

**2<sup>nd</sup> Research Team: “Smart Materials, Electrical Properties of Materials and Microelectronics”, Department of Materials Science and Physics Department, University of Patras.**

The main research interests of the 2<sup>nd</sup> research team are focused on the following topics: (1) Smart materials: Development and characterization of polymer matrix based smart materials, (2) Nanodielectrics, AC, DC and transient response, (3) Relaxation phenomena and conductivity in polymer and polymer composites, (4) Electrical response of porous materials, (5) Front-End processes in CMOS technology of semiconductors of the IV Group, (6) High-k dielectrics. Experimental facilities of the 2<sup>nd</sup> Research Team include: broadband dielectric spectroscopy, DC electrical measurements, piezometer system, thermal analysis (DSC, TGA, DMA), scanning electron microscopy, atomic force microscopy, atomic layer deposition system, etc.

<b>List of Research group's top 10 publications in journals</b>	<b>Citations*</b>
<b>1.</b> G. Ioannou, A. Patsidis, G. C. Psarras, “ <i>Dielectric and functional properties of polymer matrix/ZnO/BaTiO<sub>3</sub> hybrid composites</i> ”, <b>Composites Part A</b> , <b>42</b> , 104-110 (2011). <a href="http://www.sciencedirect.com/science/article/pii/S1359835X10002782">http://www.sciencedirect.com/science/article/pii/S1359835X10002782</a>	-
<b>2.</b> A. Kalini, K. G. Gatos, P. K. Karahaliou, S. N. Georga, C. A. Krontiras, G. C. Psarras, “ <i>Probing the dielectric response of polyurethane/alumina nanocomposites</i> ”, <b>Journal of Polymer Science: Part B: Polymer Physics</b> , <b>48</b> , 2346-2354 (2010). <a href="http://onlinelibrary.wiley.com/doi/10.1002/polb.22120/abstract;jsessionid=27DBAAF5C3932D9E6C7285C824B40872.d02t02">http://onlinelibrary.wiley.com/doi/10.1002/polb.22120/abstract;jsessionid=27DBAAF5C3932D9E6C7285C824B40872.d02t02</a>	-
<b>3.</b> Z. Spitalsky, G. Tsoukleri, D. Tasis, C. A. Krontiras, S. N. Georga, C. Galiotis, “ <i>High volume fraction carbon nanotube-epoxy composites</i> ”, <b>Nanotechnology</b> , <b>20(40)</b> , Art Num. 405702 (2009). <a href="http://iopscience.iop.org/0957-4484/20/40/405702/">http://iopscience.iop.org/0957-4484/20/40/405702/</a>	2
<b>4.</b> A. Patsidis, G. C. Psarras, “ <i>Dielectric behavior and functionality of polymer matrix-ceramic BaTiO<sub>3</sub> composites</i> ”, <b>Express Polymer Letters</b> , <b>2(10)</b> , 718-726 (2008). <a href="http://www.expresspolymlett.com/articles/EPL-0000736_article.pdf">http://www.expresspolymlett.com/articles/EPL-0000736_article.pdf</a>	10
<b>5.</b> G. A. Kontos, A. L. Soulintzis, P. K. Karahaliou, G. C. Psarras, S. N. Georga, C. A. Krontiras, M. N. Pisaniyas, “ <i>Electrical relaxation dynamics in TiO<sub>2</sub> - polymer matrix composites</i> ”, <b>Express Polymer Letters</b> , <b>1(12)</b> , 781-789 (2007) <a href="http://www.expresspolymlett.com/articles/EPL-0000414_article.pdf">http://www.expresspolymlett.com/articles/EPL-0000414_article.pdf</a>	7
<b>6.</b> K. G. Gatos, J. G. Martínez Alcázar, G. C. Psarras, J. Karger-Kocsis, “ <i>Polyurethane latex/water dispersible boehmite alumina nanocomposites: thermal, mechanical and dielectric properties</i> ”, <b>Composites Science and Technology</b> , <b>67(2)</b> , 157-167 (2007). <a href="http://www.sciencedirect.com/science/article/pii/S0266353806002776">http://www.sciencedirect.com/science/article/pii/S0266353806002776</a>	15
<b>7.</b> G. C. Psarras, “ <i>Hopping conductivity in polymer matrix – metal particles composites</i> ”, <b>Composites Part A</b> , <b>37(10)</b> , 1545-1553 (2006). <a href="http://www.sciencedirect.com/science/article/pii/S1359835X05004057">http://www.sciencedirect.com/science/article/pii/S1359835X05004057</a>	30
<b>8.</b> G. C. Psarras, E. Manolakaki, G. M. Tsangaris, “ <i>Dielectric dispersion and ac conductivity in-Iron particles loaded-polymer composites</i> ”, <b>Composites Part A</b> <b>34</b> , 1187-1198 (2003). <a href="http://www.sciencedirect.com/science/article/pii/S1359835X03002628">http://www.sciencedirect.com/science/article/pii/S1359835X03002628</a>	45
<b>9.</b> G. C. Psarras, E. Manolakaki, G. M. Tsangaris, “ <i>Electrical relaxations in polymeric particulate composites of epoxy resin and metal particles</i> ”, <b>Composites Part A</b> , <b>33</b> , 375-384 (2002). <a href="http://www.sciencedirect.com/science/article/pii/S1359835X01001178">http://www.sciencedirect.com/science/article/pii/S1359835X01001178</a>	66

**Short CVs of main and external researchers:**

**1. Georgios C. Psarras (team leader).** Webpage: <http://www.matersci.upatras.gr/en/Psarras>.

Dr Psarras is an Assistant Professor of the Department of Materials Science, University of Patras, Greece. He graduated from Physics Dep., University of Ioannina, Greece, and he holds a PhD in Physics Engineering from the Department of Materials Science & Engineering, School of Chemical Engineering, National Technical University of Athens, Greece. His research interests refer to: smart systems incorporating shape memory alloys or piezo/ferroelectric elements, electrical and thermomechanical properties of polymers and polymer composites, and nanodielectrics. His published work includes: 39 refereed papers, 65 full papers in proceedings of international or national conferences, 16 extended abstracts in proceedings of international conferences, 2 chapters in books, and 3 textbooks. He has been invited twice to give lectures to the “Summer School of Composite Materials” in the Institute for Composite Materials, Technical University of Kaiserslautern, Germany. He also gave the Key-Note Lecture in the “Smart Materials” session in the “International Conference on Structural Analysis of Advanced Materials”, September 2-6, 2007, Patras, Greece. His work has been cited more than 490 times (excluding self-citations, h-index 13). Dr Psarras is an active reviewer in 43 scientific journals, and member of the editorial board of three scientific journals. He had participated in 11 funded international or national research projects as coordinator or main researcher (Brite/EuRam, Energie, G-MATERIALS JRP-2 bilateral research project between Greece and Hungary,

IKYDA 2005 bilateral research project between Greece and Germany, PENED, EPET II etc.). He is also a member of University of Patras Internal Scientific Network "NANO-DEMA" (Nano-Devices and Materials) [<http://nanodema.upatras.gr>].

**2. Christoforos Krontiras (main researcher)** is a Professor of the Physics Department of the University of Patras, Greece. He graduated from the Physics Department., University of Patras, and he holds a PhD in Physics from the same Department and University. During his postgraduate studies he spent four years in the Semiconductor Laboratory of the Technical Research Centre of Finland (VTT) working on his PhD thesis with a scholarship from the Finish State. His main research interests refer to: Formation and characterization of Metal-Silicon thin films (Silicides), electrical properties of polymers and polymer composites, carbon nanotubes composites, porous materials (Silicon and Alumina) for microelectronic applications. He is also involved with the study of Front – End processes for group IV semiconductors CMOS applications, Formation and characterization of ultrathin gate dielectrics (oxides, oxynitrides, high- $k$  dielectrics formed by ALD) on Silicon, strained Silicon and Germanium substrates. His published work include: 45 refereed papers, 28 participations in international conferences and 25 in National conferences. Dr Krontiras is an active reviewer in 20 scientific journals. He had participated in 10 funded international or national research projects as coordinator or main researcher. He is a member of University of Patras Internal Scientific Network "NANO-DEMA" (Nano-Devices and Materials) [<http://nanodema.upatras.gr>] and of Scientific Society MICRO and NANO [<http://imel.demokritos.gr/micro-nano/home.html>].

**3. Stavroula N. Georga (main researcher)**. Dr Georga is an Associate Professor of the Physics Department of the University of Patras, Greece. She graduated from Physics Department, University of Athens, Greece, and she holds a PhD in Physics from the Department of Physics, University of Patras, Greece. Her main research interests refer to: Electrical properties of metals, semiconductors and insulators. Dielectric relaxations in micro/nanocomposites. Specifically: Electrical characterization of synthetic materials, carbon nanotubes composites, porous materials (Silicon and Alumina) for microelectronic applications, by DC and Transient electrical conductivity measurements, dielectric spectroscopy measurements. She is also involved with the study of Front – End processes for group IV semiconductors CMOS applications, Formation and characterization of ultrathin gate dielectrics (oxides, oxynitrides, high- $k$  materials formed by ALD) on Silicon, strained Silicon and Germanium substrates, study of dopant diffusion/activation and point-defected interactions for ultra-shallow junctions formation in Silicon and Germanium. Her published work include: 41 refereed papers, 26 participations in international conferences and 25 in National conferences. Her work has been cited more than 100 times. She is an active reviewer in 6 scientific journals. She had participated as main researcher in 5 funded national research projects. She is member of University of Patras Internal Scientific Network "NANO-DEMA" (Nano-Devices and Materials) [<http://nanodema.upatras.gr>] and of Scientific Society MICRO and NANO [<http://imel.demokritos.gr/micro-nano/home.html>].

**4. Violetta Gianneta (external researcher)** received her BSc in Physics (2002) and her MSc in environmental studies (2005) from the University of Patras. She conducted her PhD thesis in Microelectronics in the Institute of Microelectronics of NCSR "Demokritos" in collaboration with the Department of Physics of the University of Patras. In her PhD Thesis she worked in the development of porous anodic alumina (PAA,  $Al_2O_3$ ) membranes on Si substrates, nano-patterning of Si surface or thin  $SiO_2$  films on Si using porous anodic alumina mask and the electrical characterization of MOS capacitors (IV-CV-Cf) using PAA membranes and  $SiO_2$  dots as dielectric material. She worked as a postdoctoral researcher at the laboratory of Microelectronic and Composite Materials Research Group of Physics department. From the 10/2010 she joined the IMEL/NCSR "Demokritos" to work as a postdoctoral researcher working for the EU project FP7-ICT-NoE Nanofunction - Contract No 257375, in the field of formation and characterization of Si nano-wires and corresponding devices. She has published 8 papers and participated in 8 international and 2 national conferences.

**5. Vagelis Karoutsos (external researcher)**. Dr Karoutsos received his PhD in Physics from the Physics Department of Patras University, Greece) in 1999. In the years of 2000 to 2003, he was a postdoctoral fellow in Institute of Chemical Engineering and High Temperature process (ICEHT-FORTH), Patras, Greece. Since 2003 he has been working as a technical staff in Materials Science Department University of Patras Greece. At the same time he's been working part time as assistant professor in Technological Educational Institute of Patras (Department of Mechanical Engineering), teaching Physics. His research interest includes surface characterization and surface properties on thin films and multilayers using Atomic Force Microscopy and Magnetic Force Microscopy, laser micro/nanopatterning and nanostructures formation for photonic applications, thin films deposition with nanosecond UV Pulsed Laser Deposition technique. He is co-author in 20 refereed papers and he had participated in 12 international and national conferences.

**6. 1<sup>st</sup> and 2<sup>nd</sup> PhD student (external researchers):** PhD students will be chosen after an open call.