



PERSONAL INFORMATION

Lucel Sirghi



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Sex M | Nationality Romanian

WORK EXPERIENCE

October 2014-present

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

February, 1992 - December, 1997

Ph. D.

Department of Physics, Alexandru Ioan Cuza University, Blvd. Carol I 11, IASI 700509, Romania

Physics (study of ionization instability in collisional plasmas)

April, 1995 - March, 1997

M. Eng.

Department of Electrical Engineering, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, 446-8555 Japan

System Engineering (study of nonlocal electron kinetics in collisional plasmas)

September, 1970 - June, 1983

BS

Department of Physics, Alexandru Ioan Cuza University, Blvd. Carol I 11, IASI 700509, Romania

Physics (solid state physics)

 ADDITIONAL INFORMATION

Grants	<p>CNCSIS grant type RO-FR 18/06.01.2014 <i>SNON –oxynitrides for solar energy</i></p> <p>CNCSIS, IDEI PNII 267/05.10.2011 <i>Plasma functionalization of nanoscopic probes.</i></p> <p>Grant FP7 nr 224982/2008 FUSINET–<i>A European Fusion Education Network</i>, local manager</p> <p>CNCSIS grant type A 628/2004 <i>AFM study of interaction forces between functionalized surfaces</i></p>
Peer Review Scientific Papers	79 ISI papers
Citations	1452 citations
h-index	21
Scholarships and Awards	<p>Visiting Professor (aprilie-iunie 2014) <i>-proiectul de cercetare:</i> Colloidal lithography used in plasma assisted thin film depositions. <i>-institutie:</i> Research Institute of Electronics, Shizuoka University3-5-1 Johoku, Hamamatsu-shi, 432-8011 JAPAN</p> <p>Senior Scientist Fellowship/Contractual Agent (iunie 2005-noiembrie 2008) <i>-proiectul de cercetare:</i> Biodecon, CellNanoTox (granturi FP6 ale Comisiei Europene). <i>-institutie:</i> Institute for Health and Consumer Protection, European Commission Joint Research Centre, via E. Fermi no. 1, 20201 VA, Italy</p> <p>Fulbright Scholar (septembrie 2004 - martie 2005) <i>-proiectul de cercetare:</i> Studiul cu ajutorul microscopiei cu forta atomic a fortelor de interactiune dintre suprafete chimic functionalizate. <i>-institutie:</i> School of Physics, Georgia Institute of Technology, Atlanta</p> <p>NATO-CNR Scholar (iunie 2004 - august 2004) <i>-proiectul de cercetare:</i> Studiul cu ajutorul microscopiei cu forta atomic a fortelor de adeziune si frecare. <i>-institutie:</i> Istituto di Struttura della Materia, CNR, Via Fosso del Cavalerie 101.1-00133, Roma, Italy.</p> <p>Shizuoka University Visiting Scientist (august 2000 – martie 2003) <i>-project:</i> depunerea asistata de plasma si caracterizarea filmelor fotocatalitice de TiO₂ <i>-institution:</i> Research Institute of Electronics, Shizuoka University3-5-1 Johoku, Hamamatsu-shi, 432-8011 JAPAN</p> <p>Nagoya University Visiting Researcher (octombrie 1999 – iulie 2000) <i>-proiectul de cercetare:</i> Masuratori de forte de suprafata cu ajutorul microscopiei cu forta atomica in proiectul "Biomimetic Material Processing" finantat de Societatea Japoneza de Promovare a Stiintei. <i>-institutie:</i> Graduate School of Engineering, Nagoya University, Chikusa, Nagoya 464-8603, Japan</p>

PUBLICATIONS (Web of Science, Clarivate Analytics, 10 Feb. 2021)

- 1) 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>.
- 2) 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
- 3) Besleaga, A., Demeter, A., Rusu, G. B., Dinca, P., Sirghi., L. PHOTOCATALYTIC ACTIVITY OF TiO₂ FILMS, DEPOSITED BY REACTIVE MULTI-PULSE HiPIMS AT DIFFERENT SUBSTRATE TEMPERATURE VALUES Rom Rep Phys. 71, 2019, 505.
- 4) 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.

- 5) Demeter, A; Tiron, V; Sirghi, L, TiO₂ 2D NANOPATTERNS OBTAINED BY HIGH POWER IMPULSE MAGNETRON SPUTTERING DEPOSITIONS WITH COLLOIDAL MASKS, ROMANIAN REPORTS IN PHYSICS 70(4) 2018, -515.
- 6) 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.
- 7) Demeter, A; Samoila, F; Tiron, V; Stanescu, D; Magnan, H; Stratiuc, M; Burducea, I; Sirghi, L, Visible-light photocatalytic activity of TiO_xN_y thin films obtained by reactive multi-pulse High Power Impulse Magnetron Sputtering, SURFACE & COATINGS TECHNOLOGY 324() 2017, 614-619.
- 8) 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 Ta₃N₅ thin films by augmenting the ion flux onto the substrate, THIN SOLID FILMS 636() 2017, 48-53.
- 9) 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.
- 10) Samoila, F; Sirghi, L, Disjoining Pressure in Partial Wetting on the Nanoscale, LANGMUIR 33(21) 2017, 5188-5196.
- 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 TiO₂ 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_x 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_x thin films, THIN SOLID FILMS 603() 2016, 255-261.
- 16) Tiron, V; Sirghi, L, Tuning the band gap and nitrogen content of ZnO_xN_y 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) Sirghi, L; Tiron, V; Dobromir, M, Friction at single-asperity contacts between hydrogen-free diamond-like carbon thin film surfaces, DIAMOND AND RELATED MATERIALS 52() 2015, 38-42.
- 19) Sirghi, L; Ciumac, D; Tiron, V, Mechanical properties of atomic force microscopy probes with deposited thin films, THIN SOLID FILMS 565() 2014, 267-270.
- 20) Apetrei, A; Sirghi, L, Stochastic Adhesion of Hydroxylated Atomic Force Microscopy Tips to Supported Lipid Bilayers, LANGMUIR 29(52) 2013, 16098-16104.
- 21) 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.
- 22) 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.
- 23) 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.
- 24) Sirghi, L, Transport Mechanisms in Capillary Condensation of Water at a Single-Asperity Nanoscopic Contact, LANGMUIR 28(5) 2012, 2558-2566.
- 25) 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.
- 26) Sirghi, L, PLASMA CLEANING OF SILICON SURFACE OF ATOMIC FORCE MICROSCOPY PROBES, ROMANIAN JOURNAL OF PHYSICS 56() 2011, 144-148.
- 27) 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.
- 28) Sirghi, L; Rossi, F, The effect of adhesion on the contact radius in atomic force microscopy indentation, NANOTECHNOLOGY 20(36) 2009, -365702.
- 29) 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.

- 30) 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.
- 31) 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.
- 32) Sirghi, L; Ruiz, A; Colpo, P; Rossi, F, Atomic force microscopy indentation of fluorocarbon thin films fabricated by plasma enhanced chemical deposition at low radio frequency power, THIN SOLID FILMS 517(11) 2009, 3310-3314.
- 33) Sirghi, L; Bretagnol, F; Mornet, S; Sasaki, T; Gilliland, D; Colpo, P; Rossi, F, Atomic force microscopy characterization of the chemical contrast of nanoscale patterns fabricated by electron beam lithography on polyethylene glycol oxide thin films, ULTRAMICROSCOPY 109(3) 2009, 222-229.
- 34) 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.
- 35) 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.
- 36) Ceriotti, L; Buzanska, L; Rauscher, H; Mannelli, I; Sirghi, L; Gilliland, D; Hasiwa, M; Bretagnol, F; Zychowicz, M; Ruiz, A; Bremer, S; Coecke, S; Colpo, P; Rossi, F, Fabrication and characterization of protein arrays for stem cell patterning, SOFT MATTER 5(7) 2009, 1406-1416.
- 37) Ruiz, A; Buzanska, L; Gilliland, D; Rauscher, H; Sirghi, L; Sobanski, T; Zychowicz, M; Ceriotti, L; Bretagnol, F; Coecke, S; Colpo, P; Rossi, F, Micro-stamped surfaces for the patterned growth of neural stem cells, BIOMATERIALS 29(36) 2008, 4766-4774.
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- 39) 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.
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- 41) 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.
- 42) Sirghi, L; Ponti, J; Broggi, F; Rossi, F, Probing elasticity and adhesion of live cells by atomic force microscopy indentation, EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS 37(6) 2008, 935-945.
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- 45) Bretagnol, F; Sirghi, L; Mornet, S; Sasaki, T; Gilliland, D; Colpo, P; Rossi, F, Direct fabrication of nanoscale bio-adhesive patterns by electron beam surface modification of plasma polymerized poly ethylene oxide-like coatings, NANOTECHNOLOGY 19(12) 2008, -125306.
- 46) 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.
- 47) 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.
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- 50) 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.
- 51) Sirghi, L; Rossi, F, Adhesion and elasticity in nanoscale indentation, APPLIED PHYSICS LETTERS 89(24) 2006, -243118.

- 52) 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.
- 53) Sirghi, L; Szoszkiewicz, R; Riedo, E, Volume of a nanoscale water bridge, LANGMUIR 22(3) 2006, 1093-1098.
- 54) 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.
- 55) 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.
- 56) 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.
- 57) 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, 699-702 PII S0587-8972(03)00145-2.
- 58) Sirghi, L, Effect of capillary-condensed water on the dynamic friction force at nanoasperity contacts, APPLIED PHYSICS LETTERS 82(21) 2003, 3755-3757.
- 59) Sirghi, L; Hatanaka, Y, Hydrophilicity of amorphous TiO₂ ultra-thin films, SURFACE SCIENCE 530(3) 2003, L323-L327.
- 60) Sirghi, L; Aoki, T; Hatanaka, Y, Friction force microscopy study of the hydrophilicity of TiO₂ thin films deposited by radio frequency magnetron sputtering, SURFACE REVIEW AND LETTERS 10(43499) 2003, 345-349.
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- 62) Sirghi, L; Popa, G; Hatanaka, Y, Charged particles in the reactor chamber of a remote plasma enhanced CVD system, PLASMA PHYSICS 669() 2003, 369-372.
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12/01/2022

Prof. dr. habil. Lucel Sirghi