 36 months
Project participant

Title: Research project IKY/Siemens
Total Budget: 47 kEuros, NTUA budget: 47 kEuros
Start date: 1/11/2015, Duration: 22 months
Project Coordinator

Title: Nanoparticles Assemblies for Resistive Memories (GSRT: ARISTEIA II)

Total Budget: 300 kEuros, NTUA budget: 250 kEuros
Start date: 18/2/2014/, Duration: 20 months
Project Coordinator

Title: Pesticides Monitoring Systems using Nanosensors for Safe Food Production
Total Budget: 350 kEuros, NTUA budget: 90 kEuros
Start date: 15/4/2012, Duration: 28 months
Scientific Coordinator

Title: Thin Film Silicon Photovoltaics (GSRT: SYNERGASIA)
Total Budget: 760 kEuros, NCSR Demokritos budget: 220 kEuros
Start date: 18/2/2011/, Duration: 36 months
Project Coordinator

Title: Nanoparticle chemical sensors (HERAKLEITOS, MINISTRY OF EDUCATION)
Total Budget: 45 kEuros, NTUA budget: 45 kEuros
Start date: 1/9/2010, Duration: 36 months
PhD fellowship to Mr. E. Skotadis under my supervision

Title: Laser annealing in silicon studied by experiments and simulation (HERAKLEITOS, MINISTRY OF EDUCATION)
Total Budget: 45 kEuros, NTUA budget: 45 kEuros
Start date: 1/6/2011, Duration: 36 months
PhD fellowship to Mr. S. Stathopoulos under my supervision

Title: Fabrication of nanoparticles and their application to charge storage (GSRT: Non-EU cooperation)
Total Budget: 60 kEuros, NTUA budget: 45 kEuros
Start date: 1/11/ 2006, Duration: 18 months
Project Coordinator

Title: Nanoelectronic Memory Devices, (PYTHAGORAS/MINISTRY OF EDUCATION)
Total Budget: 50 kEuros, NTUA budget: 50 kEuros
Start date: 1/8/ 2003, Duration: 36 months
Project Coordinator

Title: Diffusion and activation of dopants in Germanium (PENED/GSRT)
Total Budget: 130 kEuros, NTUA budget: 60 kEuros
Start date: 1/11/2005, Duration: 36 months
Project Coordinator

Title: Micromechanical sensors with application in food industry (PENED/GSRT)
Total Budget: 145 kEuros, NTUA budget: 60 kEuros
Start date: 1/11/2005, Duration: 36 months
Project partner

Title: Nanoparticles with application in low power electron devices and chemical sensors (Bilateral cooperation between Greece and UK)
Total Budget: 15 kEuros, NTUA budget: 15 kEuros
Start date: 1/8/ 2005, Duration: 24 months
Project Coordinator

Title: Nanocrystal memories (Empirikion Foundation)
Total Budget: 44 kEuros, NTUA budget: 44 kEuros
Start date: 1/8/ 2003, Duration: 24 months

Project Coordinator

Title: Silicon micromechanical humidity sensors
(GSRT)

Total budget: 55 M drachmas, IMEL Budget: 25 M drh.
Start date: 1/1/ 2000, Duration: 18 months

Title : Silicon micromechanical sensors using surface micromachining
(GSRT)

IMEL Budget : 10 M drh.
Start date: 1/6/ 1996, Duration: 24 months

Title: SOI structures by wafer bonding
(GSRT)

IMEL budget: 2 M drh.
Start date: 1/12/ 1993, Duration: 24 months

5. DEVELOPMENT ACTIVITIES

- As a Professor at NTUA (2002- today) I have contributed to the:
- design of a clean room laboratory equipped with thin film and nanoparticle deposition systems (sputtering and ALD) as well as to the electrical characterization laboratory establishment.
- material characterization lab operation where a FESEM (equipped with a Raith e-beam lithography), an XRD, an AFM and a mechanical profilometer are supporting various research activities in the Department and NTUA in general.
- As a Director of IMEL (2009-12) I have coordinated the submission and the successful execution of the EU funded project REGPOT that gave the opportunity of purchase and installation of an advanced e-beam system from VISTEC, the first in Greece that will be a key tool for future research and development activities. I have also proposed the renewal of clean room and equipment infrastructure within the framework of a 'Demokritos' proposal to GSRT.
- As a Researcher at 'Demokritos' I have contributed to the:
- design of the clean room facility and MOS technology establishment at IMEL (1985-1990).
- off-line micromechanical processing laboratory creation.
- As a Researcher at 'Demokritos' I have cooperated with an Israeli start-up company in the period 2002-05 in the field of MEMS. Our pressure sensor that made part of the system developed by Remon Medical company, was successfully implanted in humans to monitor blood pressure (Sinaia Hospital NY, 6/2003).

6. SCIENTIFIC COMMITTEES, INVITED TALKS, REVIEWING

- Editorial Board member in the journals: Microelectronic Engineering, Sensors (MDPI), European Physical Journal-Applied Physics
- Chairman ESSDERC/ESSCIRC (*European Solid State Device Research Conference/European Solid State Circuits Research Conference*) Athens 2009, and member of International Program Committee (1999- today)

- Chairman of *SISPAD '01* (Simulation of Semiconductor Devices and Processes IEEE Conference), Athens, Sept. 2001 and member of International Steering Committee 98-2004 and Program Committee, 98-2004 and 2016
- Member of Organizing Committee MRS Symposium on '*Materials and Processes for non-volatile memories*'
 - MRS Fall Meeting, Boston 2004
 - MRS Spring Meeting, San Francisco 2007
- Member of International Program Committee Eurosensors Conference (1997-2012)
- Member of International Program Committee of Transducers 2013, 2017
- Member of International Program Committee Micro and Nano Engineering International Conference (2002-today)

- I have given invited talks in International or National Conferences and Workshops (24) and Universities/Research Organizations (7) presented below.

Invited presentations at International Conferences and Workshops

1. 64th Vacuum Society Meeting 'Integration of Metallic Nanoparticles in Sensing and Memory Devices for Resistance Modulation and Enhanced Switching', Tampa, Florida, USA 29 Oct-3 Nov. 2017
2. 5th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (*IC4N*) 'Enhancing the switching properties of metal oxide resistive memories by nanoparticle incorporation', Porto Heli, Greece, June 2016
3. Workshop on Frontier in Electronics (WOFE) 'Understanding the formation of conductive filaments in RRAM through the design of experiments and simulations' San Juan, USA 15-18 Dec. 2015
4. 5th International Conference on Materials and Applications for Sensors and Transducers (IC-MAST) 'Nanoparticle sensors' Myconos 8-11 Sept. 2015
5. Intern. Semiconductor Device Research Symposium (ISDRS) 'Metal and metal oxide nanoparticles for emerging memories' 11-13 Dec. 2013 Bethesda, USA
6. National Solid State Physics and Materials Sc. Conference 'Nanoparticle assemblies and their applications' Athens, Sept. 2013
7. CIMTEC 2012 'Inorganic nanoparticles for either charge storage or memristance modulation' Montecatini Terme, 10-15 June 2012
8. Nano2012, 'Nanoparticles assemblies as biochemical sensors', Rhodes 26-31 August 2012
9. Nanotechnology 2011, 'Nanoparticles for chemical and physical sensing', Thessaloniki 12-14 July 2011
10. 9th International Symposium on Test and Measurement, 'Nanoparticle sensors' Suzhou, China, 4-7 August 2011
11. Univ. of Patras 'Research activities of IMEL', June 2010
12. Nanoparticles 2008, 'Memory effects in insulators incorporating semiconducting or metallic nanoparticles' Orlando, Florida, USA, May 2008
13. Smart Materials and Micro-Nanosystems, 'Nanoparticles for charge storage', Acireale, Sicily, June 2008
14. Gordon Research Conference/ Supramolecules and self-assembly, 'Charge storage in nanoparticles for memory applications' Il Ciocco, Italy, May 2007

15. AsiaNano 2006 'Electronic Memories based on organic thin films' Nov. 2006, Busan, Korea (together with M. Petty)
 16. First International Workshop on Semiconductor nanocrystals, SEMINANO 2005, 'Nanocrystals and their applications in nanocrystal memories' Budapest, August 2005
 17. E-MRS Symposium on Materials Science and Device Issues for Future Si-based Technologies, 'Recent advances in nanocrystal memories', Strasbourg June 2005
 18. Technical Un. Of Dresden 'Nanocrystals and their application in nonvolatile memories' October 2005
 19. EU Workshop on Research Training in Nanosciences and Nanotechnologies: Current Status and Future Needs, 'Postgraduate education in Nanotechnology at NTUA', Brussels, April 2004
 20. Hellenic Association of Physics, 'From microelectronics to nanoelectronics and nanotechnology' Loutraki, Greece, February 2004
 21. Technical Un. Of Warsaw on 'MEMS capacitive type devices obtained with wafer bonding', Warsaw, Feb. 2004
 22. 5th International Research Workshop on Future Information Processing Technologies organized by EU, SRC(USA), SELETE (Japan), 'Gold self-assembled nanoparticles for non-volatile memories', Miyazaki, Japan, 5-7 Nov. 2003
 23. NSF-EU Workshop on Nanomaterials and Nanotechnology, 'Nanoparticle Memories', Boston, US, December 2002
 24. Second International Research Workshop on Future Information Processing Technologies 'MOS nanocrystal memory', Vancouver, Canada, August 1999
 25. ST-Microelectronics 'Activities on Silicon On Insulator at IMEL' Tours, France , Jan. 1998
 26. '20th International Semiconductor Conference (CAS'97)', 'The influence of process physics on the short-channel behaviour of MOS devices. The example of the Reverse Short Channel Effect' Sinaia, Romania, Oct. 1997
 27. Second International Research Workshop on Future Information Processing Technologies 'Single-Electron Device Fabrication by extending current Silicon Technology', Sapporo, Japan, August 1997
 28. National Solid State Physics Association 'The continuing growth of microelectronics as a result of research industry collaboration', Athens June 1997
 29. Univ. Of Thrace, Dept. EE 'Silicon as the material for microelectronic and micromechanical devices', June 1997
 30. Dept. Of Physics, Univ. of Crete 'Simulation of silicon processing technologies', Dec. 1997
 31. Max-Planck Institut fuer Mikrostrukturphysik (Prof. U. Goesele) 'Application of the Wafer Bonding technique for process physics experiments and micromechanical sensors', Halle, May 1996
- I have been a reviewer for International Journals (*Nature Communications, Advanced Materials, Small, Nanoscale, Nature Scientific. Rep., ACS Mater. & Interf., ACS Langmuir, ACS J. Phys. Chem., J. Appl. Phys., Appl. Phys. Lett., IEEE Trans. Electr. Dev., IEEE Electron Dev. Lett., IEEE Trans. On Nanotechnology, Microelectronic Eng., J. Electrochem. Soc. Solid-St. Electronics, Semiconductor Sc. & Tech., J. Phys. D, Sens. & Actuat. A, Sens. & Act. B, Synthetic Metals, J. Vacuum & Technol. B*).

- I have been a reviewer for European and national funding organizations as well as prize organizations in Greece (Bodosakis Prize) and Japan ('Japan Prize' from Japan Prize Foundation annually from 2006).
- I am member of the Expert Evaluation Committee of the French Laboratory Institut d' Electronique de Microélectronique et de Nanotechnologie (CNRS-IEMN) in Lille, France (January 2019)

7. EDUCATIONAL ACTIVITIES

- I have established and I was the first Director of postgraduate diploma on 'Microsystems and Nanodevices' at NTUA with the participation of 5 Schools from NTUA and IMEL/NCSR Demokritos for the period 2002-2009. Within this diploma I use to teach a course on Micro and Nano sensors and a course on Nanoelectronic Devices.
- I have taught courses on Semiconductor Devices, Microsystems Technology and Electromagnetism for undergraduate students.
- I have supervised a total number of 30 diploma or postgraduate diploma thesis. Under my supervision 12 candidates have obtained their PhD and 4 others are currently preparing it.
- I have participated in numerous thesis examination committees in Greek Universities and abroad (Univ. Paul Sabatier Toulouse, Institut National Polytechnique de Grenoble, Ecole Polytechnique Paris, Univ. of Cambridge, Technical Un. of Dresden, University College Cork).

8. PUBLICATIONS

International Journal publications

1. L. Patsiouras, E. Skotadis, N. Gialama, C. Drivas, S. Kennou, K. Giannakopoulos, D. Tsoukalas 'Atomic layer deposited Al₂O₃ thin films as humidity barrier coatings for nanoparticle-based strain sensors' *Nanotechnology* 29 (2018)
2. I. Michelakaki, N. Boukos, D.A Dragatogiannis, S. Stathopoulos, C. Charitidis, D. Tsoukalas 'Synthesis of hafnium nanoparticles and hafnium nanoparticle films by gas condensation and energetic deposition' *Beilstein Journal of Nanotechnology* 9, 1868 (2018)
3. L. Madianos, G. Tsekenis, E. Skotadis, L. Patsiouras, D. Tsoukalas, 'A highly sensitive impedimetric aptasensor for the selective detection of acetamiprid and atrazine based on microwires formed by platinum nanoparticles' *Biosensors and Bioelectronics* 101, (2018)
4. E. Verrelli, I. Michelakaki, N. Boukos, G. Kyriakou, D. Tsoukalas, 'Coalescence of Cluster Beam Generated Sub-2 nm Bare Au Nanoparticles and Analysis of Au Film Growth Parameters' *Annalen der Physik* (2017)
5. P. Bousoulas, I. Michelakaki, E. Skotadis, M. Tsigkourakos, D. Tsoukalas, 'Low-Power Forming Free TiO_{2-x}/HfO_{2-y}/TiO_{2-x}-Trilayer RRAM Devices Exhibiting Synaptic Property Characteristics' *IEEE Transactions on Electron Devices* 64, (2017)
6. M. Tsigkourakos, P. Bousoulas, V. Aslanidis, E. Skotadis, D. Tsoukalas 'Ultra-Low Power Multilevel Switching with Enhanced Uniformity in Forming Free TiO_{2-x}-Based RRAM with Embedded Pt Nanocrystals' *Physica Status Solidi (a)* 214 (12) (2017)
7. P. Bousoulas, I. Giannopoulos, P. Asenov, I. Karageorgiou, D. Tsoukalas, 'Investigating the origins of high multilevel resistive switching in forming free Ti/TiO_{2-x}-based memory devices through experiments and simulations' *Journal of Applied Physics* 121, (2017)
8. M. Panagopoulou, D. Vernardou, E. Koudoumas, N. Katsarakis, D. Tsoukalas, Y.S. Raptis, 'Tunable properties of Mg-doped V₂O₅ thin films for energy applications: Li-ion batteries and electrochromics' *Journal of Physical Chemistry C* 121, (2017)
9. I. Michelakaki, P. Bousoulas, P., S. Stathopoulos, N. Boukos, D. Tsoukalas, 'Coexistence of bipolar and threshold resistive switching in TiO₂ based structure with embedded hafnium nanoparticles' *Journal of Physics D: Applied Physics* 50, (2017)
10. P. Bousoulas, I Karageorgiou, V. Aslanidis, K Giannakopoulos, D. Tsoukalas, 'Tuning Resistive, Capacitive, and Synaptic Properties of Forming Free

TiO₂-x-Based RRAM Devices by Embedded Pt and Ta Nanocrystals', *Physica Status Solidi (a)* 215 (3), 1700440

11. P. Bousoulas, P. Asenov, I. Karageorgiou, D. Sakellaropoulos, S. Stathopoulos, D. Tsoukalas, ' Engineering amorphous-crystalline interfaces in TiO₂-x/TiO₂-y-based bilayer structures for enhanced resistive switching and synaptic properties' *Journal of Applied Physics* 120, (2016)
12. M. Panagopoulou, E. Gagaoudakis, N. Boukos, E. Aperathitis, G. Kiriakidis, D. Tsoukalas, Y.S. Raptis, 'Thermochromic performance of Mg-doped VO₂ thin films on functional substrates for glazing applications' *Solar Energy Materials and Solar Cells* 157, (2016)
13. E. Skotadis, K.; Voutyras, M. Chatzipetrou, et al 'Label-free DNA biosensor based on resistance change of platinum nanoparticles assemblies', *Biosensors & Bioelectronics* 81, 388-394 (2016)
14. P. Bousoulas, S. Stathopoulos, D. Tsialoukis, D. Tsoukalas; 'Low-Power and Highly Uniform 3-b Multilevel Switching in Forming Free TiO₂-x-Based RRAM With Embedded Pt Nanocrystals', *IEEE Electron. Dev. Lett.* 37, 874 (2016).
15. H. Guo, J. Tang, K. Qian, et al 'Vectorial strain gauge method using single flexible orthogonal polydimethylsiloxane gratings', *Nature Sc. Reports* 6 23606 (2016)
16. Z. Hai, L. Gao, Q. Zhang, et al. 'Facile synthesis of core shell structured PANI-Co₃O₄ nanocomposites with superior electrochemical performance in supercapacitors', *Appl. Surf. Science* 361, 57 (2016)
17. J. Tang, H. Guo, M. Zhao, et al. 'Highly Stretchable Electrodes on Wrinkled Polydimethylsiloxane Substrates' *Nature Sc. Reports* 5, 16527 (2015)
18. M. Panagopoulou, E. Gagaoudakis, E. Aperathitis, et al. The effect of buffer layer on the thermochromic properties of undoped radio frequency sputtered VO₂ thin films, *Thin Solid Films* 594, 310 (2015)
19. J. Tang, H. Guo, M. Chen, et al. 'Wrinkled Ag nanostructured gratings towards single molecule detection by ultrahigh surface Raman scattering enhancement', *Sensors & Actuat. B-Chem* 218, 145 (2015)
20. S. Stathopoulos, L. Tsetseris, N. Pradhan, B. Colombeau, D. Tsoukalas 'Millisecond non-melt laser annealing of phosphorus implanted germanium: Influence of nitrogen co-doping', *J. Applied Phys.* 118, 135710 (2015)
21. P. Bousoulas, J. Giannopoulos, K. Giannakopoulos, et al. 'Memory programming of TiO₂-x films by Conductive Atomic Force Microscopy evidencing filamentary resistive switching', *Appl. Surf. Science* 332, 55 (2015)
22. P. Bousoulas, I. Michelakaki, D. Tsoukalas, 'Influence of Ti top electrode thickness on the resistive switching properties of forming free and self-rectified TiO₂ (-) (x) thin films', *Thin Solid Films* 571, 23- (2014)

23. J. Tang, H. Guo, P. An, et al. 'ZnO nanoparticles embedded in polyethylene-glycol (PEG) matrix as sensitive strain gauge elements', *J. Nanoparticle Res.* 16, 11 (2014)
24. N. Jabarullah, E. Verrelli, C. Mauldin, et al. Novel conducting polymer current limiting devices for low cost surge protection applications *J. Appl. Phys.* 116, 164501(2014)
25. P. Bousoulas, I. Michelakaki, D.Tsoukalas, ' Influence of Ti top electrode thickness on the resistive switching properties of forming free and self-rectified TiO₂-x thin films', *J. Appl. Phys.* 115, 034516 (2014)
26. S. Stathopoulos, A. Florakis, G. Tzortzis, D. Tsoukalas 'CO₂ Laser Annealing for USJ Formation in Silicon: Comparison of Simulation and Experiment' *IEEE Trans. Electron Dev.* 61, 696 (2014)
27. E. Verrelli, D. Tsoukalas, 'Cluster beam synthesis of metal and metal-oxide nanoparticles for emerging memories' *Solid-State Electronics* 101, 95 (2014) (*invited*)
28. I. Theodorakos, I. Zergioti, V. Vamvakas, et al., 'Picosecond and nanosecond laser annealing and simulation of amorphous silicon thin films for solar cell applications' *J. Applied Phys.* 115, 043108 (2014)
29. E. Skotadis, D. Mousadakos, K. Katsabrokou, D. Tsoukalas 'Flexible polyimide chemical sensors using platinum nanoparticles' *Sensors and Actuators B-Chemical* 189, 106 (2013)
30. E. Verrelli, D. Tsoukalas 'Investigation of the gate oxide leakage current of low temperature formed hafnium oxide films' *J. Appl. Phys.*, 113, 114103 (2013)
31. E. Verrelli, D. Tsoukalas P. Normand, et al. 'Forming-free resistive switching memories based on titanium-oxide nanoparticles fabricated at room temperature' *Appl. Phys. Lett.* 102, 022909 (2013)
32. P. Broutas; H. Contopanagos, D. Tsoukalas et al. 'A RF power harvester with integrated antenna capable of operating near ground planes' *Sensors and Actuators A-Physical* 186, 284 (2012)
33. J. Tang, E. Skotadis, S. Stathopoulos, E. Roussi, V. Tsouti, D. Tsoukalas 'PHEMA functionalization of gold nanoparticles for vapor sensing: Chemi-resistance, chemi-capacitance and chemi-impedance' *Sensors and Actuators B-Chemical* 170, 129 (2012)'
34. J. Tanner, D. Mousadakos, E. Skotadis, K. Giannakopoulos, D. Tsoukalas 'High strain sensitivity controlled by the surface density of Platinum nanoparticles' *Nanotechnology* 23 285501 (2012)

35. P. Broutas, H. Contopanagos, E.D. Kyriakis-Bitzaros, D. Tsoukalas, S. Chatzandroulis 'A low power RF harvester for a smart passive sensor tag with integrated antenna' *Sensors and Actuators A: Physical* 176, 34 (2012)
36. E. Verrelli, D. Tsoukalas 'Modeling of charge-trapping non-volatile-memories based on HfO₂' *Microelectronic Engineering* 90, 23 (2012)
37. M. Panagopoulou, N. Pantiskos, P. Photopoulos, J. Tang, D. Tsoukalas, Y. Raptis 'Raman enhancement of rhodamine absorbed on Ag nanoparticles self-assembled on nanowire-like arrays', *Nanoscale Research Letters* 6:629 (2011)
38. J. Tang, E. Verrelli, K. Giannakopoulos, D. Tsoukalas 'Electrostatic self-assembly of nanoparticles into ordered nanowire arrays' *J. Materials Research* 26 209 (2011)
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Proceedings Editor

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CITATIONS

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