



PERSONAL INFORMATION

Mr. Claudiu Hapenciu



 National Institute for Lasers, Plasma and Radiation (INFLPR)
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Sex: Male | Date of birth: 10/07/1970 | Nationality: Romanian | Marital Status: Married

WORK EXPERIENCE

Jan. 2014 - present

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
- Gas sensors characterisation
- Laser cladding process fundamentals and modeling

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

Excellent communication and scientific dissemination skills acquired through:

- Many scientific presentations and laboratory/seminar sessions held
- Several attendances to conferences and workshops
- Writing of various scientific reports and peer-reviewed publications

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| Organizational Skills | <ul style="list-style-type: none"> • Organising Committee member of the “10th International Conference on Photoexcited Processes and Applications”, 29th August – September 2nd, Brasov, Romania, 2016 |
| Analytical thinking | <p>Problem solving and managerial skills acquired through:</p> <ul style="list-style-type: none"> ▪ Experimental planning; Data analysis; Scientific writing; Recitations |
| Mentoring skills | <p>Acquired through:</p> <ul style="list-style-type: none"> ▪ Laboratory sessions to bachelor and master students (2002-2007) ▪ Supervision of new bachelor students in the group (2004-2007) |
| Computer skills | <ul style="list-style-type: none"> ▪ Proficient user of the Microsoft products (Windows, Office) , Adobe Photoshop ▪ Origin (OriginLab); Kaleida Graph ▪ Visual Basic 6, Wolfram Mathematica 11 ▪ COMSOL, Abaqus ▪ Matlab, Mathcad, C++, Delphi ▪ LabView 2016 |
| Scholarships and awards | <ul style="list-style-type: none"> ▪ Research Assistantship obtained for MS and PhD at Rensselaer Polytechnic Institute, Troy, NY, USA ▪ 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. Besenyei, M. Badiceanu , C. Hapenciuc, 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 |
| Team member at national and international projects | <ul style="list-style-type: none"> ▪ POC G 135/23.09.2016: “New advanced surface coating technologies using high power laser beam to increase reliability and performance of materials – PRELAM”; ▪ NATO: Science for Peace and Security Programme project no. G4890: “Energy - efficient decontamination by UV & cold plasma using metamaterials”; |
| Scientific Publications and Conferences | <ul style="list-style-type: none"> ▪ For a full list of scientific papers and Conference attendace please see Annex I. |
| Scientific reviewer | <ul style="list-style-type: none"> ▪ <i>International Journal of Fluid Mechanics and Thermal Sciences, Thin Solid Films</i> |



SCIENTIFIC OUTPUT

 Reviews, proceedings and research papers (*relevant papers and Conferences for the project are highlighted*)

1. **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>
2. Liga Avotina, Mihail Lungu, Paul Dinca, Bogdan Butoi, Gabriel Cojocaru, 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.
3. 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.
4. **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 η_{max} ."; *AIP Advances* **7**, 045007 (2017); doi: <http://dx.doi.org/10.1063/1.4979328>
5. 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)
6. 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
7. 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
8. 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
9. 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
10. 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
11. S. Georgescu, V. Lupei, **C. Hapenciu**, "Giant pulse generation in 3- μ m erbium lasers", *Balkan Phys. Lett.*, **7** (1), 62-65 (1999)
12. Georgescu S., Lupei V., Petraru A., **Hapenciu C.** "Up-conversion processes in erbium doped materials" *LUMINESCENT MATERIALS VI*, Editors: Ronda C, Welker T, ELECTROCHEMICAL SOCIETY SERIES, 97 (29), 409-419, 1998
13. S. Georgescu, V. Lupei, and **C. Hapenciu**, "On the efficiency of Q-switched 3- μ m erbium laser", *Romanian Journal of Physics*, 43, 147 (1998)
14. **Hapenciu 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.
15. . Borca-Tasciuc T, **Hapenciu 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)
16. Georgescu S., **Hapenciu C.**, Florea C. "On the intrinsic oscillation threshold of 3- μ m erbium lasers" 6th Conference on Optics (ROMOPTO 2000), SEP 04-07, 2000 SPIE Vol. 4430, pp. 44-51 (2001)
17. Georgescu S., **Hapenciu 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)
18. Georgescu S., Lupei V., **Hapenciu C.** "Q-switch regime of 3- μ m erbium lasers", 5th Conference on Optics (ROMOPTO 97), SEP 09-12, 1997, SPIE Vol. 3405, pp. 2-9 (1998)

Conference attendance

1. 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
2. **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
3. **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.
4. 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)
5. **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)
6. 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)
7. **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
8. 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)
9. **C. L. Hapenciuc**, A. Jain, T. Borca-Tasciuc, A. Purkayastha, G. Ramanath, "Thermoelectric Transport Measurements of Bi₂Te₃ 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.
10. **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)
11. **Claudiu, L. Hapenciuc**, Fazeel J. Khan¹, 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)
12. **C. Hapenciuc**, A. Kumar, G. Ramanath, and T. Borca-Tasciuc, "Electrical Transport in Au/Ag Nanoparticle Films," 2004 MRS Fall Meeting, Boston MA. (poster)
13. 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)
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 21st century*, Lyon-France
16. S. Georgescu, V. Lupei, **C. Hapenciuc**, "Q-switching of 3 μ 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 Er³⁺ 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