

INFORMAȚII PERSONALE Cătălin Mihai TICOȘ



📍 Extreme Light Infrastructure - Nuclear Physics (ELI-NP)
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EXPERIENȚA PROFESIONALĂ

2021-prezent	Cercetător științific gradul I (CS I) ELI-NP, Institutul Național de Cercetare-Dezvoltare pentru Fizică și Inginerie Nucleară Horia Hulubei (IFIN-HH), Str. Reactorului Nr 30, 077125, Măgurele-Ilfov, România Implementarea proiectului și realizarea de experimente în cadrul ELI-NP
2020-2021	Șef Departament Experimente cu Laseri (LDED), CS I ELI-NP, Institutul Național de Cercetare-Dezvoltare pentru Fizică și Inginerie Nucleară Horia Hulubei (IFIN-HH), Str. Reactorului Nr 30, 077125, Măgurele-Ilfov, România Implementarea proiectului ELI-NP
2020-prezent	Conducător de doctorat (abilitare) Școala Doctorală de Ingineria și Aplicațiile Laserilor și Acceleratorilor (SDIALA) – Universitatea Națională de Știință și Tehnologie Politehnica București
2011-2019	Șef Laborator Acceleratoare de Electroni 230 Institutul Național pentru Fizica Laserilor, Plasmei și Radiației - INFLPR, Str. Atomistilor nr. 409, 077125, Măgurele-Ilfov, România Manager al activității laboratorului Liderul unui grup de tineri cercetători (6 doctoranzi, cercetători postdoctorali și CSIII) în proiecte de fizica fasciculelor de electroni și fizica plasmei Membru al Consiliului Științific al INFLPR Membru al Comitetului de Direcție al INFLPR
2009-prezent, 2007-2009	Cercetător științific gradul I (CS I), Cercetător științific (CS) Institutul Național pentru Fizica Laserilor, Plasmei și Radiației - INFLPR, Str. Atomistilor nr. 409, 077125, Măgurele-Ilfov, România Director de proiect în fizica plasmei, laserilor și a fasciculelor de electroni
2004-2007	Cercetător Postdoctoral Los Alamos National Laboratory, Plasma Physics Group P-24, Los Alamos, New Mexico 87545, USA Fizica plasmei
2002-2004	Cercetător Postdoctoral University of Oxford, Department of Engineering Science, Oxford OX1 3PJ, UK Fizica plasmei
1997-2002	Asistent de cercetare și predare, doctorand University of Miami, Department of Physics, Nonlinear Dynamics Lab. & Department

	of Electrical and Computer Engineering, Optics Lab., Coral-Gables, FL 33124, USA
	Dinamica neliniară a plasmelor și controlul haosului în plasmă
1995-1997	Asistent de cercetare
	INFLPR, Str. Atomiştilor nr. 409, 077125, Măgurele-Ilfov, Romania
	Fizica laserilor

**EDUCAȚIE
ȘI FORMARE**

1997-2002	Doctorat
	University of Miami, Coral Gables, FL 33124, USA
	Fizică, Titlul tezei: Experimental phase synchronization of chaos in a plasma discharge
1995-1996	Diplomă de Studii Aprofundate (Master)
	Universitatea din București
	Optotehnică și tehnologii cu laseri și plasmă
1990-1995	Diplomă de Licență
	Universitatea din București
	Optică, plasmă, spectroscopie și laseri

**COMPETENTE
PERSONALE**

Limba maternă	română				
Alte limbi străine cunoscute	INTELEGERE		VORBIRE		SCRIERE
	Ascultare	Citire	Participare la conversație	Discurs oral	
Engleză	C2	C2	C2	C2	C2
Franceză	B1	B1	B1	B1	B1
	Niveluri: A1/A2: Utilizator elementar - B1/B2: Utilizator independent - C1/C2: Utilizator experimentat				

Competență managerială	Peste 9 ani în funcții de conducere ca șef de departamente cu peste 20 de membri în 2 institute naționale de cercetare din România
Activitate de îndrumare	-Coordonat 2 doctoranzi și 2 cercetători postdoctorali, INFLPR, 2011-2019 -Conducător de doctorat pentru 6 cercetători, ELI-NP, din 2020
Activitate științifică și managerială	100 de publicații în jurnale (ISI), proceedings de conferințe internaționale și naționale, etc. Director de proiect sau responsabil în 8 proiecte de cercetare finanțate de UEFISCDI, EURATOM, COST Hirsh index 17; Număr de citări: peste 1000 în Google Scholar
Activitate profesională	<ul style="list-style-type: none"> ▪ Inițiat domenii noi de cercetare în fizică în România: -2010: fizica plasmelor complexe (plasmă cu microparticule puternic cuplate); -2018: demonstrat pentru prima oară efectul dinamic al fasciculelor de electroni cu energie ~10 keV asupra microparticulelor; -2022: aplicarea machine learning în domeniul laserilor și plasmelor; -2023: demonstrat micro turbulența indusă cu fascicule de electroni în plasmă complexă. ▪ Referent pentru diverse jurnale: Physics of Plasmas, IEEE Transactions on Plasma Science, Plasma, Contributions to Plasma Physics, Plasma Sources Science and Technology, Plasma Physics and Controlled Fusion, Chaos, Applied Surface Science, Journal of Imaging, Vacuum,

	<p>Romanian Romanian Reports in Physics, Fusion Design and Engineering, Journal of Imaging, etc.</p> <ul style="list-style-type: none"> ▪ Referent pentru agenții finanțatoare a cercetării (USA, Belgia, Polonia, România): NSF-DOE (USA), FWO (Belgia), FONDECYT (CHILE), NCN (Polonia), UEFISCDI (România) ▪ Membru al Comitetului de Organizare al ELI-NP Autumn School , 2020, ELI-NP, Măgurele-Ilfov, România ▪ Membru al Comitetului de Organizare al Conferinței de Fizica și Aplicații ale Plasmei (CPPA) 2018-Iași, România ▪ Co-organizator cu Tom Intrator și Scott Hsu (Los Alamos National Laboratory) al Școlii de Vară de Fizică a Plasmei 2006, iunie-aug., Los Alamos National Laboratory , New Mexico ▪ Co-organizator cu Tom Intrator, Leonid Dorf, Zhehui Wang și Glen Wurden (Los Alamos National Laboratory) al Mini Conference 2005 Nano-Micro Gadgets, 15 septembrie, Santa Fe, New Mexico.
Premii și recunoaștere profesională	<ul style="list-style-type: none"> ▪ Articolul E. Molnar, D. Stutman, C. Ticoș, cu titlul “Optimizing direct laser-driven electron acceleration and energy gain at ELI-NP”- EPJD 74, 229 2020, a fost nominalizat de către European Physical Journal D în secțiunea “EPJ D Highlight”. ▪ Articolul C.M. Ticoș, D. Ticoș, J.D. Williams, cu titlul “Kinetic effects in a plasma crystal induced by an external electron beam” – Physics of Plasmas 26, 43702 (2019), a fost nominalizat de către Physics of Plasmas în secțiunea “Latest advancements in Dusty Plasmas 2020”. ▪ Finalist al concursului “Best Image and Video in Plasma Physics”, organizat de European Physical Society-Plasma Physics, iulie 2-6, 2018, Prague, Czech Republic. ▪ Articolul C.M. Ticoș, A. Scurtu, D. Ticoș, cu titlul “A pulsed "plasma broom" for dusting off surfaces on Mars”, publicat în New Journal of Physics 19, 063006/1-11(2017) a fost prezentat pe larg în: <ul style="list-style-type: none"> - Physicsworld.com, 9 iunie 2017; - Nature Physics 13, 623 (2017) în secțiunea Research Highlights; - inclus în “Highlights of 2017” collection al revistei New Journal of Physics. ▪ Premiul Radu Grigorovici al Academiei Române în anul 2014 (decernat în 2016). ▪ Premiul The Best Speaker Prize of the International Workshop on the Frontiers of Modern Plasma Physics, 14-25 iulie 2008, Abdus Salam International Center for Theoretical Physics, Trieste, Italia. ▪ Preimul Young Scientist Medal and Certificate, The Fifth International Conference on the Physics of Dusty Plasmas, 18-23 mai 2008, Ponta Delgada, Azores, Portugalia. ▪ Premiul Graduate Students Association Award, 25 apr. 2002, University of Miami, Florida, USA. ▪ Premiul 3rd prize “The Fourth” și “The Fifth Annual UM Graduate Student Research & Creativity Forum, 18 nov. 1999 și 1 mar. 2001, University of Miami, Florida, USA. ▪ Premiul Outstanding Teaching Assistant Award, 2000, Department of Physics, University of Miami, Florida, USA.
Publicații științifice în jurnale cu referenți	<p>[80] E.-M. Pavelescu, D. Ticoș, O. Ligor, C. Romanișan, A. Matei, F. Comănescu, V. Țucureanu, S.I. Spănulescu, C. Ticoș, T. Ohshima, T. Nakamura, M. Imaizumi, R.S. Goldman, A. Wakahara, K. Yamane Enhancement in photoluminescence from GaPAsN/GaP alloys by 6-MeV electrons irradiation and rapid thermal annealing Optical Materials 149, 115075 (2024).</p> <p>[79] A. Scurtu, D. Ticos, M.L. Mitu, M. Dumitru, N. Udrea, C.M. Ticoș Induced ageing of ZnS: Ag microparticles exposed to 13 keV electron beam Physica Scripta 99 (2), 025404 (2024).</p> <p>[78] R. Anirudh , R. Archibald , M. S. Asif et al., 2022 Review of Data-Driven Plasma Science IEEE Transactions on Plasma Science 51 (7), 1750 (2023).</p> <p>[77] C. Jalbă, L. Dincă, N Djourelou, C. Ticoș, A. Măgureanu, B. Diaconescu The importance of chemical shift screening of the precursors for increasing the exfoliation efficiency of the graphite layers U.P.B. Sci. Bull., Series A 85, (3), 131 (2023).</p> <p>[76] D. Ticoș, E. Constantin, M.L. Mitu, A. Scurtu, C.M. Ticoș A laboratory platform for studying rotational dust flows in a plasma crystal irradiated by a 10 keV electron beam,</p>

	<p>Scientific Reports 13 (1), 940 (2023).</p> <p>[75] A. Scurtu, D. Ticoș, M.L. Mitu, C. Diplășu, N. Udrea, C.M. Ticoș Splitting CO₂ in Intense Pulsed Plasma Jets, International Journal of Molecular Sciences 24 (8), 6899 (2023).</p> <p>[74] N. Udrea, M.L. Mitu, A. Scurtu, D. Ticoș, C.M. Ticoș Chaotic Oscillations of Vertically Aligned Microrods in a Plasma Sheath, IEEE Transactions on Plasma Science 51 (3), 835-846 (2023).</p> <p>[73] M. Galatanu, M. Enculescu, A. Galatanu, D. Ticos, M. Dumitru, C. Ticoș Microengineering Design for Advanced W-Based Bulk Materials with Improved Properties, Nanomaterials 13 (6), 1012 (2023).</p> <p>[72] R. Iovanescu, R.P. Daia, E.I. Slusanschi, C.M. Ticoș, Optimisation of particle-in-cell simulations for laser wakefield acceleration, University Politehnica of Bucharest Scientific Bulletin-series A-Applied Mathematics and Physics 85 (9), 159 (2023).</p> <p>[71] A Scurtu, D Ticoș, ML Mitu, N Udrea, CM Ticoș Stretching and Compression of Double Dusty Plasma Vortex, Crystals 13 (1), 76 (2023).</p> <p>[70] D. Ticoș, M. Galațanu, A. Galațanu, M. Dumitru, M.L. Mitu, N. Udrea, A. Scurtu, C.M. Ticoș Irradiation of W and K-Doped W Laminates without or with Cu, V, Ti Interlayers under a Pulsed 6 MeV Electron Beam, Materials 15 (3), 956 (2022).</p> <p>[69] A. Măgureanu, L. Dincă, C. Jalbă, R.F. Andrei, I. Burducea, D.G. Ghiță, V. Nastasa, M. Gugiu, T. Asavei, O. Budrigă, D. Ticoș, V. Crăciun, B. Diaconescu, C.M. Ticoș, Target characteristics used in laser-plasma acceleration of protons based on the TNSA mechanism, Frontiers in Physics 10, 727718 (2022).</p> <p>[68] I. Ouatu, B. T. Spiers, R. Aboushelbaya, Q. Feng, M. W. von der Leyen, R. W. Paddock, R. Timmis, C. Ticoș, K. M. Krushelnick, and P. A. Norreys, Ionization states for the multipetawatt laser-QED regime, Physical Review E 106, 015205 (2022).</p> <p>[67] D. Ticoș, A. Scurtu, J.D. Williams, L. Scott, E. Thomas, Jr., D. Sanford, C.M. Ticoș, Rotation of a strongly coupled dust cluster in plasma by the torque of an electron beam, Physical Review E 103, 023210 (2021).</p> <p>[66] O Budrigă, CM Ticoș Modeling the electron acceleration in relativistic channels for space irradiation applications, Plasma Physics and Controlled Fusion 62 (12), 124001 (2020).</p> <p>[65] E.-M. Pavelescu, O. Ligor, J. Occena, C. Ticoș, A. Matei, R. Gavrilă, K. Yamane, A. Wakahara, R.S. Goldman Influence of electron irradiation and rapid thermal annealing on photoluminescence emission from GaAsN_{0.5}Bi alloys, Applied Physics Letters 117 (14), 142106 (2020).</p> <p>[64] E Molnár, D Stutman, C Ticoș Optimizing direct laser-driven electron acceleration and energy gain at ELI-NP, The European Physical Journal D 74 (12), 1-12 (2020).</p> <p>[63] D. Doria, MO Cernaianu, P Ghenuche, D Stutman, KA Tanaka, C Ticos, C. A. Ur Overview of ELI-NP status and laser commissioning experiments with 1 PW and 10 PW class- lasers, Journal of Instrumentation 15 (09), C09053 (2020).</p> <p>[62] C.M. Ticoș, D. Ticoș, J.D. Williams Pushing microscopic matter in plasma with an electron beam, Plasma Physics and Controlled Fusion 62, 025003 (2020).</p> <p>[61] M. Ganciu, A. Chiroșca, A. Groza, E. Stancu, O. Stoican, D.B. Dreghici, B. Butoi, C. Ticoș, B. Cramariuc Radiation dose simulation during laser-plasma proton acceleration experiments and method to increase the measurement resolution of the proton energy spectrum, Romanian Cyber Security Journal 1 (2), 13 (2019).</p> <p>[60] D. Ticoș, A. Scurtu, M. Oane, C. Diplășu, G. Giubega, I. Călina, C.M. Ticoș Complementary dosimetry for a 6 MeV electron beam, Results in Physics 14, 102377 (2019).</p> <p>[59] C.M. Ticoș, D. Ticoș, J.D. Williams Kinetic effects in a plasma crystal induced by an external electron beam, Physics of Plasmas 26, 43702 (2019).</p> <p>[58] I.N. Mihăilescu, M. Oane, C.M. Ticoș, C. Ristoscu, M. Bădiceanu Linear Fourier Model Predictions in Case of Solids under IR FS Laser Irradiation, Journal of Lasers, Optics & Photonics 6(1), 1000194 (2019).</p>
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	<p>[57] L. Avotina, M. Lungu, P. Dinca, B. Butoi, G. Cojocaru, R. Ungureanu, A. Marcu, C. Luculescu, C. Hapenciuc, P.C. Ganea, A. Petjukevics, C.P. Lungu, G. Kizane, C.M. Ticoș, S. Antohe Irradiation of nuclear materials with laser-plasma filaments produced in air and deuterium by terrawatt (TW) laser pulses, <i>Journal of Physics D-Applied Physics</i> 51, 25302 (2018).</p> <p>[56] C. M. Ticoș, M. Galatanu, A. Galatanu, C. Luculescu, A. Scurtu, N. Banu, D. Ticoș, Cracks and nanoparticles produced on tungsten surface by dense plasma jets, <i>Applied Surface Science</i> 434, 1122-1128 (2018).</p> <p>[55] C.M. Ticoș, A. Scurtu, D. Ticoș, A pulsed "plasma broom" for dusting off surfaces on Mars, <i>New Journal of Physics</i> 19, 063006 (2017).</p> <p>[54] M. G. Florescu, O. G. Dului, D. Pantazi, C. M. Ticoș, D. Sporea, R. Vasilache, V. Ionescu, M. Oane, Radiological safety assessment for the experimental area of a hyper-intense laser with peak-power of 1 PW—CETAL, <i>Radiation Protection Dosimetry</i> 175 (1), 104-109 (2017).</p> <p>[53] M. Oane, I.N. Mihăilescu, A. Buca, C. Ristoscu, G. Popescu-Pelin, C.M. Ticoș Two-temperature model using the Cattaneo-Vernotte equation in the Anisimov-Nolte model for application in laser additive manufacturing, <i>Digest Journal of Nanomaterials and Biostructures</i> 12, 1247-1257 (2017).</p> <p>[52] N. Banu, C.M. Ticoș, Precession of cylindrical dust particles in the plasma sheath, <i>Physics of Plasmas</i> 22 (10), 103704 (2015)</p> <p>[51] O. Budriga, E. D'Humieres, C.M. Ticoș Simulations for protons and electrons acceleration with the 1 PW laser pulse from CETAL facility, <i>Romanian Reports in Physics</i> 67 (4), 1271 (2015).</p> <p>[50] C.M. Ticoș, A. Scurtu, D. Toader, N. Banu, Experimental demonstration of Martian soil simulant removal from a surface using a pulsed plasma jet, <i>Review of Scientific instruments</i> 86, 033509 (2015).</p> <p>[49] N. Iacob, G. Schinteie, P. Palade, C.M. Ticoș, V. Kuncser Stepped heating procedure for experimental SAR evaluation of ferrofluids, <i>Material Letters E</i> 38, 57 (2015).</p> <p>[48] D. Toader, M. Oane, C.M. Ticoș, Collimated electron beam accelerated at 12 kV from a Penning discharge, <i>Review of Scientific instruments</i> 86, 013301 (2015).</p> <p>[47] C.M. Ticoș Highly accelerated microparticles in plasma flows, <i>Romanian Reports in Physics</i> 67 (3), 1018 (2015).</p> <p>[46] M. Oane, A. Peled, D. Toader, P. Mursa and C.M. Ticoș Semi-analytical solution of the thermal field distribution in a semiconductor under simultaneous irradiation by three laser fields, <i>Lasers in Engineering</i> 32 (3-4), 161 (2015).</p> <p>[45] M. Oane, I.N. Mihăilescu, C.M. Ticoș, N. Banu, L.M. Mitu, I. Negut, N. Mihăilescu, D. Ticos General two-photon non-Fourier model for weak laser-solid interaction, <i>Journal of Intense Pulsed Lasers and Applications in Advanced Physics</i> 5 (1), 5-8 (2015).</p> <p>[44] M. Oane, D. Toader, N. Iacob, C. M. Ticoș Thermal phenomena induced in a small tungsten sample during irradiation with a few MeV electron beam: Experiment versus simulations, <i>Nuclear Instruments and Methods in Physics Research B</i> 337, 17-20 (2014).</p> <p>[43] M. Oane, D. Toader, I. Neguț, I.N. Mihăilescu, N. Mihăilescu, A. Visan, C. M. Ticoș Thermal phenomena induced in a small C sample under irradiation with a few MeV electron beam by analogy with the laser-metal interaction formalism, <i>Journal of Intense Pulsed Lasers and Applications in Advanced Physics</i> 4, 65-70 (2014).</p> <p>[42] C.P. Lungu, C. Porosnicu, I. Jepu, M. Lungu, A. Marcu, C. Luculescu, C. Ticoș, A. Marin, C.E.A. Grigorescu, The behavior of W, Be and C layers in interaction with plasma produced by terawatt laser beam pulses, <i>Vacuum</i> 110, 207-212 (2014).</p> <p>[41] M. Oane, D. Toader, N. Iacob, C. M. Ticoș Thermal phenomena induced in a small graphite sample during irradiation with a few MeV electron beam: Experiment versus theoretical simulations, <i>Nuclear Instruments and Methods in Physics Research B</i> 318, 232–236 (2014).</p>
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