

**PERSONAL INFORMATION**

Lucel Sirghi



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Sex M | Nationality Romanian

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September 2025-present

**Professor Emeritus**

Department of Physics, Alexandru Ioan Cuza University

**WORK EXPERIENCE**

October 2014-September 2025

**Professor**

Department of Physics, Alexandru Ioan Cuza University

*Didactic:* lectures of plasma physics, plasma diagnosis and structural analysis of biological matter

*Research:* plasma assisted thin film deposition with application in environment, energy, and medicine, plasma surface functionalization, atomic force microscopy investigation of surface forces (friction and adhesive forces) for oxides, polymers and biologic samples

October 1990-October 2014

**Business or sector** Education

**Associate Professor/Lecturer/Teaching Assistant**

Department of Physics, Alexandru Ioan Cuza University

*Didactic:* lectures, didactical experiments and seminars of plasma physics, plasma diagnosis, numerical and analogical modeling of biological processes, structural analysis of biological matter

*Research:* plasma assisted thin film deposition and surface characterization, plasma functionalization and cleaning, and atomic force microscopy investigation of surface forces (friction and adhesive forces) for oxides, polymers and biologic samples

September 1983-October 1990

**Business or sector** Education

**School Teacher**

School no. 2, Suceava, Romania

*Didactic:* teach basic knowledge of physics;

**Business or sector** Education

EDUCATION AND TRAINING
 

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February, 1992 - December, 1997	<p>Ph. D.</p> <p>Department of Physics, Alexandru Ioan Cuza University, Blvd. Carol I 11, IASI 700509, Romania</p> <p>Physics (study of ionization instability in collisional plasmas)</p>
April, 1995 - March, 1997	<p>M. Eng.</p> <p>Department of Electrical Engineering, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, 446-8555 Japan</p> <p>System Engineering (study of nonlocal electron kinetics in collisional plasmas)</p>
September, 1970 - June, 1983	<p>BS</p> <p>Department of Physics, Alexandru Ioan Cuza University, Blvd. Carol I 11, IASI 700509, Romania</p> <p>Physics (solid state physics)</p>

 ADDITIONAL INFORMATION
 

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**Grants** **CNCSIS grant type RO-FR 18/06.01.2014** *SNON –oxynitrides for solar energy*  
**CNCSIS, IDEI PNII 267/05.10.2011** *Plasma functionalization of nanoscopic probes.*  
**Grant FP7 nr 224982/2008** *FUSINET–A European Fusion Education Network*, local manager  
**CNCSIS grant type A 628/2004** *AFM study of interaction forces between functionalized surfaces*

**Peer Review Scientific Papers** **81** ISI papers  
**Citations** **1844** citations  
**h-index** **24**

**Scholarships and Awards** **Visiting Professor (aprilie-iunie 2014)**  
*-proiectul de cercetare:* Colloidal lithography used in plasma assisted thin film depositions.  
*-institutia:* Research Institute of Electronics, Shizuoka University 3-5-1 Johoku, Hamamatsu-shi, 432-8011 JAPAN

**Senior Scientist Fellowship/Contractual Agent (iunie 2005-noiembrie 2008)**  
*-proiectul de cercetare:* Biodecon, CellNanoTox (granturi FP6 ale Comisiei Europene).  
*-institutia:* Institute for Health and Consumer Protection, European Commission Joint Research Centre, via E. Fermi no. 1, 20201 VA, Italy

**Fulbright Scholar (septembrie 2004 - martie 2005)**  
*-proiectul de cercetare:* Studiul cu ajutorul microscopiei cu forta atomic a fortelor de interactiune dintre suprafete chimic functionalizate.  
*-institutia:* School of Physics, Georgia Institute of Technology, Atlanta

**NATO-CNR Scholar (iunie 2004 - august 2004)**  
*-proiectul de cercetare:* Studiul cu ajutorul microscopiei cu forta atomic a fortelor de adeziune si frecare.  
*-institutia:* Istituto di Struttura della Materia, CNR, Via Fosso del Cavalerie 101.1-00133, Roma, Italy.

## Scholarships and Awards

**Shizuoka University Visiting Scientist (august 2000 – martie 2003)**

-*project*: depunerea asistata de plasma si caracterizarea filmelor fotocatalitice de TiO<sub>2</sub>  
 -*institution*: Research Institute of Electronics, Shizuoka University 3-5-1 Johoku, Hamamatsu-shi, 432-8011 JAPAN

**Nagoya University Visiting Researcher (octombrie 1999 – iulie 2000)**

-*projectul de cercetare*: Masuratori de forte de suprafata cu ajutorul microscopiei cu forta atomica in proiectul "Biomimetic Material Processing" finantat de Societatea Japoneza de Promovare a Stiintei.  
 -*institutia*: Graduate School of Engineering, Nagoya University, Chikusa, Nagoya 464-8603, Japan

**SELECTED PUBLICATIONS**

- 1) Gabriela Tifui, Marius, Dobormir, Lucel Sirghi, Stiffening of polydimethylsiloxane surface as result of exposure to low-pressure argon discharge plasma, *Plasma processes and Polymers* 20, DOI10.1002/ppap.202300014.
- 2) Alexandra Besleaga, Aurelia Apetrei and L. Sirghi, Atomic force spectroscopy with magainin 1 functionalized tips and biomimetic supported lipid membranes, *Eur. Biophys. J.* 2022, <https://doi.org/10.1007/s00249-021-01580-y>.
- 3) Dascalu Adina; Pohoata Valentin; Shimizu K; Sirghi, Lucel, Molecular Species Generated by Surface Dielectric Barrier Discharge Micro-plasma in Small Chambers Enclosing Atmospheric Air and Water Samples, *PLASMA CHEMISTRY AND PLASMA PROCESSING*(2020) 28, 25, -255302.
- 4) Besleaga, A., Demeter, A., Rusu, G. B., Dinca, P., Sirghi., L. PHOTOCATALYTIC ACTIVITY OF TiO<sub>2</sub> FILMS, DEPOSITED BY REACTIVE MULTI-PULSE HiPIMS AT DIFFERENT SUBSTRATE TEMPERATURE VALUES *Rom Rep Phys.* 71, 2019, 505.
- 5) Samoila, F; Pohoata, V; Sirghi, L, Cleaning Away the Oleic Acid Contaminant from Glass Surface by Negative Glow Plasma, *PLASMA CHEMISTRY AND PLASMA PROCESSING* 38(6) 2018, 1273-1291.Q1
- 6) Demeter, A; Tiron, V; Sirghi, L, TiO<sub>2</sub> 2D NANOPATTERNS OBTAINED BY HIGH POWER IMPULSE MAGNETRON SPUTTERING DEPOSITIONS WITH COLLOIDAL MASKS, *ROMANIAN REPORTS IN PHYSICS* 70(4) 2018, -515.
- 7) Tiron, V; Velicu, IL; Stanescu, D; Magnan, H; Sirghi, L, High visible light photocatalytic activity of nitrogen-doped ZnO thin films deposited by HiPIMS, *SURFACE & COATINGS TECHNOLOGY* 324() 2017, 594-600. Q1
- 8) Demeter, A; Samoila, F; Tiron, V; Stanescu, D; Magnan, H; Straticiu, M; Burducea, I; Sirghi, L, Visible-light photocatalytic activity of TiO<sub>x</sub>N<sub>y</sub> thin films obtained by reactive multi-pulse High Power Impulse Magnetron Sputtering, *SURFACE & COATINGS TECHNOLOGY* 324() 2017, 614-619.
- 9) Rudolph, M; Demeter, A; Foy, E; Tiron, V; Sirghi, L; Minea, T; Bouchet-Fabre, B; Hugon, MC, Improving the degree of crystallinity of magnetron-sputtered Ta<sub>3</sub>N<sub>5</sub> thin films by augmenting the ion flux onto the substrate, *THIN SOLID FILMS* 636() 2017, 48-53.
- 10) Demeter, A; Tiron, V; Lupu, N; Stoian, G; Sirghi, L, Plasma sputtering depositions with colloidal masks for fabrication of nanostructured surfaces with enhanced photocatalytic activity, *NANOTECHNOLOGY* 28(25) 2017, -255302.
- 11) Samoila, F; Besleaga, A; Sirghi, L, Atomic Force Microscopy Study of Contamination Process of Glass Surface Exposed to Oleic Acid Vapors, *RECENT GLOBAL RESEARCH AND EDUCATION: TECHNOLOGICAL CHALLENGES* 519() 2017, 71-74.
- 12) Demeter, A; Besleaga, A; Tiron, V; Sirghi, L, Fabrication of 2D TiO<sub>2</sub> Nanopatterns by Plasma Colloidal Lithography, *RECENT GLOBAL RESEARCH AND EDUCATION: TECHNOLOGICAL CHALLENGES* 519() 2017, 117-122.
- 13) Sirghi, L; Samoila, F; Anita, V, Cleaning of Silica Surfaces by Surface Dielectric Barrier Discharge Plasma, *RECENT GLOBAL RESEARCH AND EDUCATION: TECHNOLOGICAL CHALLENGES* 519() 2017, 255-259.
- 14) Sirghi, L, Plasma synthesis of photocatalytic TiO<sub>x</sub> thin films, *PLASMA SOURCES SCIENCE & TECHNOLOGY* 25(3) 2016, -33003.
- 15) Tiron, V; Velicu, IL; Dobromir, M; Demeter, A; Samoila, F; Ursu, C; Sirghi, L, Reactive multi-pulse HiPIMS deposition of oxygen-deficient TiO<sub>x</sub> thin films, *THIN SOLID FILMS* 603() 2016, 255-261.
- 16) Tiron, V; Sirghi, L, Tuning the band gap and nitrogen content of ZnO<sub>x</sub>N<sub>y</sub> thin films deposited by reactive HiPIMS, *SURFACE & COATINGS TECHNOLOGY* 282() 2015, 103-106.
- 17) Sirghi, L; Hatanaka, Y; Sakaguchi, K, Photocatalytic property of titanium dioxide thin films deposited by radio frequency magnetron sputtering in argon and water vapour plasma, *APPLIED SURFACE SCIENCE* 352() 2015, 38-41.
- 18) Ruiz, A; Zychowicz, M; Ceriotti, L; Mehn, D; Sirghi, L; Rauscher, H; Mannelli, I; Colpo, P; Buzanska, L; Rossi, F, Microcontact printing and microspotting as methods for direct protein patterning on plasma deposited polyethylene oxide: application to stem cell patterning, *BIOMEDICAL MICRODEVICES* 15(3) 2013, 495-507.
- 19) Tiron, V; Coman, T; Sirghi, L; Popa, G, Atomic force microscopy investigation of piezoelectric response of ZnO thin films deposited by HiPIMS, *JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS*

- 15(43467) 2013, 77-81.
- 20) Tiron, V; Sirghi, L; Popa, G, Control of aluminum doping of ZnO:Al thin films obtained by high-power impulse magnetron sputtering, THIN SOLID FILMS 520(13) 2012, 4305-4309.
  - 21) Kulisch, W; Popov, C; Sasaki, T; Sirghi, L; Rauscher, H; Rossi, F; Reithmaier, JP, On the development of the morphology of ultrananocrystalline diamond films, PHYSICA STATUS SOLIDI A-APPLICATIONS AND MATERIALS SCIENCE 208(1) 2011, 70-80.
  - 22) Sirghi, L, PLASMA CLEANING OF SILICON SURFACE OF ATOMIC FORCE MICROSCOPY PROBES, ROMANIAN JOURNAL OF PHYSICS 56( ) 2011, 144-148.
  - 23) von Keudell, A; Awakowicz, P; Benedikt, J; Raballand, V; Yanguas-Gil, A; Opretzka, J; Flotgen, C; Reuter, R; Byelykh, L; Halfmann, H; Stapelmann, K; Denis, B; Wunderlich, J; Muranyi, P; Rossi, F; Kylian, O; Hasiwa, N; Ruiz, A; Rauscher, H; Sirghi, L; Comoy, E; Dehen, C; Challier, L; Deslys, JP, Inactivation of Bacteria and Biomolecules by Low-Pressure Plasma Discharges, PLASMA PROCESSES AND POLYMERS 7(43528) 2010, 327-352
  - 24) Kulisch, W; Popov, C; Gilliland, D; Ceccone, G; Sirghi, L; Ruiz, A; Rossi, F, Surface properties of differently prepared ultrananocrystalline diamond surfaces, DIAMOND AND RELATED MATERIALS 18(43593) 2009, 745-749.
  - 25) Kulisch, W; Gilliland, D; Ceccone, G; Sirghi, L; Rauscher, H; Gibson, PN; Zurn, M; Bretagnol, F; Rossi, F, Ion beam sputtering of Ta(2)O(5) films on thermoplast substrates as waveguides for biosensors, JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B 27(3) 2009, 1180-1190.
  - 26) Kylian, O; Benedikt, J; Sirghi, L; Reuter, R; Rauscher, H; von Keudell, A; Rossi, F, Removal of Model Proteins Using Beams of Argon Ions, Oxygen Atoms and Molecules: Mimicking the Action of Low-Pressure Ar/O-2 ICP Discharges, PLASMA PROCESSES AND POLYMERS 6(4) 2009, 255-261.
  - 27) Kulisch, W; Freudenstein, R; Ruiz, A; Valsesia, A; Sirghi, L; Ponti, J; Colpo, P; Rossi, F, NANOSTRUCTURED MATERIALS FOR ADVANCED TECHNOLOGICAL APPLICATIONS: A BRIEF INTRODUCTION, NANOSTRUCTURED MATERIALS FOR ADVANCED TECHNOLOGICAL APPLICATIONS ( ) 2009, 3-34.
  - 28) Kulisch, W; Gilliland, D; Ceccone, G; Sirghi, L; Rauscher, H; Gibson, PN; Zurn, M; Bretagnol, F; Rossi, F, TANTALUM PENTOXIDE AS A MATERIAL FOR BIOSENSORS: DEPOSITION, PROPERTIES AND APPLICATIONS, NANOSTRUCTURED MATERIALS FOR ADVANCED TECHNOLOGICAL APPLICATIONS ( ) 2009, 509-524.
  - 29) Rossi, F; Kylian, O; Rauscher, H; Gilliland, D; Sirghi, L, Use of a low-pressure plasma discharge for the decontamination and sterilization of medical devices, PURE AND APPLIED CHEMISTRY 80(9) 2008, 1939-1951.
  - 30) Kulisch, W; Popov, C; Rauscher, H; Sirghi, L; Sasaki, T; Bliznakov, S; Rossi, F, Investigation of the nucleation and growth mechanisms of nanocrystalline diamond/amorphous carbon nanocomposite films, DIAMOND AND RELATED MATERIALS 17(43656) 2008, 1116-1121.
  - 31) Popov, C; Kulisch, W; Bliznakov, S; Ceccone, G; Gilliland, D; Sirghi, L; Rossi, F, Surface modification of nanocrystalline diamond/amorphous carbon composite films, DIAMOND AND RELATED MATERIALS 17(43656) 2008, 1229-1234.
  - 32) Kulisch, W; Gilliland, D; Ceccone, G; Rauscher, H; Sirghi, L; Colpo, P; Rossi, F, Ion beam deposition of tantalum pentoxide thin film at room temperature, JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A 26(4) 2008, 991-995.
  - 33) Heinz, P; Bretagnol, F; Mannelli, I; Sirghi, L; Valsesia, A; Ceccone, G; Gilliland, D; Landfester, K; Rauscher, H; Rossi, F, Poly(N-isopropylacrylamide) grafted on plasma-activated poly(ethylene oxide): Thermal response and interaction with proteins, LANGMUIR 24(12) 2008, 6166-6175.
  - 34) Kylian, O; Rauscher, H; Sirghi, L; Rossi, F, Protein film removal by means of low-pressure microwave plasma - an imaging ellipsometry study, PROCEEDINGS OF THE 17TH INTERNATIONAL VACUUM CONGRESS/13TH INTERNATIONAL CONFERENCE ON SURFACE SCIENCE/INTERNATIONAL CONFERENCE ON NANOSCIENCE AND TECHNOLOGY 100( ) 2008, -62017.
  - 35) Kulisch, W; Popov, C; Bliznakov, S; Ceccone, G; Gilliland, D; Sirghi, L; Rossi, F, Surface and bioproperties of nanocrystalline diamond/amorphous carbon nanocomposite films, THIN SOLID FILMS 515(23) 2007, 8407-8411.
  - 36) Sirghi, L; Kylian, O; Gilliland, D; Ceccone, G; Rossi, F, Cleaning and hydrophilization of atomic force microscopy silicon probes, JOURNAL OF PHYSICAL CHEMISTRY B 110(51) 2006, 25975-25981.
  - 37) Sirghi, L; Popa, G; Hatanaka, Y, Heating of polymer substrate by discharge plasma in radiofrequency magnetron sputtering deposition, THIN SOLID FILMS 515(4) 2006, 1334-1339.
  - 38) Sirghi, L; Hatanaka, Y; Aoki, T, Photocatalytic chemisorption of water on titanium dioxide thin films obtained by radio frequency magnetron deposition, APPLIED SURFACE SCIENCE 244(43469) 2005, 408-411.
  - 39) Miron, C; Roca, A; Hoisie, S; Cozorici, P; Sirghi, L, Photoinduced bactericidal activity of TiO2 thin films obtained by radiofrequency magnetron sputtering deposition, JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS 7(2) 2005, 915-919.
  - 40) Sirghi, L; Aoki, T; Hatanaka, Y, Diagnostics of the radio frequency magnetron discharge plasma used for TiO2 thin film sputtering deposition, SURFACE & COATINGS TECHNOLOGY 187(43499) 2004, 358-363.Q1

- 41) Nakamura, M; Makino, K; Sirghi, L; Aoki, T; Hatanaka, Y, Hydrophilic properties of hydro-oxygenated TiOx films prepared by plasma enhanced chemical vapor deposition, SURFACE & COATINGS TECHNOLOGY 169() 2003, 699-702P II S0587-8972(03)00145-2.
- 42) Sirghi, L; Hatanaka, Y, Hydrophilicity of amorphous TiO<sub>2</sub> ultra-thin films, SURFACE SCIENCE 530(3) 2003, L323-L327.
- 43) Sirghi, L; Aoki, T; Hatanaka, Y, Hydrophilicity of TiO<sub>2</sub> thin films obtained by radio frequency magnetron sputtering deposition, THIN SOLID FILMS 422(43467) 2002, 55-61P II S0040-6090(02)00949-5.
- 44) Nakamura, M; Sirghi, L; Aoki, T; Hatanaka, Y, Study on hydrophilic property of hydro-oxygenated amorphous TiOx : OH thin films, SURFACE SCIENCE 507() 2002, 778-782P II S0039-6028(02)01352-3.
- 45) Sirghi, L; Hatanaka, Y; Popa, G, Control of plasma parameters and wall sheath voltage in radio frequency magnetron discharge by grid bias, JOURNAL OF APPLIED PHYSICS 91(7) 2002, 4026-4032.
- 46) Sirghi, L; Nakamura, M; Hatanaka, Y; Takai, O, Atomic force microscopy study of the hydrophilicity of TiO<sub>2</sub> thin films obtained by radio frequency magnetron sputtering and plasma enhanced chemical vapor depositions, LANGMUIR 17(26) 2001, 8199-8203.
- 47) Nakamura, M; Kato, S; Aoki, T; Sirghi, L; Hatanaka, Y, Formation mechanism for TiOx thin film obtained by remote plasma enhanced chemical vapor deposition in H-2-O-2 mixture gas plasma, THIN SOLID FILMS 401(43467) 2001, 138-144.
- 48) Nakamura, M; Kato, S; Aoki, T; Sirghi, L; Hatanaka, Y, Role of terminal OH groups on the electrical and hydrophilic properties of hydro-oxygenated amorphous TiOx : OH thin films, JOURNAL OF APPLIED PHYSICS 90(7) 2001, 3391-3395.

2/12/2025

Professor Emeritus. Lucel Sirghi

