

PERSONAL INFORMATION

Mr. Claudiu Hapenciu



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Sex: Male | Date of birth: 10/07/1970 | Nationality: Romanian | Marital Status: Married

WORK EXPERIENCE

2020-Present

**Scientific Researcher Rank III (CS III)**

Lasers Department, National Institute for Lasers, Plasma and Radiation Physics, Măgurele, Romania

- Development of new measurement techniques for the thermoelectric properties of nanostructured materials
- Writing articles in peer-reviewed journals, writing national and international projects

2014 – 2020

**Scientific Researcher (CS)**

Lasers Department, National Institute for Lasers, Plasma and Radiation Physics, Măgurele, Romania

- The fundamentals of heat transfer at micro -nano scale and thermoelectrics. Development of new experimental techniques for thermal conductivity, Seebeck coefficient and electrical conductivity measurement in bulk and thin film materials. The study of heat transfer process in fluids and nanofluids. Organic thermoelectrics, synthesis and characterisation.
- Simulation and modelling of laser cladding process
- Gas sensors, experimental development and measurement
- Writing articles in peer-reviewed journals, writing national and international projects

2008 – 2009

**Teaching Assistant (TA)**

Physics Department, Boston College, Boston, MA, USA

- Keeping office hours with students
- Homeworks and Exams grading
- Keeping recitation seminars with students

2002 – 2007

**Research Assistant (RA)**

Mechanical Aerospace and Nuclear Engineering Department, Rensselaer Polytechnic Institute, Troy, NY, USA

- Developing new techniques for thermoelectric properties measurement of nanostructured materials
- Scanning laser thermometry (SLTM)
- Harman techniques
- AFM SThM methods for thermoelectric properties characterization of thin films
- CleanRoom user of: Plasmatherm, WetBench, Photolithography, E-beam, AFM, SEM, Alfa-step, Dektak-profilometer
- Scientific communications through conferences and workshops

1998-2001

**Scientific Researcher (CS)**

Quantum Electronic Solid State Laboratory, INFLPR, Magurele, Romania

- The study of energy transfer processes in Er:YAG crystals, modelling and measurements
- Laser emission at 3 microns modelling and simulation in Er:YAG crystals
- The study of laser emission from YLF crystals, modelling and simulation
- The study of langasite crystals for laser applications

1996-1998 **Physicist Engineer**

Safety Environmental Laboratory, Steel Factory, "SIDEX", Galati, Romania  
 Developing theoretical method for pollutants dispersion in air from the Steel Factory.  
 Measurements in situ of several kind of gaseous and solid pollutants.

1995 – 1996 **Research assistant (ACS)**

Quantum Electronic Solid State Laboratory, INFLPR, Magurele, Romania

- The study of the laser emission at 3 microns of Er: YAG crystals by numerical simulation, absorption and emission spectra measurement, maintenance of the solid state lasers systems in the lab

MAIN RESEARCH INTERESTS

- Fundamentals and modelling of heat transfer in thin films and other nanostructures
- Synthesis and thermoelectric characterization of nanostructured materials
- Development of experimental techniques for thermal conductivity measurements in thin films
- Organic thermoelectrics, flexible thermoelectric generators
- Gas sensors
- Laser cladding process fundamentals and modelling

EDUCATION AND TRAINING

September 2004 – December 2007

**Doctoral program (Ph.D.) in Mechanical Engineering**

Mecahnical Aerospace and Nuclear Engineering department, Rensselaer Polytechnic Institute , Troy, NY, USA

- PhD thesis: "*Scanning hot probe technique for nanostructured films thermoelectric properties characterzitaion*"

January 2002 – May 2004

**Master program (M.S.) in Mechanical Engineering**

Mecahnical Aerospace and Nuclear Engineering department, Rensselaer Polytechnic Institute , Troy, NY, USA

- Dissertation thesis: "*Electrical properties of self-assembled multilayers of Au and Ag nanoparticles*"

September 1990 – May 2005

**Bachelor program (B.S.) in Physics**

University of Bucharest, Faculty of Physics, Bucharest – Măgurele, Romania

- Specialization: "Optotechnics and Lasers"
- Diploma thesis: "*Computerized measurement and simulation of colors*"

PERSONAL SKILLS

Mother tongue(s) Romanian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	B2	B2	B1	A2	A1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages

Communication and writing skills	<p>Excellent communication and scientific dissemination skills acquired through:</p> <ul style="list-style-type: none"> <li>▪ Scientific presentations and laboratory/seminar sessions held</li> <li>▪ Attendance to conferences and workshops</li> <li>▪ Writing scientific reports and peer-reviewed papers</li> </ul>
Organizational Skills	<ul style="list-style-type: none"> <li>• Organising Committee member of the “10th International Conference on Photoexcited Processes and Applications”, 29th August – September 2nd, Brasov, Romania, 2016</li> </ul>
User	<p>MCR CleanRoom devices: deposition, etching, photolithography, wet chemistry AFM-contact, noncontact, tapping mode on TT-WorkShop AFM - 50 microns scanner, Imaging, Force spectroscopy, Scanning Thermal Microscopy SEM imaging</p>
Analytical thinking	<p>Problem solving and managerial skills acquired through:</p> <ul style="list-style-type: none"> <li>▪ Experiments planning; Data analysis; Scientific writing; Seminars</li> </ul>
Mentoring skills	<p>Acquired through:</p> <ul style="list-style-type: none"> <li>▪ Laboratory sessions to bachelor and master students (2002-2007)</li> <li>▪ Supervision of new bachelor students in the group (2004-2007)</li> </ul>
Computer skills	<ul style="list-style-type: none"> <li>▪ Proficient user of the Microsoft products (Windows, Office) , Adobe Photoshop</li> <li>▪ Origin, Kaleida Graph</li> <li>▪ Visual Basic 6, Mathematica 11</li> <li>▪ COMSOL</li> <li>▪ Matlab, Mathcad, C++</li> <li>▪ LabView 2016</li> </ul>
Scholarships and awards	<ul style="list-style-type: none"> <li>▪ Research Assistantship obtained for MS and PhD at Rensselaer Polytechnic Institute, Troy, NY, USA</li> <li>▪ Diploma of Silver Medal and Silver Medal at Euroinvent, Iasi, Romania, May 16-18, 2019, for “Subsidiary contracts as a source of intellectual property and areas of application of laser cladding of materials by technological transfer: New advanced surface coating technologies using high power laser beam to increase reliability and performance of materials – PRELAM” by INFLPR: M. Besenyeyi, M. Badiceanu , <b>C. Hapenciu</b>, A. Ionita, I.N. Mihailescu, C. Mihailescu, I. Negut , M. Oane, M. Opran, G. Popescu-Pelin, E. Popovici, C. Ristoscu, OPTOELECTRONICA 2001: T. Necsoiu, E.M. Stanciu , L. Ghidan, A. Enuica, B. Comanescu, I.R. Popovici, M. Vlad</li> <li>▪ Diploma of Gold Medal at the XXII edition of the International Salon of Scientific Research Innovation and Inventics for „ DC Scanning Thermal Microscopy for Thermal Conductivity Measurement of Nanomaterials with Submicronic Spatial Resolution”, authors: C. Hapenciu, A. Visan, G. Popescu-Pelin, M. Oane and I. N. Mihailescu, 15-17 October 2025, HUB UTCN, Cluj-Napoca.</li> </ul>
Team member at national and international projects	<ul style="list-style-type: none"> <li>▪ POC G 135/23.09.2016: “New advanced surface coating technologies using high power laser beam to increase reliability and performance of materials – PRELAM”;</li> <li>▪ NATO: Science for Peace and Security Programme project no. G4890: “Energy - efficient decontamination by UV &amp; cold plasma using metamaterials”;</li> </ul>
Scientific Publications and Conferences	<ul style="list-style-type: none"> <li>▪ For a full list of scientific papers and Conference attendance please see Annex I.</li> </ul>

Scientific reviewer

- *International Journal of Fluid Mechanics and Thermal Sciences, Thin Solid Films, International Journal of Heat and Mass Transfer*

A handwritten signature in blue ink on a white background. The signature is cursive and appears to read "Hapenciu".

## SCIENTIFIC OUTPUT

**Reviews, proceedings and research papers**

1. **C. L. Hapenciu**, M. Oane, A. Visan, C. Ristoscu, I. Urzica, A. Stochioiu, M. Dumitru, S. Anghel, T. Borca-Tasciuc, I. N. Mihailescu, "Hot probe technique for thin films Seebeck coefficient measurement", *Results in Engineering*, vol. 23, 2024 102789.
2. Negut, I; Ristoscu, C; Tozar, T; Dinu, M; Parau, AC; Grumezescu, V; **Hapenciu, C**; Popa, M; Stan, MS; Marutescu, L; Mihailescu, IN; Chifiriuc, MC; "Implant Surfaces Containing Bioglasses and Ciprofloxacin as Platforms for Bone Repair and Improved Resistance to Microbial Colonization"; *PHARMACEUTICS JUN* (2022).
3. **C. L. Hapenciu**, I. Negut, A. Visan, T. Borca-Tasciuc and I. N. Mihailescu, "The effect of the contact point asymmetry on the accuracy of thin films thermal conductivity measurement by scanning thermal microscopy using Wollaston probes", *Journal of Applied Physics*, 131, 094902 (2022); <https://doi.org/10.1063/5.0069273>
4. Gianina Popescu-Pelin, Carmen Ristoscu, Liviu Duta , Iuliana Pasuk , George E. Stan, Miruna Silvia Stan , Marcela Popa, Mariana C. Chifiriuc , **Claudiu Hapenciu** , Faik N. Oktar , Anca Nicarel and Ion N. Mihailescu; "Fish Bone Derived Bi-Phasic Calcium Phosphate Coatings Fabricated by Pulsed Laser Deposition for Biomedical Applications"; *Mar. Drugs* 2020, 18, 623; doi:10.3390/md18120623
5. Muhammad Arif Mahmood, Andrei C. Popescu, **Claudiu Liviu Hapenciu**, Carmen Ristoscu, Anita Ioana Visan, Mihai Oane , Ion N. Mihailescu. Estimation of clad geometry and corresponding residual stress distribution in laser melting deposition: analytical modeling and experimental correlations *The International Journal of Advanced Manufacturing Technology* volume 111, pages77–91(2020)
6. Irina Negut, Laura Floroian, Carmen Ristoscu , Cristian N. Mihailescu, Julia Claudia Mirza Rosca , Tatiana Tozar, Mihaela Badea, Valentina Grumezescu, **Claudiu Hapenciu** and Ion N. Mihailescu, "Functional Bioglass—Biopolymer Double Nanostructure for Natural Antimicrobial Drug Extracts Delivery", *Nanomaterials* 2020, 10(2), 385; <https://doi.org/10.3390/nano10020385>
7. **C. L. Hapenciu**, I. Negut, T. Borca-Tasciuc and I. N. Mihailescu, "A steady-state hot-wire method for thermal conductivity measurement of fluids", *International Journal of heat and mass transfer*, 134 (2019) 993-1002. <https://doi.org/10.1016/j.ijheatmasstransfer.2019.01.098>
8. Liga Avotina, Mihail Lungu, Paul Dinca, Bogdan Butoi, Gabriel Cojocar, Razvan Ungureanu, Aurelian Marcu, Catalin Luculescu, **Claudiu Hapenciu**, Paul C Ganea, Aleksandrs Petjukevics, Cristian P Lungu, Gunta Kizane, C M Ticos and Stefan Antohe, "Irradiation of nuclear materials with laser-plasma filaments produced in air and deuterium by terrawatt (TW) laser pulses", *J. Phys. D: Appl. Phys.* **51** 025302, 2018.
9. Mihailescu, Ion; Bociaga, Dorota; Popescu-Pelin, Gianina; Stan, George; Duta, Liviu; Socol, Gabriel; Chifiriuc, Carmen; Bleotu, Coralia; Lazar, Veronica; Husanu, Marius; Zgura, Irina; Miculescu, Florin; Negut, Irina; **Hapenciu, Claudiu**, "Optimum Silicon doping of Carbon coatings by pulsed laser technique for superior functional biomedical surfaces fabrication", *Biofabrication*. 2017 Jun 1;9(2):025029. doi: 10.1088/1758-5090/aa7076.
10. **C.L. Hapenciu**, T. Borca-Tasciuc, I.N. Mihailescu, "The relationship between the thermoelectric generator efficiency and the device engineering figure of merit  $Z_{d,eng}$ . The maximum efficiency  $\eta_{max}$ ."; *AIP Advances* **7**, 045007 (2017); doi: <http://dx.doi.org/10.1063/1.4979328>
11. Mihailescu I.N.; Bociaga D.; Socol G.; Stan G.E.; Chifiriuc M.C.; Bleotu C.; Husanu M.A.; Popescu-Pelin G.; Duta L.; Luculescu C.R.; Negut I.; **Hapenciu C.**; Besleaga C.; Zgura I.; Miculescu F.; "Fabrication of antimicrobial silver-doped carbon structures by combinatorial pulsed laser deposition"; *International Journal of Pharmaceutics*; 515 (1–2) 592–606 (2016)
12. Bazgan S.; Ristoscu C.; Negut I.; **Hapenciu C.**; Turcan M.; Ciobanu N.; Mihailescu I.N.; Enaki N.; "Propagation of UV radiation through meta-materials and its application in bio decontamination"; *Romanian Reports in Physics*, 67(4) (2015) In Press
13. Arup Purkayastha, Abhishek Jain, **Claudiu Hapenciu**, Rok Buckley, Binay Singh, C. Karthik, Rutvik J. Mehta, Theodorian Borca-Tasciuc, and Ganpati Ramanath "Synthesis and Thermoelectric Properties of Thin Film Assemblies of Bismuth Telluride Nanopolyhedra", *Chem. Mater.*, 2011, 23 (12), pp 3029–3031
14. Zhang Y, **Hapenciu CL**, Castillo EE, Borca-Tasciuc T, Mehta RJ, Karthik C, Ramanath G. A microprobe technique for simultaneously measuring thermal conductivity and Seebeck coefficient of thin films *Applied Physics Letters*. 96. DOI: 10.1063/1.3300826
15. Castillo EE, **Hapenciu CL**, Borca-Tasciuc T. Thermoelectric characterization by transient Harman method under nonideal contact and boundary conditions. *The Review of Scientific Instruments*. 81: 044902. PMID 20441361 DOI: 10.1063/1.3374120
16. Georgescu S., Lupei V., Petraru A., **Hapenciu C.**, Florea C., Naud C., Porte C., "Excited-state- absorption in low concentrated Er: YAG crystals for pulsed and cw pumping", *J. LUMIN.* 93 (4): 281-292 AUG 2001

17. S. Georgescu, V. Lupei, **C. Hapenciuc**, "Giant pulse generation in 3- $\mu$ m erbium lasers", *Balkan Phys. Lett.*, **7** (1), 62-65 (1999)
18. Georgescu S., Lupei V., Petraru A., **Hapenciuc C.** "Up-conversion processes in erbium doped materials" *LUMINESCENT MATERIALS VI*, Editors: Ronda C, Welker T, ELECTROCHEMICAL SOCIETY SERIES, 97 (29), 409-419, 1998
19. S. Georgescu, V. Lupei, and **C. Hapenciuc**, "On the efficiency of Q-switched 3- $\mu$ m erbium laser" , *Romanian Journal of Physics*, **43**, 147 (1998)
20. **Hapenciuc CL**, Khan FJ, Borca-Tasciuc T, Wang GC. Development of experimental techniques for thermoelectric properties characterization of low-dimensional structures *Materials Research Society Symposium - Proceedings*. 793: 181-186.
21. **Hapenciuc CL**, Borca-Tasciuc T. Development of a scanning hot probe technique for thin-film thermoelectric properties characterization *American Society of Mechanical Engineers, Heat Transfer Division, (Publication) Htd.* 376: 697-701. DOI: [10.1115/IMECE2005-82626](https://doi.org/10.1115/IMECE2005-82626)
22. **Claudiu, L. Hapenciuc**, Fazeel J. Khan<sup>1</sup>, Theodorian Borca-Tasciuc, and Gwo-Ching Wang, "Development of experimental techniques for thermoelectric properties characterization of low- dimensional structures," *Mat. Res. Soc. Symp. Proc. Vol. 793*, (2004)
23. Borca-Tasciuc T, **Hapenciuc CL**, Wei B, Vajtai R, Ajayan PM. Anisotropic thermal diffusivity of aligned multiwalled carbon nanotube arrays *Asme International Mechanical Engineering Congress and Exposition, Proceedings*. 5: 305-309. DOI: [10.1115/IMECE2002-39576](https://doi.org/10.1115/IMECE2002-39576)
24. Borca-Tasciuc T, Wei B, Khan FJ, Vajtai R, **Hapenciuc C. L.**, Ajayan PM. Experimental investigation of temperature annealing effect on thermophysical properties of carbon nanotube arrays *American Society of Mechanical Engineers, Heat Transfer Division, (Publication) Htd.* 374: 349-354. DOI: [10.1115/IMECE2003-42199](https://doi.org/10.1115/IMECE2003-42199)
25. Georgescu S., **Hapenciuc C.**, Florea C. "On the intrinsic oscillation threshold of 3- $\mu$ m erbium lasers" 6th Conference on Optics (ROMOPTO 2000), SEP 04-07, 2000 SPIE Vol. 4430, pp. 44-51 (2001)
26. Georgescu S., **Hapenciuc C.** "A simple method for characterisation the up-conversion processes governing three-micron generation in concentrated erbium crystals", 6th Symposium on Optoelectronics (SIOEL'99), SEP 22-24, 1999, SPIE Vol. 4068, pp. 284-289 (2000)
27. Georgescu S., Lupei V., **Hapenciuc C.** "Q-switch regime of 3-  $\mu$ m erbium lasers", 5th Conference on Optics (ROMOPTO 97), SEP 09-12, 1997, SPIE Vol. 3405, pp. 2-9 (1998)

#### Conference attendance

1. **C. Hapenciuc**, I. Negut, A. Visan, T. Borca-Tasciuc and I. N. Mihailescu, "Improving the SThM accuracy in measuring thin films and bulk materials", NSFE 15-17 september 2021, Freiburg, Germany (Contributed talk)
2. **C. Hapenciuc**, I. Negut, A. Visan, T. Borca-Tasciuc and I. N. Mihailescu , "Quantitative evaluation of thermal conductivity measurement error in Scanning Thermal Microscopy induced by an asymmetry in the probe-sample contact point", NSFE 15-17 september 2021, Freiburg, Germany (poster)
3. **C. Hapenciuc**, I. Negut, A. Visan, T. Borca-Tasciuc and I. N. Mihailescu, "Influence of the contact point asymmetry on thermal conductivity measurement precision in Scanning Thermal Microscopy", EMRS- Spring Meeting, S13-Ref.2, Strasbourg, France 2021 (poster)
4. Y. Zhang, **C. L. Hapenciuc**, E. Castillo, T. Borca - Tasciuc, R. J. Mehta, K. Chinnathambi, G. Ramanath, "Simultaneous measurement of thermal and thermoelectric properties of nanostructured materials using scanning hot probe technique," EMC - TMS Annual Electronic Materials Conference and Exhibition, 2009, Pennsylvania State University, University Park, PA
5. **Claudiu Hapenciuc**, Theodorian Borca-Tasciuc, Arup Purkayastha, Ganapathiraman Ramanath, "Thermoelectric properties characterization of nanostructured thin-films " *American Society of Mechanical Engineering 2nd Energy Nanotechnology International Conference – Final Program*, September 5-7, 2007, Santa Clara University, Santa Clara, CA
6. **C. L. Hapenciuc**, T. Borca-Tasciuc, A. Purkayastha, G. Ramanath, "Thermoelectric Transport Measurements in Thin Films using a Scanning Hot Probe Technique," 2007 Materials Research Society Conference, Spring Meeting, San Francisco, CA.
7. R. P. Buckley, M. I. Cane, **C. L. Hapenciuc**, E. E. Castillo, and T. Borca-Tasciuc, "Investigation of a Transient Technique for Thermoelectric Characterization of Nano-Structured Films," 2007 MRS Fall Meeting, Boston, MA. (poster)
8. **Claudiu L. Hapenciuc**, Eduardo Castillo, T. Borca-Tasciuc, A. Purkayastha, and G. Ramanath, "Thermoelectric Characterization of Nanostructured Thin Films by a Scanning Hot Probe Technique," 2007 MRS Fall Meeting, Boston, MA. (poster)
9. A. Purkayastha, G. Pattanaik, **C.L. Hapenciuc**, T. Borca-Tasciuc, and G. Ramanath, "Directed synthesis and properties of thermoelectric nanorods and assemblies for cooling hotspots in nanodevice wiring," 2007 Workshop on Interconnects for Hybrid and Monolithic Integration,

Albany, NY. (poster)

10. **Hapenciuc, C. L.**, Borca-Tasciuc, T., "The Scanning hot probe technique for thermoelectric transport characterization," 2006, ASME International Mechanical Engineering Congress and Exposition, Nov. 5-10 2006, Chicago IL, CDROM
11. S. Kim, **C. L. Hapenciuc**, Y. Son, A. Jain, A. Purkayastha, G. Ramanath, and T. Borca-Tasciuc, "Thermoelectric transport in bismuth telluride nanostructured films," 2006 Energy Nanotechnology International Conference, Massachusetts Institute of Technology, Boston, MA. (poster)
12. **C. L. Hapenciuc**, A. Jain, T. Borca-Tasciuc, A. Purkayastha, G. Ramanath, "Thermoelectric Transport Measurements of Bi<sub>2</sub>Te<sub>3</sub> Nanostructured Films using a Scanning Hot Probe Technique," Materials Research Society Conference, Symposium F: Materials and Technologies for Direct Thermal-to-Electric Energy Conversion, Fall Meeting, 28 nov.-2 dec. 2005, Boston, MA.
13. **C. Hapenciuc**, A. Kumar, G. Ramanath, and T. Borca-Tasciuc, "Electrical Transport in Au/Ag Nanoparticle Films," 2004 MRS Fall Meeting, Boston MA. (poster)
14. Theodorian Borca-Tasciuc, **Claudiu Liviu Hapenciuc**, Rensselaer Polytechnic Institute, Dept. of Mechanical, Aerospace and Nuclear Engineering, Troy, NY; Bingqing Wei, Robert Vajtai, and Pulickel M. Ajayan, Rensselaer Polytechnic Institute, Dept. of Materials Science and Engineering, Troy, NY. "Anisotropic thermal transport in carbon nanotube arrays", MRS, Symposium S: Nanoscale Thermal Transport-From Fundamentals to Devices, 21-25 april, 2003, San Francisco, CA
15. S. Georgescu, V. Lupei, **C. Hapenciuc**, "Infrared pumped upconversion emission in low concentrated Er:YAG crystals", Int. Conf. on Photonic Materials for 21<sup>st</sup> century, Lyon-France
16. S. Georgescu, V. Lupei, **C. Hapenciuc**, "Q-switching of 3  $\mu\text{m}$  Er:YAG laser", Int. Conf. on f-elements ICFE3, Paris-France (1997), paper P5-15
17. S. Georgescu, V. Lupei, A. Petraru, **C. Hapenciuc**, "Spectroscopy of high energy levels of Er<sup>3+</sup> in YAG, excited by upconversion", Int. Conf. on f-elements ICFE3, Paris-France (1997), paper P2-43
18. S. Georgescu, V. Lupei, A. Petraru, **C. Hapenciuc**, "Upconversion fluorescence of Er:YAG crystals under 532 nm pumping", European Conference on Quantum Electronics EQEC'96, Sept. 1996, Hamburg, Germany, Techn. Digest, p. 110, paper QWD 11