Curriculum Vitae

PERSONAL INFORMATION

George Alexandru Nemnes

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, No. 30, Reactorului Street, Magurele, Ilfov, ROMANIA (077125)

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Gender Male | Nationality Romanian

ORCID: 0000-0002-8500-4953

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WORK EXPERIENCE

2021 - present

Scientific Researcher I

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics, in particular materials and electronic devices, such as applications for quantum computing, biosensing devices for respiratory diseases; Machine learning techniques for the design of new materials and many-body quantum systems; Modeling perovskite solar cells; Density functional theory (DFT) for electronic structure calculations.

2023 - present

Professor

University of Bucharest, Faculty of Physics, “Materials and Devices for Electronics and Optoelectronics Research Center”, 077125 Magurele-Ilfov, Romania (until 2020) and The Research Institute of the University of Bucharest – I.C.U.B. (starting 2020)

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Computational methods for electronic structure, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations, many-body systems, machine learning techniques.

2017 - 2021

Scientific Researcher II

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics of nanodevices; Machine learning techniques for the design of new materials; Modeling perovskite solar cells; Density functional theory (DFT) for electronic structure calculations.

2016 - 2023

Assoc. Prof.

University of Bucharest, Faculty of Physics, “Materials and Devices for Electronics and Optoelectronics Research Center”, 077125 Magurele-Ilfov, Romania (until 2020) and The Research Institute of the University of Bucharest – I.C.U.B. (starting 2020)

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Parallel Computing Architectures, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations.

2016 - 2017

Scientific Researcher III

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics of nanodevices; molecular electronics and bio-applications; density functional theory (DFT) calculations.

2011 - 2015 **Research Assistant**

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Theoretical Physics, 077125 Magure-Ilfov, Romania

- Research activities: physics of nanodetectors; advanced statistical methods. Project: PN-II-ID-PCE-2011-3-0960

2009 - 2015 **Lecturer / Scientific Researcher III**

University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics Research Center", 077125 Magurele-Ilfov, Romania

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Parallel Computing Arhitectures, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations.

2004 - 2008 **PhD student, Researcher**

Technical University Chemnitz, D-09107 Chemnitz, Germany

- Research activities: PhD thesis "Sampling procedures for low temperature dynamics on complex energy landscapes".

Business or sector Research

EDUCATION AND TRAINING

2020 **Habilitation in Physics**
Affiilation to the Doctoral School of Physics, University of Bucharest

Defence Habilitation thesis in 2019: *"Computational studies on advanced materials with applications to nanoelectronic and optoelectronic devices"*

2004 - 2008 **PhD degree**

Technical University Chemnitz, D-09107 Chemnitz, Germany (*magna cum laude*)

- Dynamics of complex systems; spin glasses; parallel computing; computational physics.

1998 - 2003 **Diplomate Engineer**

University of Bucharest, Faculty of Physics, Romania (during 2001-2003 student at Brandenburg Technical University)

- Solid State Physics.

2001 - 2003 **Physicist**

Brandenburg Technical University, Germany

- Theoretical physics; semiconductor physics; semiconductor devices; transport properties of nanotransistors.

Awards

1997 -- First prize - National Physics Olympics

1998 -- First prize - National Physics Olympics

2017 -- Prize of University of Bucharest Senate - *Best research paper in Exact Sciences in 2017*

G. A. Nemnes, Cristina Besleaga, A. G. Tomulescu, Ioana Pintilie, L. Pintilie, K. Torfason, A. Manolescu, "Dynamic electrical behavior of halide perovskite based solar cells", Sol. Energy Mater. Sol. Cells 159, 197 (2017)

2023 -- Prize of University of Bucharest Senate - *Best MSc thesis in Exact Sciences in 2023*

MSc Student: Calin-Andrei Pantis-Simut

"Mapping confinement potentials and charge densities of many-body quantum systems using conditional generative adversarial networks", Mach. Learn.: Sci. Technol. 4 025023 (2023)

2023 -- Prize of University of Bucharest Senate - *Best research paper in Exact Sciences in 2023*

N. Filipoiu, A. T. Preda, D.-V. Anghel, R. Patru, R. E. Brophy, M. Kateb, C. Besleaga, A. G. Tomulescu, I. Pintilie, A. Manolescu, G.A. Nemnes, "Capacitive and Inductive Effects in Perovskite Solar Cells: The Different Roles of Ionic Current and Ionic Charge Accumulation", Phys. Rev. Applied 18, 064087 (2022)

PERSONAL SKILLS

Mother tongue(s) Romanian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
German	C1	C1	B1	B1	B1

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

Communication skills

- Interaction with BSc, MSc, PhD students: good communication skills gained through my experience as Professor at the Faculty of Physics, Bsc-, MSc- and PhD-coordinator.
- Collaborations with scientists in different institutions (National institute for materials physics – INCDFM, National institute for lasers, plasma and radiation physics – INFLPR, Reykjavik University, Brandenburg Technical University) .

Organisational / managerial skills

Project director of PN-II-RU-RP1/September2008, PN-II-RU-PD-2011-3-0044, PN-III-P2-2.1-PED-2019-1567 and PN-III-P4-ID-PCE-2020-1142. **Project responsible** of SEE 36/2021. Member in other national and international projects.

2023-2024 *„Design of novel nanomaterials for robust quantum transport (NanoMaQ)"* –
EEA mobility project 22-MOB-0048 –
Academic Project Coordinator – ANPCDEFP / EEA

2021-2023 *„Machine Learning Techniques for Solving Quantum Many-Body Problems (QuanticLearn)"*,
PN-III-P4-ID-PCE-2020-1142 –
Project Coordinator – Uefiscdi – Budget: 246047 EUR
http://solid.fizica.unibuc.ro/~nemnes/QuanticLearn/index.html

2021-2024 *„Towards perovskite large area photovoltaics (PERLA-PV)"*,
SEE 36/2021 – Project Responsible (IFIN-HH) – Uefiscdi / EEA –
Budget: 97000 EUR
http://perla-pv.ro/

2021-2023	*„Theoretical and experimental methods for perovskite photovoltaics (TEMPERO-PV)"* – EEA mobility project 21-MOB-0014 – Academic Project Coordinator – ANPCDEFP / EEA
2020-2022	*„Optimization of photoactive perovskite materials using machine learning techniques (OPTIM-PRV)"*, PN-III-P2-2.1-PED-2019-1567 – Project Coordinator (IFIN-HH) – Uefiscdi – Budget: 123107 EUR *https://optim-prv.nipne.ro/*
2011-2013	*"Advanced many-body spin transport and spin relaxation phenomena in nanowire systems",* PN-II-RU-PD-2011-3-0044 – Project Coordinator – CNCS –Budget: 69534 EUR *http://solid.fizica.unibuc.ro/~nemnes/PD/index.html*
2009-2011	*„Cylindrical Nanowire Transistor in the Landauer-Büttiker Formalism",* CNCSIS RP-1, Septembrie 2008 – Project Coordinator – CNCSIS – Budget: 107419 EUR *http://solid.fizica.unibuc.ro/~nemnes/RP-1/index.html*

Job-related skills

I am currently supervising 4 PhD students employed in IFIN-HH / DFCTI : (Nicolae Filipoiu, Amanda Teodora Preda, Alaa Allosh, Calin-Andrei Pantis Simut), 1 PhD student employed in INFLPR (Ioan Ghitiu) and I am collaborating with other PhD and MSc students (e.g. Iulia Zai at ELI-NP).

My research activity is focused on computational physics aspects in materials and electronic devices, such as electrical and thermal transport properties of nanodevices, biosensing elements, perovskite solar cells, applications of fractional exclusion statistics to interacting particle systems and DFT-based description of semiconductor and molecular systems. Many of the published papers concern computational studies in material science, defect/dopant engineering and modeling of electronic and optoelectronic devices. Recently, machine learning techniques were developed to predict electronic properties of materials and quantum many-body systems.

Computer skills

C/C++ programming (scientific applications); Tools for machine learning (TensorFlow, scikit-learn) Parallel programming (MPI); Computer cluster administration (FAI,SLURM); FPGA programming (using Verilog); Linux operating system.

Driving licence

Category B vehicles

ADDITIONAL INFORMATION

Publications
Projects
Conferences
Seminars
Honours and awards
Memberships
References

- 84 ISI papers, 71% as principal author (first or corresponding author)
- Projects won in competition (as principal investigator): PN-II-RU-RP1/September2008 > 100000 EUR; PN-II-RU-PD-2011-3-0044 > 60 000 EUR; PN-III-P2-2.1-PED-2019-1567 > 120 000 EUR; PN-III-P4-ID-PCE-2020-1142 > 240 000 EUR
- Invited talks at Reykjavik University, TIM18 Physics conference, 4th Edition of IWMP 2019, most recent -- Invited speaker at DEPERO 2023 conference: https://www.nanoge.org/DEPERO/general-information
- Prizes of the University of Bucharest Senate: *Best research paper in Exact Sciences in 2017 and 2023*; *Best MSc thesis in Exact Sciences in 2023.*
- Participation in COST action EuMINe, aiming at aims at promoting an international, interdisciplinary and intersectoral community focused on the application of materials informatics to the development and engineering of advanced materials, using machine leanring and materials modelling.
- Vice-president of the "Computational and Mathematical Physics" section of the Romanian Society of Physics (SRF); former president at the CMP section of SRF.
- Habilitation in Physics -- 2020;
- Citations in Nature Physics (IF>22), Nature Photonics (IF>38), Nature Communications (IF>13), Chemical Reviews (IF>54) etc.

ANNEXES

- List of publications.

List of publications

1. P.N. Racec*, E.R. Racec, **G.A. Nemnes** and U. Wulf, *"Coherent leakage current in mesoscopic MIS-type capacitors"*, Mater. Sci. Semicond. Process. 6, 129 (2003)

2. **G.A. Nemnes**, U. Wulf* and P.N. Racec, *"Nanoscale transistors in the Landauer-Büttiker formalism"*, J. Appl. Phys. 96, 596-604 (2004)

3. **G.A. Nemnes**, U. Wulf* and P.N. Racec, *"Nonlinear I-V characteristics of nanotransistors in the Landauer-Büttiker formalism"*, J. Appl. Phys. 98, 084308 (2005)

4. **G.A. Nemnes*** and K.H. Hoffmann, *"Dynamically relevant structural properties of short-range spin glasses and disordered ferromagnets"*, Phys. Rev. B 77, 172410 (2008)

5. **G.A. Nemnes*** and K.H. Hoffmann, *"Spin-box algorithm for low temperature dynamics of short range disordered Ising spin systems"*, Comp. Phys. Comm. 180, 1098 (2009)

6. **G.A. Nemnes***, L. Ion and S. Antohe, *"Self-consistent potentials and linear regime conductance of cylindrical nanowire transistors in the R-matrix formalism"*, J. Appl. Phys. 106, 113714 (2009)

7. **G.A. Nemnes***, U. Wulf, L. Ion and S. Antohe, "Ballistic transistors: From planar to cylindrical nanowire transistors", Trends in nanophysics, Springer (2010), book chapter, ISBN 978-3-642-12069-5 (2010)

8. **G.A. Nemnes***, L. Ion and S. Antohe, *"Thermo-electrical properties of nanostructured ballistic nanowires in the R-matrix formalism using the Implicitly Restarted Arnoldi Method"*, Physica E 42, 1613 (2010)

9. **G.A. Nemnes***, D. V. Anghel, *"Stochastic simulations for the time evolution of systems which obey generalized statistics: Fractional exclusion statistics and Gentile's statistics"*, J. Stat. Mech. P09011 (2010)

10. L. Ion*, **G.A. Nemnes**, C. Visan, D.E.N. Brancus, S. Antohe, *"Electron-optical phonon interaction in core-shell nanocolumn heterostructures made of wurtzite-type materials"*, Dig. J. Nanomater. Biostruct. 6, 331 (2011)

11. C. Visan, T.L. Mitran, Adela Nicolaev, **G.A. Nemnes**, L. Ion, S. Antohe*, *"Ab initio study of point-like defects influence on charge transport in AlN nanowires"*, Dig. J. Nanomater. Biostruct. 6, 1173 (2011)

12. T.L. Mitran, Adela Nicolaev, **G.A. Nemnes***, L. Ion, S. Antohe, *"Ab initio vibrational and thermal properties of AlN nanowires under axial stress"*, Comput. Mat. Sci. 50, 2955 (2011)

13. **G.A. Nemnes***, *"Spin current switching and spin-filtering effects in Mn-doped boron nitride nanoribbons"*, J. Nanomater. 748639 (2012)

14. **G.A. Nemnes***, A. Manolescu, V. Gudmundsson, *"Reduction of ballistic spin scattering in a spin-FET using stray electric fields"*, J. Phys.: Conf. Series 338, 012012 (2012)

15. Adela Nicolaev, T.L. Mitran, **G.A. Nemnes**, L. Ion*, S. Antohe, *"Ab-initio investigation of point-like defects in AlN nanowires"*, J. Phys.: Conf. Series 338, 012014 (2012)

16. **G.A. Nemnes***, C. Visan, S. Antohe, *"Thermopower of atomic-sized wurtzite AlN wires"*, Physica E 44, 1092 (2012)

17. T.L. Mitran, Adela Nicolaev, **G.A. Nemnes***, L. Ion, S. Antohe, *"Magnetic behavior and clustering effects in Mn-doped boron nitride sheets"*, J. Phys.: Condens. Matter 24, 326003 (2012)

18. **G.A. Nemnes*** and D.V. Anghel, *"Fractional exclusion statistics in systems with localized states"*, J. Phys.: Conf. Series 410, 012120 (2013)

19. **G.A. Nemnes***, *"Spin filtering effects in wurtzite and graphite-like AlN nanowires with Mn impurities"*, J. Nanomater. 408475 (2013)

20. D.V. Anghel*, **G.A. Nemnes** and F. Gulminelli, *"Equivalence between fractional exclusion statistics and self-consistent mean-field theory in interacting particle systems in any number of dimensions"*, Phys. Rev. E 88, 042150 (2013)

21. **G.A. Nemnes*** and C. Visan, *"Ab initio investigation of spin-filter effects in GaN nanowires with transitional metal impurities"*, Eur. Phys. J. Plus 128, 131 (2013)

22. **G.A. Nemnes*** and S. Antohe, *"Spin filtering in graphene nanoribbons with Mn-doped boron nitride inclusions"*, Mater. Sci. Eng. B 178, 1347 (2013)

23. **G.A. Nemnes*** and D.V. Anghel, *"Fractional exclusion statistics in non-homogeneous interacting particle systems"*, Rom. Rep. Phys. 66, 336 (2014)

24. **G.A. Nemnes*** and Adela Nicolaev, *"Transport in ferrocene single molecules for terahertz applications"*, Phys. Chem. Chem. Phys. 16, 18478 (2014)

25. T. L. Mitran, **G. A. Nemnes**, L. Ion and Daniela Dragoman*, "*Effects of graded distribution of scattering centers on ballistic transport"*, J. Appl. Phys. 116, 124316 (2014)

26. **G. A. Nemnes*** and Camelia Visan, "*Electron transport properties of fulgide-based photochromic switches*", RSC Advances 5, 26438 (2015)

27. **G. A. Nemnes***, D.V. Anghel, "Glassy behavior of disordered fractional exclusion statistics systems*"*, Rom. J. Phys. 60, 691 (2015)

28. A. A. Nila, **G. A. Nemnes***, A. Manolescu, "*Ab initio investigation of optical properties in triangular graphene - boron nitride core-shell nanostructures"*, Rom. J. Phys. 60, 696 (2015)

29. A. E. Stanciu, **G. A. Nemnes*** and A. Manolescu, "*Thermoelectric effects in nanostructured quantum wires in the non-linear temperature regime*", Rom. J. Phys. 60, 716 (2015)

30. **G. A. Nemnes***, C. Goehry, T. L. Mitran, Adela Nicolaev, L. Ion, S. Antohe, N. Plugaru, A. Manolescu, "*Band alignment and charge transfer in rutile-TiO2/CH3NH3PbI3-xClx interfaces*", Phys. Chem. Chem. Phys. 17, 30417 (2015)

31. C. Goehry, **G. A. Nemnes** and Andrei Manolescu*, "*Collective Behavior of Molecular Dipoles in CH3NH3PbI3*", J. Phys. Chem. C 119, 19674 (2015)

32. **G. A. Nemnes*** and Sorina Iftimie, "*Charge localization effects and transport in dendritic nanostructures for photovoltaic applications*", Appl. Surf. Sci. 352, 158 (2015)

33. **G. A. Nemnes*** and Camelia Visan, "*Ab initio vibrational and thermal properties of carbon allotropes: polycyclic and rectangular networks*", Comput. Mat. Sci. 109, 14 (2015)

34. Visan Camelia and **G. A. Nemnes***, *"Ab Initio Investigations of Thermoelectric Effects in Graphene - Boron Nitride Nanoribbons"*, EPJ Web of Conferences 108, 02045 (2016)

35. **G. A. Nemnes***, Camelia Visan, D. V. Anghel and A. Manolescu, "Molecular dynamics of halogenated graphene - hexagonal boron nitride nanoribbons", J. Phys.: Conf. Series 738, 012027 (2016)

36. **G. A. Nemnes*** and D. V. Anghel, *"A drift-diffusion model based on the fractional exclusion statistics"*, J. Phys.: Conf. Series 738, 012006 (2016)

37. A. Manolescu*, **G. A. Nemnes**, A. Sitek, T. O. Rosdahl, S. I. Erlingsson, and V. Gudmundsson, *"Conductance oscillations of core-shell nanowires in transversal magnetic fields",* Phys. Rev. B 93, 205445 (2016)

38. T.L. Mitran, **G. A. Nemnes***, L. Ion, Daniela Dragoman, "*Ballistic electron transport in wrinkled superlattices",* Physica E 81, 131 (2016)

39. S. Heedt*, A. Manolescu, **G. A. Nemnes**, W. Prost, J. Schubert, D. Grutzmacher and T. Schaepers, *"Adiabatic Edge Channel Transport in a Nanowire Quantum Point Contact Register"*, Nano Lett. 16, 4569 (2016)

40. D.V. Anghel* and **G. A. Nemnes**, "*The application of the fractional exclusion statistics to the BCS theory--a redefinition of the quasiparticle energies"*, Physica A 458, 276 (2016)

41. **G. A. Nemnes***, Alexandra Palici and A. Manolescu, *"Transparent boundary conditions for time-dependent electron transport in the R-matrix method with applications to nanostructured interfaces"*, Comput. Phys. Commun. 208, 109 (2016)

42. Adela Nicolaev, T. L. Mitran, Sorina Iftimie, **G. A. Nemnes***, "*Optimization of halide perovskite solar cells based on nanocolumnar ZnO*", Sol. Energ. Mater. Sol. Cells 158, 202 (2016)

43. D.V. Anghel* and **G. A. Nemnes**, "The role of the chemical potential in the BCS theory",

Physica A 464, 74 (2016)

44. Cristina Besleaga, Laura Elena Abramiuc, Viorica Stancu, A. G. Tomulescu, M. Sima, Liliana Trinca, N. Plugaru, L. Pintilie, **G. A. Nemnes**, Mihaiela Iliescu, H. G. Svavarsson, A. Manolescu and Ioana Pintilie, *"Iodine Migration and Degradation of Perovskite Solar Cells Enhanced by Metallic Electrodes"*, J. Phys. Chem. Lett. 7, 5168 (2016)

45. **G. A. Nemnes***, Cristina Besleaga, A. G. Tomulescu, Ioana Pintilie, L. Pintilie, K. Torfason, A. Manolescu, “Dynamic electrical behavior of halide perovskite based solar cells”, Sol. Energ. Mater. Sol. Cells 159, 197 (2017)

46. T. L. Mitran and **G. A. Nemnes***, *"Helical graphite metamaterials for intense and locally controllable magnetic fields"*, RSC Adv. 7, 49041 (2017)

47. N. Plugaru*, **G. A. Nemnes**, L. Filip, Ioana Pintilie, L. Pintilie, K. T. Butler and Andrei Manolescu, *"Atomistic Simulations of Methylammonium Lead Halide Layers on PbTiO3 (001) Surfaces"*, J. Phys. Chem. C 121, 9096 (2017)

48. **G. A. Nemnes***, Camelia Visan, A. Manolescu, *"Electronic and thermal conduction properties of halogenated porous graphene nanoribbons"*, J. Mater. Chem. C 5, 4435 (2017)

49. **G. A. Nemnes***, Cristina Besleaga, Viorica Stancu, Daniela Emilia Dogaru, Lucia Nicoleta Leonat, L. Pintilie, K. Torfason, M. Ilkov, A. Manolescu, Ioana Pintilie, *"Normal and inverted hysteresis in perovskite solar cells"*, J. Phys. Chem. C 121, 11207 (2017)

50. S. I. Erlingsson*, A. Manolescu, **G. A. Nemnes**, J. H. Bardarson and D. Sanchez, *"Reversal of thermoelectric current in tubular nanowires"*, Phys. Rev. Lett. 119, 036804 (2017)

51. **G. A. Nemnes***, Sorina Iftimie, Alexandra Palici, Adela Nicolaev, T.L. Mitran, A. Radu, S. Antohe, *"Optimization of the structural configuration of ICBA/P3HT photovoltaic cells"*, Appl. Surf. Sci. 424, 264 (2017)

52. Alexandra Palici, **G. A. Nemnes***, Cristina Besleaga, L. Pintilie, D. V. Anghel, Ioana Pintilie, and A. Manolescu, *"The Influence of the Relaxation Time on the Dynamic Hysteresis in Perovskite Solar Cells"*, EPJ Web of Conferences 173, 03017 (2018)

53. **G. A. Nemnes***, T. L. Mitran and Daniela Dragoman, *"Ballistic transport in graphene Y-junctions in transverse electric field"*, Nanotechnology 29, 355202 (2018)

54. **G. A. Nemnes***, Cristina Besleaga, A. G. Tomulescu, Alexandra Palici, L. Pintilie, A. Manolescu and Ioana Pintilie, *"How measurement protocols influence the dynamic J-V characteristics of perovskite solar cells: theory and experiment"*, Solar Energy 173, 976 (2018)

55. **G. A. Nemnes***, T. L. Mitran, A. Manolescu and Daniela Dragoman, *"Electric field effect in boron and nitrogen doped graphene bilayers"*, Comput. Mater. Sci. 155, 175 (2018)

56. **G. A. Nemnes***, T.L. Mitran, A. Manolescu, *"Gap prediction in hybrid graphene - hexagonal boron nitride nanoflakes using artificial neural networks"*, Journal of Nanomaterials 6960787 (2019)

57. M. T. Sultan, A. Manolescu, J. T. Gudmundsson, K. Torfason, **G. A. Nemnes**, I. Stavarache, C. Logofatu, V. S. Teodorescu, M. L. Ciurea, H. G. Svavarsson, *"Enhanced photoconductivity of SiGe nanocrystals in SiO2 driven by mild annealing"*, Appl. Surf. Sci. 469, 870 (2019)

58. **G. A. Nemnes***, T. L. Mitran, A. Manolescu and Daniela Dragoman, *"Electric and thermoelectric properties of graphene bilayers with extrinsic impurities under applied electric field"*, Physica B 561, 9 (2019)

59. **G. A. Nemnes*** and Daniela Dragoman, *"Reconfigurable quantum logic gates using Rashba controlled spin polarized currents"*, Physica E 111, 13 (2019)

60. **G. A. Nemnes***, Cristina Besleaga, A. G. Tomulescu, Lucia Nicoleta Leonat, Viorica Stancu, Mihaela Florea, A. Manolescu and Ioana Pintilie, *"The hysteresis-free behavior of perovskite solar cells from the perspective of the measurement conditions "*, J. Mater. Chem. C 7, 5267 (2019)

61. **G. A. Nemnes***, D. Dragoman, M. Dragoman, *"Graphene bandgap induced by ferroelectric $Pca2_1$ HfO_2 substrate: a first-principles study"*, Phys. Chem. Chem. Phys. 21, 15001 (2019)

62. D. V. Anghel, **G. A. Nemnes***, A. Manolescu and Ioana Pintilie, *"Modelling J-V hysteresis in perovskite solar cells induced by voltage poling"*, Physica Scripta 94, 125809 (2019)

63. A. G. Tomulescu, Viorica Stancu, Cristina Besleaga, Monica Enculescu, **G. A. Nemnes**, Mihaela Florea, V. Dumitru, L. Pintilie, Ioana Pintilie, Lucia Leonat, *"Reticulated mesoporous TiO2 scaffold, fabricated by spraycoating, for large area perovskite solar cells"*, Energy Technol. 8, 1900922 (2019)

64. **G. A. Nemnes***, D. Dragoman, *"A ballistic transport model for an artificial neuron"*, Physica Stat. Sol. A 217, 1900936 (2020)

65. T.L. Mitran and **G.A. Nemnes*,** "Prediction of energy gaps in graphene - hexagonal boron nitride nanoflakes using artificial neural networks", Theory and Simulation in Physics for Materials Applications -- Cutting-Edge Techniques in Theoretical and Computational Materials Science, Springer (2020), book chapter, ISBN 978-3-030-37789-2 (2020)

66. N. Filipoiu and **G.A. Nemnes***, *"Prediction of Equilibrium Phase, Stability and Stress-Strain Properties in Co-Cr-Fe-Ni-Al High Entropy Alloys Using Artificial Neural Networks"*, Metals 10, 1569 (2020)

67. T.L. Mitran and **G.A. Nemnes**, *"Ground state charge density prediction in C-BN nanoflakes using rotation equivariant feature-free artificial neural networks"*, Carbon 174, 276 (2021)

68. **G. A. Nemnes***, Nicolae Filipoiu and Valentin Sipica, *"Feature selection procedures for combined density functional theory - artificial neural network schemes"*, Physica Scripta 96, 065807 (2021)

69. O. Cojocaru, A.-M. Lepadatu, **G.A. Nemnes**, T. Stoica, M.L. Ciurea, *"Bandgap atomistic calculations on hydrogen-passivated GeSi nanocrystals"*, Sci. Rep. 11, 13582 (2021)

70. N. Filipoiu, T. L. Mitran, D. V. Anghel, M. Florea, I. Pintilie, A. Manolescu and **G. A. Nemnes***, *"Investigation of Opto-Electronic Properties and Stability of Mixed-Cation Mixed-Halide Perovskite Materials with Machine-Learning Implementation"*, Energies 14, 5431 (2021)

71. D.V. Anghel, A.T. Preda, **G.A. Nemnes***, *"The R-matrix formalism for two-particle scattering problems"*, Phys. Lett. A 425, 127865 (2022)

72. C.A. Pantis-Simut, A.T. Preda, N. Filipoiu, A. Allosh, **G.A. Nemnes***, *"Electric-Field Control in Phosphorene-Based Heterostructures"*, Nanomaterials 12, 3650 (2022)

73. **G. A. Nemnes***, T. L. Mitran, A. T. Preda, I. Ghiu, M. Marciu and A. Manolescu, *"Investigation of bi-particle states in gate-array-controlled quantum-dot systems aided by machine learning techniques"*, Physica Scripta 97, 055813 (2022)

74. R. Plugaru, E. Fakhri, C. Romanitan, I. Mihalache, G. Craciun, N. Plugaru, H.O. Arnason, M.T. Sultan, **G.A. Nemnes**, S. Ingvarsson, H. Svavarsson, A. Manolescu, *"Structure and electrical behavior of silicon nanowires prepared by MACE process"*, Surfaces and Interfaces 33, 102167 (2022)

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