

Dr Evangelos Gogolides



Contact Information

Dr Evangelos Gogolides
Director of Research
P.O.Box 60228
153 10 Aghia Paraskevi
Athens - GREECE

Email: e.gogolides@inn.demokritos.gr

Tel: +30-2106503237
Fax: +30-2106511723

Short CV

Dr Evangelos Gogolides has a Diploma in Chemical Engineering *summa cum laude* from the National Technical University of Athens-Greece (1985), a MSc (1987) and a PhD in Chemical Engineering (1990) both from MIT-USA. His thesis work was on plasma processing and plasma process simulation. He did post doctoral research on microlithography with Michael Hatzakis at NCSR "Demokritos" (1991-1993). He was elected assistant professor of research at IMEL Demokritos in 1994, associate professor of research in 1998, and full professor (research director) in 2004. Dr Gogolides is an author of more than 210 publications and 10 patents, and coordinator of several research projects on Nanofabrication, Plasma Nanotechnology, and Nano(bio)technology.

His current research interests include micro and nano fabrication for Life Sciences, and Plasma Nanotechnology for improving bioanalytics and surface properties of materials. He was conference program-chair for Micro and Nano Engineering Conference MNE-1997, program and steering committee member of MNE, conference chair for the 34th MNE 2008, conference chair for iPlasmaNano 2016 conference, and member of the Technical Chamber of Greece. Dr Gogolides is editor in chief of [Microelectronic Engineering](#) (MEE), co-editor of the 30 year anniversary special issue of MEE [Micro and Nanofabrication Breakthroughs for Electronics, MEMS and Life Sciences](#), and member of the *Young Investigator Award* committee of MEE.

In 2013 the Plasma Nanotechnology group of NCSR Demokritos, co-directed by Dr Gogolides and Dr Tserepi, received the 2nd award in the Innovation Contest of the Hellenic Federation of Industries (SEV) and Eurobank. Dr Gogolides is a co-founder of two spin-off companies: [Nanoplasmas pc](#) and [Nanometrisis pc](#)

Research Interests

- **Plasma Nanoscience, Plasma Nanotechnology for "Smart" surfaces and devices** (plasma nanoassembly, and nanotexturing of polymers for wetting, biomolecule, cell attachment, and optical property control. Plasma etching, modification, plasma simulation (in Collaboration with Dr George Kokkoris), plasma-surface interactions, surface engineering)
- **Micro and Nano Fabrication for Chemistry and Life Sciences** (Incorporation of nanostructured surfaces in micro(nano)fluidics, bio-M(N)EMS and Lab-on-a-Chip for wetting control, antifouling, biomolecule and cell attachment. Microfluidics for cell capturing, and food safety. Microarrays, in collaboration with [Dr A. Tserepi](#), [Dr S. Kakabakos](#), and [Dr P. Petrou](#))

- **Micro and Nano Lithography, nanometrology, and simulation** (Lithographic processing, Line Edge, and contact Edge roughness, surface roughness characterization in collaboration with [Dr V. Constantoudis](#))

For details of research activities see

See Institute Programme [Plasma Enabled Nanofabrication](#)

And projects [PlasmaNanoFactory](#) , [Desiredrop](#), [LOVE FOOD](#)

Track Record in bullets

- 8 patents (each one includes Greek patent, European, USA and other country patents)
- 235 journal publications including 5 review papers, and 3 special issue editing
- 260 Conference presentations and publications in international conference proceedings, including 15 invited talks
- More than 40 presentations in Greek Conferences/proceedings since 2003, including 4 invited / best presentations)
- Total Citations during the period 1/1996-4/2015: 3146 ([h_index 28](#), Source Scopus)
- Total citations excluding all self-citations in the same period: 2334 ([h_index 24](#), Source Scopus).
- Total investment in equipment in the period 1999-2015: 700.000 Euro
- Total maintenance cost of the above equipment covered by the researcher 1999-2015: 700.000 Euro
- Total Research Income: 7 MEuro
- Total PhD thesis supervised / co-supervised: 17, Total MSc thesis supervised: 20
- Total of undergraduate thesis supervised: 15, Total of post-graduate schools organized: 5
- Co-founder 2 spin-off companies

Selected Representative publications.

In the field of Plasma Nanoscience and Plasma Nanotechnology

- [**Superamphiphobic Polymeric Surfaces Sustaining Ultrahigh Impact Pressures of Aqueous High- and Low-Surface-Tension Mixtures, Tested with Laser-Induced Forward Transfer of Drops**](#) Ellinas, K., Chatzipetrou, M., Zergioti, I., Tserepi, A., Gogolides, E.
2015, *Advanced Materials*, 27 (13), pp. 2231-2235
- [**Optical properties of high aspect ratio plasma etched silicon nanowires: Fabrication-induced variability dramatically reduces reflectance**](#)
- Smyrnakis, A., Almpanis, E., Constantoudis, V., Papanikolaou, N., Gogolides, E. 2015, *Nanotechnology*, 26 (8), 085301
- [**"Controlling roughness: From etching to nanotexturing and plasma-directed organization on organic and inorganic materials"**](#), Gogolides, E., Constantoudis, V., Kokkoris, G., Kontziampasis, D., Tsougeni, K., Boulousis, G., Vlachopoulou, M., Tserepi, A., (2011) *Journal of Physics D: Applied Physics*, 44 (17), art. no. 174021
- [**Mechanisms of oxygen plasma nanotexturing of organic polymer surfaces: From stable super hydrophilic to super hydrophobic surfaces**](#), Tsougeni, K., Vourdas, N., Tserepi, A., Gogolides, E., Cardinaud, C., (2009) *Langmuir*, 25 (19), pp. 11748-11759.
- [**Nanotextured super-hydrophobic transparent poly\(methyl methacrylate\) surfaces using high-density plasma processing**](#) Vourdas, N. , Tserepi, A., Gogolides, E. *Nanotechnology* 18(12) 2007, Article number 125304
- [**Si etching in high-density SF6 plasmas for microfabrication: Surface roughness formation**](#) Gogolides, E., Boukouras, C., Kokkoris, G., (...), Tserepi, A., Constantoudis, V. 2004, *Microelectronic Engineering* , 73-74, pp. 312-318

- [Etching of SiO₂ and Si in fluorocarbon plasmas: A detailed surface model accounting for etching and deposition](#) Evangelos Gogolides, Philippe Vauvert, George Kokkoris, Guy Turban and Andreas G. Boudouvis, *J. Appl. Phys.* 88, 5570 (2000)

In the field Micro and Nano Fabrication for Chemistry and LifeSciences

- [Hierarchical micro and nano structured, hydrophilic, superhydrophobic and superoleophobic surfaces incorporated in microfluidics, microarrays and lab on chip microsystems](#), Gogolides, E., Ellinas, K., Tserepi, A., 2015, *Microelectronic Engineering* 132, pp. 135-155 (Review Paper)
- ["High-capacity and high-intensity DNA microarray spots using oxygen-plasma nanotextured polystyrene slides"](#), Tsougeni, K., Koukouvinos, G., Petrou, P.S., Tserepi, A., Kakabakos, S.E., Gogolides, E., (2012) *Analytical and Bioanalytical Chemistry*, 403 (9), pp. 2757-2764.
- [Plasma Nanotextured PMMA Surfaces for Protein Arrays: Increased Protein Binding and Enhanced Detection Sensitivity](#), K. Tsougeni, A. Tserepi, V. Constantoudis and E. Gogolides, P. S. Petrou and S. E. Kakabakos, *Langmuir*, 2010, 26 (17), pp 13883–13891
- ["Smart" polymeric microfluidics fabricated by plasma processing: controlled wetting, capillary filling and hydrophobic valving](#), K. Tsougeni, D. Papageorgiou, A. Tserepi and E. Gogolides, *Lab Chip*, 2010, 10, 462-469
- [Plasma processing for polymeric microfluidics fabrication and surface modification: Effect of super-hydrophobic walls on electroosmotic flow](#), Vourdas, N., Tserepi, A., Boudouvis, A.G., Gogolides, E. (2008) *Microelectronic Engineering*, 85 (5-6), pp. 1124-1127

Micro and Nano Lithography, nanometrology, and simulation

- ["Contact edge roughness metrology in nanostructures: Frequency analysis and variations"](#), Vijaya-Kumar, M.K., Constantoudis, V., Gogolides, E., Pret, A.V., Gronheid, R., (2012) *Microelectronic Engineering*, 90, pp. 126-130.
- [A review of line edge roughness and surface nanotexture resulting from patterning processes](#), Gogolides E., Constantoudis V., Patsis G.P., Tserepi A., (2006) *Microelectronic Engineering*, 83 (4-9 SPEC. ISS.), pp. 1067-1072. (Review Paper)
- [Polyhedral oligomeric silsesquioxane \(POSS\) based resists: Material design challenges and lithographic evaluation at 157 nm](#), Tegou E., Bellas V., Gogolides E., Argitis P., Eon D., Cartry G., Cardinaud C. (2004) *Chemistry of Materials*, 16 (13), pp. 2567-2577
- [Quantification of line-edge roughness of photoresists. II. Scaling and fractal analysis and the best roughness descriptors](#), Constantoudis, V., Patsis, G.P., Tserepi, A., Gogolides, E. 2003 *Journal of Vacuum Science and Technology B: Microelectronics and Nanometer Structures* 21 (3), pp. 1019-1026.

[see complete list of publications of Dr Evangelos Gogolides](#)

Patents

- **Method for the fabrication of Periodic Structures on polymers using plasma processes**, Gogolides Evangelos, Tserepi Angeliki, Constantoudis Vassilios, Vourdas Nikolaos, Boulousis Georgios, Vlachopoulou Maria-Elena, Tsougeni Aikaterini, Kontziampasis Dimitrios, *Greek patent* Application number: 20080100404, *PCT* Application number: PCT/GR2009/000039, Publication number: WO/2009/150479
- **Method for making a microarray**, Tserepi Angeliki, Gogolides Evangelos, Kakabakos Sotirios, Petrou Panagiota, Bayiati Pinelopi, Matrozos Evrimahos, *Greek patent* Application number: 20070100394, EP 08762641.2 / *PCT* Application number: PCT/GR2008/000048, Publication number: WO/2008/155585

- **Method for the fabrication of high surface area ratio and high aspect ratio surfaces on substrates**, Tserepi Angeliki, Gogolidis Evangelos, Misiakos Konstantinos, Vlachopoulou Maria-Elena, Vourdas Nicolaos, *Greek patent* Application number: 20050100473, *PCT* Application number: PCT/GR2006/000011 Publication number: WO2007031799, Application number: WO2006GR00011 20060308
- **Molecular resists based on functionalized polycarbocycles** Argitis Panagiotis, Gogolides Evangelos, Couladouros Elias, Niakoula Dimitra, Vidali Veroniki, Gautam Daman R., *Greek patent* Application number: 20050100472, *PCT* Application number: PCT/GR06/000050 Publication number: WO2007031803
- **Lithographic materials based on polymers containing polyhedral oligomeric silsesquioxanes**, Gogolides Evangelos, Argitis Panagiotis, Bellas Vasilios, Tegou Evangelia, *Greek patent* Application number: 20020100253, *PCT* Application number: PCT/GR03/00018, Publication number: WO03102695, Publication number: EP1552346
- **Polycarbocyclic derivatives for modification of resist, optical and etch resistance properties**, Gogolides Evangelos, Argitis Panagiotis, Couladouros Elias, Vidali Veroniki, Vasilopoulou Maria, Cordoyiannis George, *Greek patent* Application number: 20010100506, *PCT* Application number: PCT/EP02/12284, Publication number: EP1444550, *US Patent Office* Application number: 20050026068
- **Silylation of epoxy-containing photoresist films** Gogolides Evangelos, Tegou Evangelia, Argitis Panagiotis, Hatzakis Michael *US patent number*: 6,296,989 B1
- **Microlithographic materials and processes based on poly (hydroxyalkyl acrylates)** Argitis Panagiotis, Vasilopoulou Maria, Gogolides Evangelos, Tegou Evangelia, Raptis Ioannis, *Greek patent* Greek patent number: 1003420

Organization of International Conferences / Schools

- MNE Micro and Nano Engineering 1997 (Programme Chair), MNE 2008 (Conference Chair), Member of the Steering and the Programme Committee of MNE,
- Member of the Programme Committees of EIPBN (Electron Ion and Photon Beam Conference and Nanofabrication), MNC (Micro and Nano Conference, Japan), ISNM (International Symposium on Nanomanufacturing), IEEE MEMS, Micro & Nano Conference-Greece, IC4N conference
- International post-graduate summer school and practical training **Methods in Micro – Nano Technology and Nano-bio Technology**. Official School of the Nano2life Network. See web pages <http://imel.demokritos.gr/SummerSchool2009/index.htm> (similar web page for 2010, 2008,7,6)
- View videos: <http://video.tau.ac.il/Lectures/nano/Nano2Life/>

For details of research activities see

See Institute Programme [Plasma Enabled Nanofabrication](#)

And projects [PlasmaNanoFactory](#) , [Desiredrop](#) , [LOVE FOOD](#)

Videos Describing the research of Dr Gogolides and Colaborating Researchers

In English:

<https://www.youtube.com/watch?v=MD29cU4hhHU>

In Greek:

<https://www.youtube.com/watch?v=1lkywk14L80&feature=youtu.be>