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Radu-Stefan Stirbu

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Gender: Male **Date of birth:** 05/08/1995 **Nationality:** Romanian

ABOUT ME

PhD student in the Faculty of Physics, field of Material Physics, at Alexandru Ioan Cuza University, Iasi, Romania

WORK EXPERIENCE

[15/02/2019 – 01/08/2020]

Software Engineer

ALTEN Delivery Center Iași, Romania

Main activities and responsibilities:
My very first job experience put me in a corporate environment, where I gained significant communication skills. As I my job was to project software that would be implemented on automobiles, I also developed some computational and system engineering knowledge.

[07/07/2021 – 01/10/2022]

Master's Student Researcher

Project HighKDevice, Alexandru Ioan CuzaUniversity, Iasi, Romania

Main activities and responsibilities:
My activity was aimed to develop computer-based models to describe mechanical stress-strain and piezoelectric responses of ferroelectric oxide – polymer composites.

[15/11/2021 – 01/10/2022]

Master's Student Researcher

Project ElectroChargEng, Alexandru Ioan CuzaUniversity, Iasi, Romania

Main activities and responsibilities:
My activities were related to the development of computer-based models, in order to emulate di erent kinds of phenomena (dielectric, piezoelectric, etc.) in combinations of dielectric/semiconductor - ferroelectric composite materials with different types of microstructures and phase connectivity.

[15/07/2022 – 01/01/2023]

PhD Student Researcher

Project EnginPOR, Alexandru Ioan CuzaUniversity, Iasi, Romania

Main activities and responsibilities:
The major activities are dedicated to developing computer-based models to describe mechanical properties, strain-stress fields and electric field distributions in porous ceramics or inhomogeneous structures and to derive the piezoelectric and pyroelectric responses; design of microstructures in porous ceramics to ensure enhanced piezoelectric and pyroelectric responses; design of composite materials for 3D printing.

[24/02/2024 – current]

Associated Assisting Professor

Faculty of Physics, Alexandru Ioan Cuza University, Iasi, Romania

EDUCATION AND TRAINING

[01/10/2021 – Current] **PhD in Physics**

Alexandru Ioan Cuza University https://www.uaic.ro/

Address: Blv. Carol I, No. 11, 700506, Iasi, Romania

Field(s) of study: Natural sciences, mathematics and statistics: *Physics*

Main subject / occupational skills covered:
My PhD is a continuation of my second Master's thesis. I am aiming at building models that can explain the relationships between the mechanical and electrical e□ects in piezoceramics.

[01/10/2022 – 15/07/2024] **Bachelor's Degree in physics**

Alexandru Ioan Cuza University https://www.uaic.ro/

Address: Blv. Carol I, No. 11, 700506, Iasi, Romania

Field(s) of study: Natural sciences, mathematics and statistics: *Physics*

Main subject / occupational skills covered:
Mainly general physics subjects are covered in this formation.

[01/09/2020 – 01/07/2022] **Master's Degree in Technological Physics**

Alexandru Ioan Cuza University https://www.uaic.ro/

Address: Blv. Carol I, No. 11, 700506, Iasi, Romania

Field(s) of study: Natural sciences, mathematics and statistics: *Physics*

Thesis: Mesoscale models of stress-strain fields in porous ceramics

Main subject / occupational skills covered:
A comparative study between two methods of investigating the way that pores in porous ceramic materials deform when the sample is subjected either to isostatic or uniaxial pressure was proposed. The first method is a modification of the theory that engineers use in order to design pressure vessels, adapted to be applied to one single pore in a continuous material. The second one is a finite element simulation of the behavior of much complex porous systems.

[01/10/2018 – 15/07/2020] **Master's Degree in Automobile Conception Management**

Gh. Asachi Technic University https://www.tuiasi.ro/

Address: Str. Prof. dr. docent Dimitrie Mangeron, nr. 67, 700050, Iasi, Romania

Field(s) of study: Engineering, manufacturing and construction: *Motor vehicles, ships and aircraft*

Final grade: 10/10

Main subject / occupational skills covered:
I ended up my first Master's Degree with a thesis where I proposed a simple way of calculating the size and currents needed for an Eddy current-based breaking system for automobiles.

[01/10/2014 – 15/07/2017] **Bachelor's Degree in Mechanical Engineering**

Gh. Asachi Technic University https://www.tuiasi.ro/

Address: Str. Prof. dr. docent Dimitrie Mangeron, nr. 67 , 700050, Iasi, Romania

Field(s) of study: Engineering, manufacturing and construction: *Motor vehicles, ships and aircraft*

Final grade: 9.91/10

Main subject / occupational skills covered:
During my undergraduate years I studied disciplines like mathematics, general physics, thermodynamics but also the basis of elasticity and finite element analysis.-I ended up this study program by proposing a method of correcting the polytropic indexes of the theoretical Stirling cycle, in order to better match the real efficiency of the engine.

LANGUAGE SKILLS

Mother tongue(s): Romanian

Other language(s):

French

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

English

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

German

LISTENING A1 **READING** A1 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

DIGITAL SKILLS

C programming language | FORTRAN Programming | Solidworks (CAD FEA) | COMSOL multiphysics

CONFERENCES AND SEMINARS

[20/10/2021 – 23/10/2021] **14th ECerS Conference for Young Scientists in Ceramics** Novi Sad, Serbia

I delivered a presentation strongly related to my Master's thesis, about models describing the strain-stress fields in porous ceramics.

http://cysc.mima.solutions/wp-content/uploads/2021/10/Program-CYSC-2021-Final.pdf

[14/05/2022] **60th FTEM National Conference** Iasi, Romania

I delivered a talk about the strain-stress field models, containing also a description of the piezoelectric effect.

http://ftem.faculty.ro/

[10/07/2022 – 14/10/2022] **Ceramics in Europe 2022** Cracow, Poland

I delivered two talks, the first one being dedicated to models for the mechanical and electromechanical properties of ferroelectric ceramics,, while the second has been related to the packing process of the ceramic powders, during the pressing step of the material preparation.

https://www.ceramicsineurope2022.org/conf-data/icc2022/files/program_LAST_06_072.pdf

[19/10/2022 – 22/10/2022] **7th International HYMA Conference** Genoa, Italy

I have presented a poster that showing results of simulations of electric and strain-stress field distributions in porous structures by considering new elements of ferroelectric properties (switching models) added to it.

https://www.elsevier.com/events/conferences/international-conference-on-multifunctional-hybrid-and-nanomaterials/programme

[02/07/2023 – 06/07/2023] **The XVIIIth Conference of the European Ceramic Society** Lyon, France

I have delivered a talk about various methods of converting imagery determined as a result of X-ray Tomography into valid geometric inputs for finite element calculations, dedicated to determining effective material properties.

https://www.ecers2023.org/en/program/full-conference-program/34?paramSearch34-0=stirbu

[11/10/2023 – 14/10/2023] **14th ECerS Conference for Young Scientists in Ceramics** Novi Sad, Serbia

I have delivered a talk about multiscale modelling as a method of studying various piezoelectric properties of ceramic materials, useful in further material and device designing.

[15/07/2024 – 18/07/2024] **10th International ROCAM Conference** Bucharest, Romania

Local vs. macroscopic properties of porous $BaTiO_3$ ceramics based on 3D reconstructedceramic microstructures
https://rocam.fizica.unibuc.ro/ROCAM/

[15/07/2024 – 18/07/2024] **Electroceramics XIX** Vilnius, Lithuania

Modeling of hysteretic response of porous piezo/ferroelectric ceramics
https://electroceramicsxix.exordo.com/programme/presentation/69

PUBLICATIONS

[2021]

Modifications of structural, dielectric and ferroelectric properties induced by porosity in $BaTiO_3$ ceramics with phase coexistence, by Padurariu, L. Curecheriu, LP.Ciomaga, CE. Airimioaei, M. Horchidan, Cioclea, C. Lukacs, VA., Stirbu, RS (Stirbu, Radu- Stefan), Mitoseriu, L., Journal of Alloys and Compounds, 889, 161699 (2021); 10.1016/j.jallcom.2021.161699

[2022]

$BaTiO_3$ nanocubes-Gelatin composites for piezoelectric harvesting: Modeling and experimental study, Ciomaga, CE; Horchidan, N; Padurariu, L; Stirbu, RS (Stirbu, Radu Stefan); Tiron, V ; Tufescu, FM; Topala, I; Condurache, O; Botea, M ; Pintilie, I ; Pintilie, L; Rotaru, A ; Caruntu, G; Mitoseriu, L., Ceramics International, 48 (18), 25880-25893 (2022); 10.1016/j.ceramint.2022.05.264

[2022]

Mesoscale Models for Describing the Formation of Anisotropic Porosity and Strain-Stress Distributions during the Pressing Step in Electroceramics, Stirbu, RS (Stirbu, Radu Stefan); Padurariu, L; Chamasemani, FF; Brunner, R; Mitoseriu, L, Materials, 15 (19), 6839 (2022); 10.3390/ma15196839

[2023]

Influence of Ferroelectric Filler Size and Clustering on the Electrical Properties of (Ag-BaTiO3)-PVDF Sub-Percolative Hybrid Composites, Padurariu, L (Padurariu, Leontin); Horchidan, N (Horchidan, Nadejda); Ciomaga, CE (Ciomaga, Cristina Elena) ; Curecheriu, LP (Curecheriu, Lavinia Petronela); Lukacs, VA (Lukacs, Vlad Alexandru); Stirbu, RS (Stirbu, Radu Stefan); Stoian, G (Stoian, George); Botea, M (Botea, Mihaela); Florea, M (Florea, Mihaela); Maraloiu, VA (Maraloiu, Valentin Adrian); Pintilie, L (Pintilie, Lucian); Rotaru, A (Rotaru, Aurelian); Mitoseriu, L (Mitoseriu, Liliana); 10.1021/acsami.2c15641

[2023]

Analysis of local vs. macroscopic properties of porous BaTiO3 ceramics based on 3D reconstructed ceramic microstructures, Padurariu, L (Padurariu, Leontin); Chamasemani, FF (Chamasemani, Fereshteh Falah); Brunner, R (Brunner, Roland); Curecheriu, LP (Curecheriu, Lavinia Petronela); Lukacs, VA (Lukacs, Vlad Alexandru); Stirbu, RS (Stirbu, Radu Stefan); Ciomaga, CE (Ciomaga, Cristina Elena) ; Mitoseriu, L (Mitoseriu, Liliana), 10.1016/j.actamat.2023.119084

[2024]

Modeling of hysteretic response of porous piezo/ferroelectric ceramics, Stirbu, RS (Stirbu, Radu Stefan); Mitoseriu, L, 10.1016/j.commatsci.2023.112633

[2024]

Porosity effect on the functional properties and energy harvesting performance of $Ba_{0.85}Ca_{0.15}Ti_{0.90}Zr_{0.10}O_3$ ceramics, Horchidan, N; Curecheriu, LP; Lukacs, VA; Stirbu, RS (Stirbu, Radu S.); Tufescu, FM; Dumitru, I; Stoian, G; Ciomaga, CE, 10.1111/jace.19622

[2024]

Cuboidal vs equiaxed: The role of nanopowder assembly during BaTiO3 ceramic pressing step, Lukacs, VA; Stirbu, R (Stirbu, Radu); Condurache, OA; Curecheriu, LP ; Airimioaei, M; Ciomaga, CE; Stoian, G; Caruntu, G; Mitoseriu, L; Buscaglia, MT 10.1016/j.jmst.2023.11.064