



Ana Maria Mihaela Gherman

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● WORK EXPERIENCE

2015 – CURRENT Cluj-Napoca, Romania

SCIENTIFIC RESEARCHER NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT OF ISOTOPIC AND MOLECULAR TECHNOLOGIES (INCDTIM)

Research activity:

- Develop a deep neural network to characterize ultrashort laser pulses from frequency resolved optical gating spectrograms.
- Develop an artificial neural network that predicts the expected output of high-order harmonic generation (HHG) process
- Develop an artificial neural network that predicts the dimension of gold nanoparticles that are generated in polymer thick film using a direct light writing method
- Develop a mathematical model for ELI-NP laser pulse transport and the coherent combining of two ultra short laser pulses
- Model gold nanoparticle optical properties
- Model the heat generation and heat transfer in laser irradiated gold nanoparticles
- Model the electric field enhancement in structures that contain gold nanoparticles

● EDUCATION AND TRAINING

2014 – 2018 Cluj-Napoca, Romania

PHD Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering, Chemical Engineering Depart

PhD thesis: *Artificial Neural Network Modelling of Parametrized Photo-Induced Generation of Gold Nanoparticles and their Temperature Dynamics*

Research within the PhD:

- Developed an artificial neural network (ANN) that is capable to predict the gold nanoparticle (AuNP) size, based on the most important process parameters
- Determined, based on the ANN, the influence of the process parameters on the AuNP size
- Modelled the thermal behaviour of nanosecond laser irradiated gold nanoparticles
 - Studied the influence of different AuNPs arrangements on the system's temperature evolution in time and space
 - Studied the influence of near-field interactions for different AuNP arrangements on the system's temperature evolution in time and space
 - Studied the influence of AuNPs distance on the AuNP generated heat

The modelling was done using Matlab and Comsol Multiphysics software

2012 – 2014 Cluj-Napoca, Romania

MASTERS DEGREE Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering, Advanced Chemical and Proces

Masters thesis: Neural network modeling of the parametrized gold nanoparticles generation through a photo-induced process

Studied subjects: Physical Chemistry, Advanced Process Automatization, Mathematical Modeling of Processes and Artificial Intelligence

Bachelor thesis: Mathematical modeling of glucose metabolism at micro and macro levels

Studied subjects: Biochemistry, Drugs Biotechnology, Programming and computer use, Process Optimization

LANGUAGE SKILLSMother tongue(s): **ROMANIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	B2
FRENCH	A1	A1	A1	A1	A1

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user***DIGITAL SKILLS**

Programming, MATLAB | Comsol MultiPhysics | Ansys Lumerical

ADDITIONAL INFORMATION**CONFERENCES AND SEMINARS**

Conferences A.M.M Gherman, I. Toth, K. Kovacs, V. Tosa, Convolutional neural network for randomly shaped ultrashort pulse characterization, Processes in Isotopes and Molecules Conference, 19-22 Septembrie 2023, Cluj-Napoca, Romania.

A.M.M Gherman, K. Kovacs, V. Tosa, N. Tosa, M.V. Cristea, "Artificial Neural Networks - applications in modeling physical and chemical processes", Grid, Cloud & High Performance Computing in Science, 17-19 Octombrie 2018, Cluj-Napoca.

A.M.M Gherman, N.Tosa, N.D Dadarlat, V. Tosa, M.V. Cristea, P.S. Agachi, "Nanosecond Laser Photo-Induced Heating of Gold Nanoparticles Embedded in a Polymer Matrix - the Influence of Interface Conductance", Processes in Isotopes and Molecules Conference, 27-29 Septembrie 2017, Cluj-Napoca, Romania.

A.M.M. Gherman, V.Tosa, N. Tosa, P.S Agachi, "Near field effects and temperature dynamics of laser irradiated gold nanoparticles", 15th UK Heat Transfer Conference, 4-5 Septembrie 2017, London, UK, Proceeding Paper și Poster

A.M.M.Gherman, N.Tosa, D.Dadarlat, M.Cristea, V.Tosa, P.S. Agachi, "Time Dependent Temperature Evolution in Laser Irradiated Gold Nanoparticles Doped Matrix", Applied Nanotechnology and Nanoscience International Conference, 5-7 Noiembrie 2015 - Poster

A.M.M.Gherman, N.Tosa, M.Mircea, "Neural network modeling of the parameterized gold nanoparticles generation through photo-induced process", International Conference on Physics of Advanced Materials, Septembrie 2014 - Poster

ORGANISATIONAL SKILLS**Organisational skills** Organized and ambitious

Ability to grasp new concepts and learn new things quickly

Ability to communicate and work efficiently in teams

LIST OF ARTICLES**List of articles**

1. I. Tóth, **A. M. M. Gherman**, K. Kovács, W. Cho, H. Yun and V. Tosa, *Reconstruction of Femtosecond Laser Pulses from FROG Traces by Convolutional Neural Networks*, Photonics, 10 (**2023**), 1195;
2. **A. M. M. Gherman**, A. Vladescu, A. E. Kiss, C. Farcau*, *Plasmonic photothermal heating of gold nanostars in a real-size container: multiscale modelling and experimental study*, Nanotechnology, 31 (**2020**), 1-11;

3. **A. M. M. Gherman**, A. Vladescu, A. E. Kiss, C. Farcau*, *Extraordinary optical transmission through titanium nitride-coated microsphere lattice*, Photonics and Nanostructures - Fundamentals and Applications 38, 100762 (2020), 1-6;
4. **A.M.M. Gherman**, V. Tosa , Local electric field enhancement in cuboid gold nanoparticle for SERS applications, AIP Conference Proceedings 2206(1) (2020), 050002;
5. **A.M.M. Gherman**, V. Tosa, A model for coherent beam combining of two ultrashort laser pulses, AIP Conference Proceedings 2206(1) (2020), 050003;
6. **A. M. M. Gherman**, K. Kovacs*, M.V. Cristea, V. Tosa, *Artificial Neural Network Trained to Predict High-Harmonic Flux*, Applied Sciences, 8 (2018), 2106, 1-15;
7. **A. M. M. Gherman**, N. Tosa*, M. V. Cristea, V. Tosa, S. Porav and P. S. Agachi, *Artificial neural networks modeling of the parameterized gold nanoparticles generation through photo-induced process*, Materials Research Express, 5 (2018), 085011, 1-13;
8. **A. M. M. Gherman**, N. Tosa*, D. N. Dadarlat, V. Tosa, M. V. Cristea, and P. S. Agachi, Temperature dynamics of laser irradiated gold nanoparticles embedded in a polymer matrix, Thermochimica Acta, 656 (2017), 25-31;

SUMMER SCHOOLS

Summer Schools

A.M.M. Gherman, C. Farcau, S. Boca, V. Tosa, *"Photothermal effects of laser irradiated colloidal gold nanostars"*, Photothermal Effects in Plasmonics, 24-29 Iunie 2018, Porquerolles, France - Poster

A.M.M. Gherman, H.T. Kim, V. Tosa, *"Modeling focusing and coherent superposition of PW beams"*, ELLIS Summer School, 27 August – 1 Septembrie 2017, Cheile Gradistei, Brasov, Romania - Poster

A.M.M.Gherman, N. Tosa, D. Dadarlat, V. Tosa, P.S. Agachi, *"Temperature Evolution in a Laser Irradiated System of one/a periodic array of Gold Nanoparticles Embedded in a Polymer Matrix"*, 5th International School Lasers in Materials Science, 10-17 Iulie 2016, Isola di San Servolo, Venice - Poster
