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WORK EXPERIENCE

Lecturer

Physics Department, University Politehnica of Bucharest [10/2017 – Current]

City: Bucharest

Scientific researcher

Center for Microscopy-Microanalysis and Information Processing, University Politehnica of Bucharest [10/2017 – Current]

City: Bucharest

Associate lecturer

Physics Department, University Politehnica of Bucharest [02/2016 – 09/2017]

City: Bucharest

PostDoc

Physics Department, University Politehnica of Bucharest [04/2014 – 12/2015]

Address: (Romania)

Research Assistant

Center for Microscopy-Microanalysis and Information Processing, University Politehnica of Bucharest [10/2007 – 09/2017]

Address: (Romania)

City: Bucharest

Layout designer

Catalyst Semiconductor Romania [07/2005 – 07/2007]

Address: Bucharest

City: Bucharest

EDUCATION AND TRAINING

Bioimage Analysis Training School

[09/2017]

Address: Gothenburg (Sweden)

Super Resolution Intensive Practical School

Italian Institute of Technology [12/2012]

Address: Genoa (Italy)

Summer School on Photonics

Fresnel Institute [09/2009]

Address: (France)

PhD in Electronics

University Politehnica of Bucharest [2007 – 2012]

Address: (Romania)

Studies on photonic quantum ring semiconductor laser structures and on semiconductor materials and nanocrystals using laser scanning microscopy techniques

Electronics Engineer

Faculty of Electronics, Telecommunications and Information Technology, UPB [2002 – 2007]

Address: (Romania)

Optoelectronics

LANGUAGE SKILLS

Mother tongue(s):

Romanian

English

LISTENING: C1 READING: C1 WRITING: C1

SPOKEN PRODUCTION: B2 SPOKEN INTERACTION: B2

German

LISTENING: B1 READING: A2 WRITING: A2

SPOKEN PRODUCTION: A2 SPOKEN INTERACTION: A2

RESEARCH INTERESTS

Research interests

laser scanning microscopy, scanning probe microscopy, nonlinear optical microscopy, super-resolution microscopy, biophotonics, optics

PARTICIPATION IN NATIONAL RESEARCH PROJECTS

Participation in national research projects

2020-2022 PN-III-P1-1.1-TE-2019-1756: Integration of pixel-wise and whole image classification of second harmonic generation microscopy datasets for thyroid pathology (SHGThyPath) – **project leader**

2018-2020 PN-III-P1-1.1-TE-2016-2147: Quantitative label-free second harmonic generation microscopy at the nanoscale (NANOSHG) – **project leader**

2018-2020 PN-III-P1-1.1-TE-2016-2147: Correlative optical imaging in the far-field and near-field regimes: technical developments and applications (CORIMAG) – **research team member**

2017-2018 PN-III-P2-2.1-PED-2016: An experimental machine intelligence framework for the automated differentiation of the healthy, dysplastic and malignant tissues based on multiphoton microscopy datasets (MICAND) – **research team member**

2017-2018 PN-III-P2-2.1-PED-2016: Quantitative nanoscopy for the characterization of biological tissues (Q-NANOBIOT) – **research team member**

2016-2017 Investigations on the function and micro-structure of the cellulase secretion system by high-resolution imaging techniques (CESESYS) – **research team member**

2015-2017 Correlation and integration of microscopy and nanoscopy data by advanced computer vision methods (MICRONANO) – **research team member**

2014-2015 (POSDRU 132397) Post-doctoral research fellowship: Integrated microscopy combining laser scanning and probe scanning techniques – **principal investigator**

2012-2016 Innovative method and system for the detection of drug traces by plasma-laser assisted mass spectroscopy (ISPLAMS) – **partner leader**

2012-2016 New methods and investigation protocols for the early diagnosis, efficient screening, prognostic and therapy of non-melanoma skin cancers based on existing and novel micro&nano optical tools (NANOLASCAN) – **research team member**

2009-2011 PNII-IDEI: Developments of new investigation techniques in scanning optical microscopy and their applications – **research team member**

2007-2010 PNII: Active-adaptive optic metrology research for nanosciences and nanotechnologies for adaptive digital holography (MAST) – **research team member**

2007-2010 PNII: Studies regarding interaction mechanisms between laser and radio-frequency radiation with superior aerodigestive tissues and the development of therapeutic protocols (LARFMED) – **research team member**

2007-2010 PNII: Studies of modifications introduced in zirconia, spinel and SiC by ionic implantation and thermal treatments by using IBA and other advanced techniques (CERNUCL) – **research team member**

2007-2010 PNII: Impact of environmental factors to the formation dynamics and structural behavior of temporary teeth (MEDSTOMA) – **research team member**

2005-2008 Interdisciplinary network for the synthesis and characterization of semiconductor and conductor nanostructures for photonic and optoelectronic devices and for biomedical applications (NANOCRYSTALNET) – **research team member**

PARTICIPATION IN INTERNATIONAL RESEARCH PROJECTS

Participation in international research projects

2019-2020 Project funded by H2020 ATTRACT's competition for breakthrough technology concepts: Higher-harmonic Generation Microscopy Beyond the Diffraction Barrier based on Re-scan Strategies for Optical Data Acquisition (HARMOPLUS) – **research team member**

2019-2020 Project funded by H2020 ATTRACT's competition for breakthrough technology concepts: A novel approach for near-field optical microscopy based on tip-enhanced fluorescence via plasmon resonance energy transfer (TEFPLASNOM) – **research team member**

2018-2020 ERA-NET: Innovative technology for assessing the periodontal disease and new periodontitis treatment based on hyaluronic acid and melatonin (HAMELDENT) – **research team member**

2018-2019 Bilateral scientific cooperation Romania-China: Novel optical imaging approaches for the in-depth understanding of advanced nanostructured materials and their interaction with biological species (NANOMATBIOIMAGE) – **research team member**

2018-2019 Bilateral scientific cooperation Romania-China: A new strategy for maximizing the fuel cell catalysis by controlling/tuning the defects and interfaces of PtPb nanoplates using ion irradiation technique (MICROFUELL) – **research team member**

2012-2015 EU-CORDIS-FP7: Real time label free nanoscopy using infrared absorption (LANIR) – **research team member**

2011-2012 Bilateral scientific cooperation Romania-Slovakia: Development of the investigation method for inorganic thin films by using high resolution methods – **research team member**

2010-2011 Bilateral scientific cooperation Romania-Turkey: The influence of the surface properties of the nano-organic thin films on their gas sensing mechanisms investigated by using high resolution techniques (NAFIGA) – **research team member**

2008-2011 EU-CORDIS-FP7: Electrically modified biomaterials surface: from atoms to applications (BioElectricSurface) – **research team member**

Journal articles

2020

Huttunen, M.J., **Hristu, R.**, Dumitru, A., Floroiu, I., Costache, M. and Stanciu, S.G., 2020. Multiphoton microscopy of the dermoepidermal junction and automated identification of dysplastic tissues with deep learning. *Biomedical Optics Express*, 11(1), pp.186-199.

Stanciu, S.G., Tranca, D.E., Pastorino, L., Boi, S., Song, Y.M., Yoo, Y.J., Ishii, S., **Hristu, R.**, Yang, F., Bussetti, G. and Stanciu, G.A., 2020. Characterization of Nanomaterials by Locally Determining Their Complex Permittivity with Scattering-Type Scanning Near-Field Optical Microscopy. *ACS Applied Nano Materials*, 3(2), pp.1250-1262.

Tranca, D.E., Stanciu, S.G., **Hristu, R.**, Latterini, L. and Stanciu, G.A., 2020. Surface optical characterization at nanoscale using phasor representation of data acquired by scattering scanning near-field optical microscopy. *Applied Surface Science*, 509, p.145347.

Lucidi, M., **Hristu, R.**, Nichele, L., Stanciu, G.A., Tranca, D.E., Holban, A.M., Visca, P., Stanciu, S.G. and Cincotti, G., 2020. STED nanoscopy of KK114-stained pathogenic bacteria. *Journal of Biophotonics*, 13(9), p.e202000097.

Bueno, J.M., Ávila, F.J., **Hristu, R.**, Stanciu, S.G., Eftimie, L. and Stanciu, G.A., 2020. Objective analysis of collagen organization in thyroid nodule capsules using second harmonic generation microscopy images and the Hough transform. *Applied Optics*, 59(23), pp.6925-6931.

Hristu, R., Eftimie, L.G., Paun, B., Stanciu, S.G. and Stanciu, G.A., 2020. Pixel-level angular quantification of capsular collagen in second harmonic generation microscopy images of encapsulated thyroid nodules. *Journal of Biophotonics*, p.e202000262.

2019

R. Hristu, L.G. Eftimie, B. Paun, S.G. Stanciu, D.E. Tranca, G.A. Stanciu: *Quantitative Multiphoton Microscopy in Cancer Research*. Imaging and Microscopy (2019)

S. L. Iconaru, A. Groza, G. E. Stan, D. Predoi, S. Gaiaschi, R. Trusca, C. M. Chifiriuc, L. Marutescu, T. Tite, G. A. Stanciu, **R. Hristu**, L. Ghegoiu, M. L. Badea, C. S. Turculet, M. Gangiu, P. Chapon: *Preparations of Silver/Montmorillonite Biocomposite Multilayers and Their Antifungal Activity*. Coatings 9(12) (2019)

Y. Liang, P. Wang, Y. Wang, Y. Dai, Z. Hu, D. E. Tranca, **R. Hristu**, S. G. Stanciu, A. Toma, G. A. Stanciu, X. Wang, E. Fu. *Growth Mechanisms and the Effects of Deposition Parameters on the Structure and Properties of High Entropy Film by Magnetron Sputtering*. Materials 12(18), pp. 3008 (2019)

B. Paun, **R. Hristu**, S. G. Stanciu, A. V. Dumitru, M. Costache, G. A. Stanciu: *Strategies for Optimizing the Determination of Second-Order Nonlinear Susceptibility Tensor Coefficients for Collagen in Histological Samples*. IEEE Access 7, pp. 135210-135219 (2019)

2018

C. S. Turculet, A. M. Prodan, I. Negoi, G. Teleanu, M. Popa, E. Andronescu, M. Beuran G. A. Stanciu, **R. Hristu**, M. L. Badea, A. Iosif, S. M. Raita, N. Vineticu, R. Trusca, O. Lupescu. *Preliminary evaluation of the antifungal activity of samarium doped hydroxyapatite thin films*. Romanian Biotechnology Letters 23, pp. 13928-13932 (2018)

R. Hristu, L. G. Eftimie, S. G. Stanciu, D. E. Tranca, B. Paun, M. Sajin, G. A. Stanciu: *Quantitative second harmonic generation microscopy for the structural characterization of*

capsular collagen in thyroid neoplasms. Biomedical Optics Express 9(8), pp. 3923-3936 (2018)

L. Eftimie, **R. Hristu**, M. Dumitrescu, M. Costache, S. G. Stanciu, M. Sajin, G. A. Stanciu: *Modern methods to differentiate benign thyroid nodules from malignant ones*. Romanian Journal of Military Medicine 121(1) (2018)

D. E. Tranca, S. G. Stanciu, **R. Hristu**, B. M. Witgen, G. A. Stanciu: *Nanoscale mapping of refractive index by using scattering-type scanning near-field optical microscopy*. Nanomedicine: Nanotechnology, Biology and Medicine 14(1), pp. 47-50 (2018)

2017

S. G. Stanciu, D. E. Tranca, **R. Hristu**, G. A. Stanciu: *Correlative imaging of biological tissues with apertureless scanning near-field optical microscopy and confocal laser scanning microscopy*. Biomedical optics express 8(12), pp. 5374-5383 (2017)

S. G. Stanciu, F. J. Ávila, **R. Hristu**, J. M. Bueno: *A study on image quality in polarization-resolved second harmonic generation microscopy*. Scientific reports 7(1) (2017)

R. Hristu, S. G. Stanciu, D. E. Tranca, E. K. Polychroniadis, G. A. Stanciu: *Identification of stacking faults in silicon carbide by polarization-resolved second harmonic generation microscopy*. Scientific reports 7(1) (2017)

R. Hristu, S.G. Stanciu, D.E. Tranca, G.A. Stanciu: *Improved quantification of collagen anisotropy with polarization-resolved second harmonic generation microscopy*. Journal of Biophotonics 10(9), pp. 1171-1179 (2017).

S. Iconaru, G. Stanciu, **R. Hristu**, R. Ghita: *Properties of samarium doped hydroxyapatite thin films deposited by evaporation*. Romanian Reports in Physics 69, 50 (2017)

2016

D. E. Tranca, S. G. Stanciu, **R. Hristu**, C. Stoichita, G. A. Stanciu: *Amplitude and phase reconstruction issues in scattering scanning near-field optical microscopy*. University Politehnica of Bucharest Scientific Bulletin-Series A-Applied Mathematics and Physics 78, pp. 253-262 (2016)

I. A. Kartsonakis, S. G. Stanciu, A. A. Matei, **R. Hristu**, A. Karantonis, C. A. Charitidis: *A comparative study of corrosion inhibitors on hot-dip galvanized steel*. Corrosion Science 112, pp. 289-307 (2016)

S. G. Stanciu, D. E. Tranca, C. Ruggiero, G. A. Stanciu, E. Dellacasa, A. Antipov, **R. Hristu**, L. Pastorino: *Combined far-field, near-field and topographic imaging of nano-engineered polyelectrolyte capsules*. Materials Letters 183, pp. 105-108 (2016)

S.L. Iconaru, A.M. Prodan, C.S. Turculet, M. Beuran, R.V. Ghita, A. Costescu, A. Groza, M.C. Chifiriuc, P. Chapon, S. Gaiaschi, **R. Hristu**, G. A. Stanciu, R. Trusca, M. Ganciu, S. M. Raita, N. Vineticu, C.S. Ciobanu: *Enamel based composite layers deposited on titanium substrate with antifungal activity*. Journal of Spectroscopy, 2016, DOI: 10.1155/2016/4361051

D.E. Tranca, S.G. Stanciu, **R.Hristu**, C. Stoichita, S. A. M. Tofail, G.A. Stanciu: *Nanoscale Mapping of Dielectric Function by scattering Scanning Near-Field Optical Microscopy*. Imaging and Microscopy 18 (1), pp. 40-42 (2016)

S.G. Stanciu, D.E. Tranca, G.A. Stanciu, **R. Hristu**, J.M. Bueno: *Perspectives on Combining Nonlinear Laser Scanning Microscopy and Bag-Of-Features Data Classification Strategies for Automated Disease Diagnostics*. Optical and Quantum Electronics 48(6), pp. 1-13 (2016)

S.G. Stanciu, M. Costache, D.E. Tranca, **R. Hristu**, M. Popescu, G.A. Stanciu: *Towards Imaging Skin Cancer by Apertureless Scanning Near-Field Optical Microscopy*, University Politehnica of Bucharest Scientific Bulletin-Series A-Applied Mathematics and Physics 78(2), pp. 235-244 (2016).

I.C. Dragoi, S.G. Stanciu, **R. Hristu**, H.G. Coanda, D.E. Tranca, M. Popescu, D. Coltuc: *Embedding complementary imaging data in laser scanning microscopy micrographs by reversible watermarking*. Biomedical Optics Express 7(4), pp. 1127-1137 (2016).

D.E. Tranca, E. Sanchez-Ortiga, G. Saavedra, M. Martinez-Corral, S.A.M. Tofail, S.G. Stanciu, **R. Hristu**, G.A. Stanciu: *Mapping electron-beam-injected trapped charge with scattering scanning near-field optical microscopy*. Optics Letters 41(5), pp. 1046-1049 (2016).

2015

R. Hristu, S.G. Stanciu, D.E. Tranca, G.A. Stanciu: *Electron beam influence on the carbon contamination of electron irradiated hydroxyapatite thin films*. Applied Surface Science 346, pp. 342-347 (2015).

D.E. Tranca, S.G. Stanciu, **R. Hristu**, C. Stoichita, S.A.M. Tofail, G.A. Stanciu: *High-resolution quantitative determination of dielectric function by using scattering scanning near-field optical microscopy*. Scientific Reports 5, 11876 (2015).

C.S. Ciobanu, A. Groza, S.L. Iconaru, C.L. Popa, P. Chapon, M.C. Chifiriuc, **R. Hristu**, G.A. Stanciu, C.C. Negrilă, R. Ghita, M. Ganciu, D. Predoi: *Antimicrobial activity evaluation on silver doped hydroxyapatite/polydimethylsiloxane composite layer*. BioMed Research International, 926513 (2015).

I.A. Kartsonakis, S.G. Stanciu, A.A. Matei, E.K. Karaxi, **R. Hristu**, A. Karantonis, C.A. Charitidis: *Evaluation of the protective ability of typical corrosion inhibitors for magnesium alloys towards the Mg ZK30 variant*. Corrosion Science 100, pp. 194-208 (2015).

A.A. Matei, I. Pencea, S.G. Stanciu, **R. Hristu**, I. Antoniac, E. Ciovisa, C.E. Sfat, G.A. Stanciu: *Structural characterization and adhesion appraisal of TiN and TiCN coatings deposited by CAE-PVD technique on a new carbide composite cutting tool*. Journal of Adhesion Science and Technology 29(23), pp. 2576-2589 (2015).

2014

I. Capan, M. Erdogan, B. Guner, B. Ilhan, S.G. Stanciu, **R. Hristu**, G.A. Stanciu: *Gas Sensing Properties of Porphyrin Thin Films Influenced by Their Surface Morphologies*. Sensor Letters 12(8), pp. 1218-1227 (2014).

M. Bilcu, A.M. Grumezescu, A.E. Oprea, R.C. Popescu, G.D. Mogosanu, **R. Hristu**, G.A. Stanciu, D.E. Mihailescu, V. Lazar, E. Bezirtzoglou, M.C. Chifiriuc: *Efficiency of Vanilla, Patchouli and Ylang Ylang Essential Oils Stabilized by Iron Oxide@C14 Nanostructures against Bacterial Adherence and Biofilms Formed by Staphylococcus aureus and Klebsiella pneumoniae Clinical Strains*. Molecules 19, pp. 17943-17956 (2014).

D. E. Tranca, C. Stoichita, **R. Hristu**, S. G. Stanciu, G. A. Stanciu: *A study on the image contrast of pseudo-heterodyned scattering scanning near-field optical microscopy*. Optics Express 22(2), pp. 1687-1696 (2014).

R. Hristu, D. E. Tranca, S. G. Stanciu, M. Gregor, T. Plecenik, M. Truchly, T. Roch, S. A. M. Tofail, G. A. Stanciu: *Surface charge and carbon contamination on an electron beam*

irradiated hydroxyapatite thin film investigated by photoluminescence and phase imaging in atomic force microscopy. Microscopy and Microanalysis 20(2), pp. 586-595 (2014).

R. Hristu, S. G. Stanciu, D. E. Tranca, A. Matei, G. A. Stanciu: *Nonlinear optical imaging of defects in cubic silicon carbide epilayers*. Scientific Reports 4, 5258 (2014).

2013

M.C. Chifiriuc, A.M. Grumezescu, C. Saviuc, **R. Hristu**, V. Grumezescu, C. Bleotu, G. Stanciu, D.E. Mihaiescu, E. Andronescu, V. Lazar, R. Radulescu: *Magnetic Nanoparticles for Controlling in vitro Fungal Biofilms*. Current Organic Chemistry 17(10), pp. 1023-1028 (2013).

2012

A.M. Grumezescu, M.C. Chifiriuc, C. Saviuc, V. Grumezescu, **R. Hristu**, D.E. Mihaiescu, G.A. Stanciu, E. Andronescu: *Hybrid Nanomaterial for Stabilizing the Antibiofilm Activity of Eugenia carryophyllata Essential Oil*. IEEE Transactions on Nanobioscience 11(4), pp. 360-365 (2012).

I. Capan, M. Erdogan, G.A. Stanciu, S.G. Stanciu, **R. Hristu**, M. Goktepe: *The interaction between the gas sensing and surface morphology properties of LB thin films of porphyrins in terms of the adsorption kinetics*. Materials Chemistry and Physics 136(2-3), pp. 1130-1136 (2012).

R. Hristu, S.G. Stanciu, G.A. Stanciu, I. Capan, B. Guner, M. Erdogan: *Influence of atomic force microscopy acquisition parameters on thin film roughness analysis*. Microscopy Research and Technique 75(7), pp. 921-927 (2012).

R. Hristu, S.G. Stanciu, F.J. Kao, G.A. Stanciu: *Two-photon excited photoluminescence of photonic quantum ring laser structures*. Applied Physics B: Lasers and Optics 107(1), pp. 97-101 (2012).

R. Hristu, G.A. Stanciu: *Imaging of photonic quantum ring lasers by using optical beam induced current microscopy*. University Politehnica of Bucharest Scientific Bulletin-Series A-Applied Mathematics and Physics 74(2), pp. 123-130 (2012).

2011

A.M. Grumezescu, C. Saviuc, M.C. Chifiriuc, **R. Hristu**, D.E. Mihaiescu, P. Balaure, G. Stanciu, V. Lazar: *Inhibitory Activity of Fe₃O₄/Oleic Acid/Usnic Acid-Core/Shell/Extra-Shell Nanofluid on S. aureus Biofilm Development*. IEEE Transactions on Nanobioscience 10(4), pp. 269-274 (2011).

C. Saviuc, A.M. Grumezescu, M.C. Chifiriuc, C. Bleotu, G.A. Stanciu, **R. Hristu**, D. Mihaiescu, V. Lazar: *In vitro methods for the study of artificial fungal biofilms*. Biointerface Research in Applied Chemistry 1(1), pp. 31-40 (2011).

A.M. Grumezescu, C. Saviuc, A. Holban, **R. Hristu**, C. Croitoru, G.A. Stanciu, C. Chifiriuc, D. Mihaiescu, P. Balaure, V. Lazar: *Magnetic chitosan for drug targeting and in vitro drug delivery response*. Biointerface Research in Applied Chemistry 1(5), pp. 160-165 (2011).

D. Cayci, S.G. Stanciu, I. Capan, M. Erdogan, B. Guner, **R. Hristu**, G.A. Stanciu: *The influence of the surface morphologies of Langmuir Blodgett (LB) thin films of porphyrins on their gas sensing properties*. Sensors and Actuators B: Chemical 158(1), pp. 62-68 (2011).

S.G. Stanciu, **R. Hristu**, G.A. Stanciu: *Digital Image Inpainting and Microscopy Imaging*. Microscopy Research and Technique 74(11), pp. 1049-1057 (2011).

C. Saviuc, A.M. Grumezescu, C.M. Chifiriuc, D.E. Mihaiescu, **R. Hristu**, G. Stanciu, E. Oprea, V. Radulescu, V. Lazar: *Hybrid Nanosystem for Stabilizing Essential Oils in Biomedical Applications*. Digest Journal of Nanomaterials and Biostructures 6(4), pp. 1657-1666 (2011).

R. Hristu, S.G. Stanciu, S.J. Wu, F.J. Kao, O. Kwon, G.A. Stanciu: *Optical beam induced current microscopy of photonic quantum ring lasers*. Applied Physics B: Lasers and Optics 103(3), pp. 653-657 (2011).

S.G. Stanciu, **R. Hristu**, G.A. Stanciu: *Influence of Confocal Scanning Laser Microscopy specific acquisition parameters on the detection and matching of Speeded-Up Robust Features*. Ultramicroscopy 111(5), pp. 364-374 (2011).

2010

S.G. Stanciu, **R. Hristu**, R. Boriga, G.A. Stanciu: *On the Suitability of SIFT Technique to Deal with Image Modifications Specific to Confocal Scanning Laser Microscopy*. Microscopy and Microanalysis 16(5), pp. 515-30 (2010).

C. Saviuc, L. Dascalu, M.C. Chifiriuc, V. Radulescu, E. Oprea, M. Popa, **R. Hristu**, G.A. Stanciu, V. Lazar: *The inhibitory activity of pomelo essential oil on the bacterial biofilms development on soft contact lenses*. Roumanian Archives of Microbiology and Immunology 69(3), pp. 145-152 (2010).

N. Dutta, D. Mohanta, G.A. Ahmed, A. Choudhury, **R. Hristu**, S.G. Stanciu, G.A. Stanciu: *Two Photon Emission and Nonlinear Optical Imaging of Acetonitrile-Treated Quasi-Spherical Nanoscale PbS Systems*. IEEE Photonics Journal 2(6), pp. 1060-1068 (2010).