CURRICULUM VITAE

Personal information

Name, Surname:	Niculescu Alina Elena
Date of birth:	[redacted]
Nationality:	Romanian
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Education

Year	Faculty/department - University/institution - Country
2007-2009 (dissertation defended)	MSc. Student – Material Science, diploma Series H Nr. 0064891, West University of Timisoara, Faculty of Physics, Material Science, Romania, with nr. 1516/13.09.2011, http://portideschise.physics.uvt.ro
2002-2007	Student diploma Series G Nr. 0024435, West University of Timisoara, Faculty of Physics, Technological Physics Department, Romania http://portideschise.physics.uvt.ro
2021 - present	PhD. Student, Polytechnic University of Bucharest, Energy Departement

Positions - current and previous

(*Academic sector/research institutes/industrial sector/public sector/other)*

Year	Job title – Employer - Country
2007-2009	Research assistant in Ultrasonic welding Department in the frame of National Research and Development Institute for Welding and Material Testing – Timisoara, Romania www.isim.ro
2009-present	Researcher in Low Temperature Laboratory in the frame of National Research and Development Institute for Cryogenic and Isotopic Technologies – Ramnicu Valcea www.icsi.ro
2024 - prezent	PhD student researcher Constanta Maritime University, https://cmu-edu.eu/en/

Project management experience

Year	Project title - Role - Funder - Budget - link to project webpage
2012-2019	**Participation in F4E projects** 1. FP9 – EUROfusion – DEMO Breeding Blanket – Tritium Extraction and Removal for Helium Cooled Pebble Bed type breeding blanket; 2. R&D in Support of Conceptual Design of ITER Hydrogen Isotope Separation System. 3. F4E-2010-045(PNS-VTP) – „Finalization of the system capacity, enhancements studies and detailed design of WDS components including HAZOP studies" 4. IO/CFN/11/5660 - „R&D on Capture and Exchange Method for Processing Highly Tritiated Water" **Participation in the National Core Projects** 1. Explora PN18 12 02 02 - "Theoretical and experimental research for the design of a multifunctional technological facility for deuterium and tritium separation aiming the enhancement of these isotopes management" 2. PN 19 11 01 03 – "Intelligent catalysts for enhancing the efficiency of the chemical processes that take place in the presence of water and humitidy aplicable in the nuclear and environmental fields" 3. PN 19 11 01 04 – "Inovative soltion for CECE process in order to promote a new decontamination technology of the liquid waste with low tritium concentration and deuterium recovery
2020-prezent	1. Agreement On Academic, Scientific and Technical Cooperation between the National Research and Development Institute for Cryogenic and Isotopic Technologies and the ITER International Fusion Energy Organization Academic, Scientific and Technical Cooperation ITER Organization CTR LGA-2024-A-149 - **2025** 2. Maximizing the Renewable Energy Hosting Capacity of Distribution networks – **2025** 3. Collaboration Framework agreement between CAEP – China and ICSI Romania - **2025** 4. Participarea Romaniei la EUROfusion WPBB1 si cercetari complementare / WPBB1-RO 2022 – 2024 contract nr. EU-02_03.01.**2022** 5. Participarea Romaniei la EUROfusion WPBB1 si cercetari complementare / WPBB1-RO 2024 – 2026 contract nr. EURATOM-RO/CDI/2024_001/**2024** 6. *Program Nucleu "Lab-2-Field" - Generarea de tehnologii inovative prin cercetare-dezvoltare, de la nivel de laborator la aplicație, pentru România de mâine,* Contract nr. 20N / 05.01.2023 ✓ proiectul: PN23150105 "Tehnologii complexe de producere si stocare a hidrogenului lichid pentru aplicatii mobile" an 2023, an **2024** ✓ proiectul: PN23150106 „Nanostructuri 2D în fabricarea aditivă pentru energia și stocarea hidrogenului" an **2024** ✓ proiectul: PN 23 15 03 02 "Dezvoltarea tehnologiei inovative de separare a

	izotopilor Litiului prin electromobilitate şi algoritmi de inteligenţă artificială" an **2024** ✓ proiectul: PN 23 15 03 03 "Către un management modern al tritiului şi al materialelor asociate - Sistem modular avansat bazat pe dezvoltarea tehnologiei de separare a tritiului prin procesul CECE" an 2023, an **2024** ✓ proiectul: PN 23 15 03 04 "Dezvoltarea unei tehnologii de distilare criogenică pentru separarea speciilor izotopice ale hidrogenului și heliului" an 2023, an **2024** ✓ proiectul: PN 23 15 03 05 ''Tehnologie inovativă pentru recombinarea/arderea catalitică cu oxigenul, la temperatură joasă a izotopilor hidrogenului'' an 2023, an **2024** 7. *Program Nucleu Dezvoltare de tehnologii pentru tranziţia energetică şi impact asupra mediului – Aducând ştiinţa în scop societal – „ICSI-4EE",* Contract nr. 9N / 07.02.2019 ✓ proiectul: PN 19 11 01 01 "Cercetări teoretice şi experimentale privind permeația simultană a izotopilor hidrogenului prin metale şi barierele antipermeație" an **2022** ✓ proiectul: PN 19 11 01 02 "Dezvoltarea metodelor de testare a materialelor utilizate în domeniul criogeniei și a sistemelor tehnologice criogenice de purificare și separare izotopică" an 2021, an **2022** ✓ proiectul: PN 19 11 01 04 "Soluție inovatoare de proces CECE în scopul promovării unei noi tehnologii de decontaminare a deşeurilor lichide, slab concentrate în tritiu şi de recuperare a deuteriului" an 2021, an **2022** ✓ proiectul: PN 19 11 01 03 "Catalizatori inteligenți pentru creşterea eficienței proceselor chimice desfăşurate în prezența apei şi a umidității cu aplicații în domeniul nuclear şi al protecției mediului" an **2021** ✓ proiectul: PN 19 11 02 04 "Dezvoltarea de electroliți solizi cu conductivitate ultra-ridicată și electrozi cu stabilitate ciclică îmbunătățită pentru baterii solid-state" an **2021** ✓ proiectul: PN 19 11 02 05 "Nanostructuri de carbon obținute prin metoda creşterii prin depunere chimică din faza de vapori (CVD) pentru dispozitive electrochimice de producere a energiei electrice" an **2021** ✓ proiectul: PN 19 11 03 03 "Tehnici avansate pentru identificarea surselor de contaminare şi a reacțiilor biochimice în ecosistemele acvatice" an **2021**

Other relevant professional experiences

Year	Description - Role
2009-present	Experience related to the mathematical modelling of a multicomponent cryogenic distillation process; Extensive experience in the analysis, measurement and characterisation of various tritiated/isotopic fluids; Deep knowledge in the measurement of molecular species concentration profile

	along the CD, LPCE and VPCE column used for isotopic separation processes; Multiannual experience working with quadrupole mass spectrometry (QMS), IR spectroscopy, Liquid scintillation counting (LSC) and Raman spectroscopy.

Track record of the last 10 years

1. George Ana, George Bulubasa, Alina Niculescu, Maria Craciun, Ciprian Bucur, Iuliana Stefan, Characterization of water adsorption capacity at high pressure of the molecular sieve proposed to be used in TER RMSB, Fusion Engineering and Design, Volume 215, 115039, **2025**, https://doi.org/10.1016/j.fusengdes.2025.115039
2. Niculescu Alina, Bulubasa Gheorghe, Ana George, Bornea Anisia - Helium-3 Applications and Recovery Techniques, Journal of Fusion Energy, vol. 44, issue 1, article number 20, **2025**, https://doi.org/10.1007/s10894-025-00491-6
3. Ana, George; Niculescu, Alina; Cristescu, Ion; Bulubasa, Gheorghe - Preliminary evaluation of NEG materials in view of CMSB replacement in HCPB TER architecture, Fusion Engineering and Design, Vol.199, February **2024**, Article number 114135, 10.1016/j.fusengdes.2023.114135
4. Niculescu Alina, Gheorghe Lazaroiu - Studies regarding the energetic properties of hydrogen and methane mixtures for domestic and industrial applications, UPB Scientific Bulletin, Series C: Electrical Engineering and Computer ScienceVolume 86, Issue 2, Pages 383 – 397, **2024**
5. Bulubasa Gheorghe; Niculescu Alina; Ana George; Bucur Ciprian; Crăciun Maria; Bornea Anisia - Investigations on Hydrogen Isotope Separation Factor Employing Palladium-Based Solid Metallic Membranes, Fusion Science and Technology, **2024**, 10.1080/15361055.2024.2353967
6. Bulubasa Gheorghe; Niculescu Alina; Ana George; Bucur Ciprian; Ștefan Iuliana; Crăciun Maria; Bornea Anisia - Investigations on 3He: Hydrogen Isotope Separation Employing Palladium/Silver Membranes, Fusion Science and TechnologyVolume 80, Issue 3-4, Pages 411 – 415, **2024**, 10.1080/15361055.2023.2271242
7. Niculescu A., Bulubașa G., Ana G., Bucur C., Crăciun M., Bornea A. - Integration of a Microchannel Reactor in a CECE Process for H2 Removal from the O2 Stream Produced by the H2 Generator, (2024) Fusion Science and Technology, 80 (3-4), pp. 416 – 421 DOI: 10.1080/15361055.2023.2273043, **2023**
8. Bulubasa Gheorghe, Niculescu Alina, Vasut Felicia, Ana Radu – "New method for calibration of a quadrupole mass spectrometer for hydrogen isotopes measurements" - Fusion Engineering and Design, Volume: 166, DOI: 10.1016/j.fusengdes.2021.112274, May 2021
9. Eusebiu Ilarian Ionete, Alina Elena Niculescu, Stefan Ionut Spiridon, Bogdan Florian Monea, „Magnetoresistance behavior of cryogenic temperature sensors based on single-walled carbon nanotubes", IEEE Sensors Journal, ISSN: 1558-1748, DOI: 10.1109/JSEN.2020.3027038, Set 2020, FI: 3,073
10. Popescu Gh., Ana George, Niculescu Alina et al – "Commissioning of the LPCE and purification systems as front -end of the experimental pilot plant for D-T separation", Fusion Engineering and Design, Volume: 161, DOI: 10.1016/j.fusengdes.2020.112044, Dec 2020
11. Niculescu Alina, Bornea Anisia, Ana George, Zamfirache Marius - "Development of specific software for hydrogen isotopes separation by cryogenic distillation of ICSI Pilot Plant", Fusion Engineering and Design, Volume: 158, DOI:10.1016/j.fusengdes.2020.111642, Sept 2020. FI:

1,692

12. Bornea Anisia, Ana George, Niculescu Alina et al - "New catalytic packing performance: Theoretical and experimental characterization for LPCE process", Fusion Engineering and Design Volume 146, Pages 2384-2388, 2019, DOI: 10.1016/ j.fusengdes.2019.03.196, FI: 1,457
13. Alina Niculescu, Anisia Bornea, George Ana, Toma Constantin - "Provisions for a cryogenic distillation process linked to a CECE process at ICSI Rm. Valcea", Fusion Engineering and Design Volume 146, Part B, September 2019, Pages 1834-1837, FI: 1.457
14. George Ana, Gheorghe Pasca, Mirela Draghia, Alina Niculescu, Anisia Bornea, Marius Zamfirache - "Multi-criteria analysis of suitable technologies for the Tritium Removal System in Valcea D-T Pilot Plant", Fusion Engineering and Design Volume 146, Part A, September 2019, Pages 1381-1384, FI: 1,457
15. George Ana, Alina Niculescu, Florian Vladulescu, Radu Ana, Gheorghe Pasca - "Thermal analysis of a cryogenic distillation column for hydrogen isotopes separation", Fusion Engineering and Design Volume 146, Part B, September 2019, Pages 1868-1871, FI: 1,457
16. Alina Niculescu, George Ana, Toma Constantin, Mirela Draghia, "Dynamic simulation of a multicomponent distillation column for D-T separation", Fusion Engineering and Design 124 (2017) 752-756
17. George Ana, Nicolae Sofilca, Alina Niculescu, Mirela Draghia - "Investigation of some critical scenarios due to various failures of ICSI Cryogenic Distillation System", Fusion Engineering and Design 124 (2017) 861–864
18. I. Cristescu, G. Ana, D. Demange, R. Michling, A. Niculescu, C. Petrutiu, T. Pinna, S. Welte - "Design and R&D activities of TriPla-CA Consortium in support of ITER Tritium Plant development", Fusion Engineering and Design 89 , 1524–1528, 2014

Narrative CV

The most significant contributions of my work lie in two interconnected research directions: isotopic separations and the combustion of hydrogen–methane mixtures. I have participated in several research projects describes above. Within the CTRF project, ICSI Râmnicu Vâlcea played a central role as the developer of the innovative Romanian tritium removal technology. The institute contributed with research and development in hydrogen isotope separation, design and validation of detritiation processes, and technology transfer towards industrial implementation. My work was directly connected to these efforts, focusing on modeling, experimental validation, and the optimization of isotopic exchange systems. Complementary to this, my research on the combustion of hydrogen–methane mixtures generated both experimental and numerical data on flame stability, pollutant emissions, and the design of a diffusion burner. These results have advanced the understanding of sustainable fuel applications and contributed to strategies for reducing greenhouse gas emissions. Taken together, these works have had the greatest impact by bridging fundamental isotope science with applied energy research, providing solutions for both clean energy production and advanced nuclear systems.