

INFORMATII PERSONALE

Lucel Sirghi



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Sex M | Data nasterii 05/10/1959 | Nationalitatea Romana

FUNCTII OCUPATE

Octombrie 2014-present

Professor

Departmentul of Fizica, Universitatea Alexandru Ioan Cuza

Didactic: prelegeri de fizica plasmei, diagnoza plasmeri și analiză structurală a materiei biologice

Cercetare: depuneri de filme subțiri asistată de plasmă cu aplicare în mediu, energie și medicină, funcționalizare cu plasma a suprafețelor, studii bazate pe microscopia cu forța atomic a forțelor de suprafață (frecare și forțe adezive) pentru oxizi, polimeri și probe biologice

Domeniu de activitate Educație și Cercetare Științifică

Octombrie 1990-
Octombrie 2014

Conferentiar/Lector/Asistent

Departmentul of Fizica, Universitatea Alexandru Ioan Cuza

Didactic: prelegeri, experimente didactice și seminarii de fizica plasmei, diagnoza plasmei, modelare numerică și analogică a proceselor biologice, analiza structurală a materiei biologice

Cercetare: procese fundamentale în plasma (instabilități și straturi de sarcină spațială), depuneri cu filme subțiri și procesarea suprafețelor asistată de plasmă, funcționalizare și curățare cu plasmei și studii bazate pe microscopia cu forța atomic a forțelor de suprafață (frecare și forțe adezive) pentru oxizi, polimeri și probe biologice

Domeniu de activitate Educație și Cercetare Științifică

Septembrie 1983-
Octombrie 1990

Profesor în Învățământul Preuniversitar

Scoala nr. 2, Suceava, Romania

Didactic: predare disciplină fizică în învățământul preuniversitar;

Domeniu de activitate Educație

STUDII

Februarie, 1992 -
Decembrie, 1997

Ph. D.

Facultatea de Fizica, Universitatea Alexandru Ioan Cuza, Blvd. Carol I 11, IASI 700509, Romania

Fizica plasmei (contribuții la studiul instabilităților de ionizare în plasmă colizionale)

Aprilie, 1995 - Martie, 1997

M. Eng.

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

Septembrie, 1970 - Iunie,

System Engineering (studiul cineticii nelocale în plasma colizională)

BS

1983

Facultatea de Fizica, Universitatea Alexandru Ioan Cuza, Blvd. Carol I 11, IASI
700509, Romania

Fizica (Studiul proprietatilor magnetice ale aliajelor metalice)

Didactic: predare disciplina fizica in invatamantul preuniversitar;

Domeniu de activitate Educatie

DIRECTII DE CERCETARE

1. Surse de plasma la presiune joasa si la presiune atmosferica. Diagnoza plasmei prin metode electrice si optice,
2. Aplicatii ale plasmei in procesarea materialelor. Depuneri de straturi subtiri in plasma magnetron; Functionalizarea cu plasma a suprafetelor. Decontaminarea chimica si biologica cu ajutorul plasmei a suprafetelor.
3. Aplicatii ale plasmei in nanotehnologie. Fabricarea cu ajutorul plasmei si litografiei coloidale de suprafete nanostructurate
4. Studiul fortelor si proprietatilor de suprafata cu ajutorul microscopului cu forta atomica

GRANTURI

- **CNCSIS grant type RO-FR 18/06.01.2014** *SNON –oxinitruri pentru energie solara*
- **CNCSIS, IDEI PNII 267/05.10.2011** *Functionalizarea cu plasma a sondelor nanoscopice*
- **Grant FP7 nr 224982/2008** FUSINET–*A European Fusion Education Network*, local manager
- **CNCSIS grant type A 628/2004** *Studiu AFM al fortelor de interactiune dintre suprafete functionalizate chimic.*

Lucrari stiintifice ISI: 80

Citari 1633

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STAGII DE CERCETARE IN STRAINATATE

Visiting Professor (aprilie-iunie 2014)

-*proiectul de cercetare:* Colloidal lithography used in plasma assisted thin film depositions.

-*institutie:* 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).

-*institutie:* 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 atomica a fortelor de interactiune dintre suprafete chimic functionalizate.

-*institutie:* School of Physics, Georgia Institute of Technology, Atlanta

NATO-CNR Scholar (iunie 2004 - august 2004)

-*proiectul de cercetare:* Studiul cu ajutorul microscopiei cu forta atomica a fortelor de adeziune si frecare.

-*institutie:* Istituto di Struttura della Materia, CNR, Via Fosso del Cavaliere 101.1-00133, Roma, Italy.

Shizuoka University Visiting Scientist (august 2000 – martie 2003)

-*project:* depunerea asistata de plasma si caracterizarea filmelor fotocatalitice de TiO₂

-*institutie:* Research Institute of Electronics, Shizuoka University 3-5-1 Johoku, Hamamatsu-shi, 432-8011 JAPAN

Nagoya University Visiting Researcher (octombrie 1999 – iulie 2000)

-*proiectul 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.

-institutie: Graduate School of Engineering, Nagoya University, Chikusa, Nagoya 464-8603, Japan

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

- 1) Tifui, G; Dobromir, M; Sirghi, L, Stiffening of polydimethylsiloxane surface as result of exposure to low-pressure argon discharge plasma, PLASMA PROCESSES AND POLYMERS, AUG 2023, Vol.20, 8, -, DOI: 10.1002/ppap.202300014;
- 2) Besleaga, A; Apetrei, A; Sirghi, L, Atomic force spectroscopy with magainin 1 functionalized tips and biomimetic supported lipid membranes, EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS, JAN 2022, Vol.51, 1, 29-40, DOI: 10.1007/s00249-021-01580-y
- 3) Teodoroff-Onesim, S; Besleaga, A; Sirghi, L, Synthesis of octadecyltrichlorosilane self-assembled monolayer films by vapor deposition on plasma activated silicon substrates, THIN SOLID FILMS, OCT 31 2021, Vol.736, -, DOI: 10.1016/j.tsf.2021.138907.
- 4) 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
- 5) 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.
- 6) 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.
- 7) 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.
- 8) 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.
- 9) Demeter, A; Samoila, F; Tiron, V; Stanescu, D; Magnan, H; Straticiuc, 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.
- 10) 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.
- 11) 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.
- 12) Samoila, F; Sirghi, L, Disjoining Pressure in Partial Wetting on the Nanoscale, LANGMUIR 33(21) 2017, 5188-5196.
- 13) 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.
- 14) 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.
- 15) 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.
- 16) Sirghi, L, Plasma synthesis of photocatalytic TiO_x thin films, PLASMA SOURCES SCIENCE & TECHNOLOGY 25(3) 2016, -33003.
- 17) 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.
- 18) 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.
- 19) 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.
- 20) 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.
- 21) Sirghi, L; Ciumac, D; Tiron, V, Mechanical properties of atomic force microscopy probes with deposited thin films, THIN SOLID FILMS 565() 2014, 267-270.
- 22) Apetrei, A; Sirghi, L, Stochastic Adhesion of Hydroxylated Atomic Force Microscopy Tips to Supported Lipid Bilayers, LANGMUIR 29(52) 2013, 16098-16104.

- 23) 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.
- 24) 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.
- 25) 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.
- 26) Sirghi, L, Transport Mechanisms in Capillary Condensation of Water at a Single-Asperity Nanoscopic Contact, *LANGMUIR* 28(5) 2012, 2558-2566.
- 27) 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.
- 28) Sirghi, L, PLASMA CLEANING OF SILICON SURFACE OF ATOMIC FORCE MICROSCOPY PROBES, *ROMANIAN JOURNAL OF PHYSICS* 56() 2011, 144-148.
- 29) 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.
- 30) Sirghi, L; Rossi, F, The effect of adhesion on the contact radius in atomic force microscopy indentation, *NANOTECHNOLOGY* 20(36) 2009, -365702.
- 31) 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.
- 32) 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.
- 33) 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.
- 34) 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.
- 35) 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.
- 36) 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.
- 37) 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.
- 38) 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.
- 39) 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.
- 40) Mornet, S; Bretagnol, F; Mannelli, I; Valsesia, A; Sirghi, L; Colpo, P; Rossi, F, Large-Scale Fabrication of Bi-Functional Nanostructured Polymer Surfaces for Selective Biomolecular Adhesion, *SMALL* 4(11) 2008, 1919-1924.
- 41) 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.
- 42) 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.
- 43) 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.
- 44) 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.
- 45) 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.
- 46) 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.
 - 47) 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.
 - 48) 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.
 - 49) 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.
 - 50) Gohier, A; Djouadi, MA; Dubosc, M; Granier, A; Minea, TM; Sirghi, L; Rossi, F; Paredes, P; Alvarez, F, Single- and few-walled carbon nanotubes grown at temperatures as low as 450 degrees C: Electrical and field emission characterization, *JOURNAL OF NANOSCIENCE AND NANOTECHNOLOGY* 7(9) 2007, 3350-3353.
 - 51) Belegriou, S; Mannelli, I; Sirghi, L; Bretagnol, F; Valsesia, A; Rauscher, H; Rossi, F, Formation of viscoelastic protein droplets on a chemically functionalized surface, *JOURNAL OF PHYSICAL CHEMISTRY B* 111(30) 2007, 8713-8716.
 - 52) 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.
 - 53) Sirghi, L; Rossi, F, Adhesion and elasticity in nanoscale indentation, *APPLIED PHYSICS LETTERS* 89(24) 2006, -243118.
 - 54) 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.
 - 55) Sirghi, L; Szoszkiewicz, R; Riedo, E, Volume of a nanoscale water bridge, *LANGMUIR* 22(3) 2006, 1093-1098.
 - 56) 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.
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 - 58) 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.
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