CURRICULUM VITAE

Personal information

Name, Surname:	Traian, ROTARIU		
Date of birth:		Gender:	Male
Nationality:	Romanian		
Researcher unique identifier(s) (ORCID, Researcher ID etc.):	https://orcid.org/0000-0003-4294-2728 https://scholar.google.com/citations?user=CmBSROIAAAAJ&hl=en&oi=ao https://www.scopus.com/authid/detail.uri?authorId=23478170000		
Personal link from the platform at https://www.brainmap.ro/	https://www.brainmap.ro/traian-rotariu		

Education

Year	Faculty/department - University/institution - Country
2005 (dissertation defended)	**PhD in Chemical Engineering** from University Politehnica of Bucharest. PhD thesis supervisor: Prof. dr. eng. Ghorghe HUBCA. Title: *Energetic compounds obtained by chemical modification of polymers*
1991-1997	**Chemical Engineer Diploma (long duration studies)**, Faculty of Armament, Ammunitions, and Missiles, Military Technical Academy - Bucharest, Specialization "Military

Positions - current and previous

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

Year	Job title – Employer – Country
10.2017-present	**Full professor,** Military Technical Academy, Department of Armament Systems, Engineering and Mechatronics. Courses/Laboratories: Chemistry of explosives, Technology of explosives, Energetic materials, Analysis and identification of explosives and CBRN agents, Methodology of scientific research
2005 – 2017	**Associate professor**, Military Technical Academy, Department of Armament Systems, Engineering and Mechatronics. Courses/Laboratories: Chemistry of explosives, Technology of explosives, Energetic materials, Analysis and identification of explosives and CBRN agents, Testing of energetic materials
1998-2005	**Assistant professor**, Military Technical Academy, Department of Armament Systems, Engineering and Mechatronics. Courses/Laboratories: Chemistry of explosives, Fuels and lubricants, Analysis and identification of explosives and CBRN agents
1997-1998	**Head of Explosives and Military Chemistry Laboratory**, Military Technical Academy, Department of Armament Systems, Engineering and Mechatronics. Management of the laboratory activities for the support of educational and research activity.

Project management experience

(*Academic sector/research institutes/industrial sector/public sector/other. Please list the most relevant.)*

Year	Project title - Role – Funder – Budget – link to project webpage
2022-2026	EMPOF - Energetic Materials – Production, Obsolescence, and Formulation – Project Arrangement No B.PRT.RT.957/2022, European Defense Agency project, budget €9.48 milion**,** 15 partners from 8 countries, N**ational coordinator**
2018-2023	EXERTER - 786805-EXERTER-H2020-SEC-2016-2017-2, SECURITY OF EXPLOSIVES PAN-EUROPEAN SPECIALISTS NETWORK, ***H2020 funding***, **Project Responsible -** BUGET € 3 498 868,75 https://exerter-h2020.eu/

2009-2012	ENVIRONMENTALLY RESPONSIBLE MUNITIONS, *EUROPEAN DEFENSE AGENCY*, CONTRACT B0423-GEM2-ERG, 5 countries, 6 partners, **Project responsible and National coordinator,** Budget: €2,21 million
2014-2016	ERASMUS+ KA2 PROJECT – GREENER AND SAFER ENERGETIC AND BALLISTIC SYSTEMS, ROMANIA, FRANCE, GREAT BRITAIN, PORTUGAL, ***EU Union***, **Project manager,** 92,400 EURO, https://www.erasmusly.com/greener-and-safer-energetic-and-ballistic-systems-erasmus-project.html
2018-2020	"Contingenta Hazardurilor CBRN si Imbunatatirea Mijloacelor de Securitate NationalaSECURE-NET", UEFISCDI, Contract 70PCCDI/2018, ***UEFISCDI National funding***, **MTA Project responsible, MTA budget 628,800 lei,** https://www.icechim-rezultate.ro/proiect.php?id=40
2025-2026	*250 kg low drag type explosive bomb for F-16/IAR 99 Falcon/Standard SkyWard aircraft - PN-IV-P7-7.1-PTE-2024-0517-* no. Contract 15PTE/2025, ***UEFISCDI National funding*** **MTA project responsible, MTA budget 125.000 lei,**

Other relevant professional experiences

(e.g. institutional responsibilities, organisation of scientific meetings, membership in academic societies, review boards, advisory boards, committees and major research or innovation collaborations, other commissions of trust in public or private sector)

Year	Description - Role
Since 2008	Head of the didactical committee *Energetic Materials and CBRN* defense, MTA
2009-2012	ERASMUS Institutional Coordinator of the Military Technical Academy;
2012	Vice-Dean of the Faculty of Integrated Armament Systems and Mechatronics, MTA;
2012-2015	Vice-Rector for International Relations in the Military Technical Academy;
2015-2018	Head of the Department – Armament Systems Engineering and Mechatronics;
2018-present	President of the University Senate of the Military Technical Academy "Ferdinand I".
Commisions of trust	
2005-present	RO Governmental Expert for the CapTech Ammunition Technology in the European Defense Agency (EDA);
2015 – present	Pannel member (national expert for energetics) for the Applied Vehicle Technology panel in NATO Science and Technology Organization;
2015 - present	Member of the Scientific Committee and Chairman of the organizing committee for the *Greener and Safer Energetic and Ballistic Systems* International Conference;
2015 – present	Member of the Scientific Committee for the *New Trends in Research of Energetic Materials* International annual Conference – Pardubice-Czech Republic;
2022	Member of the Steering Committee of ROMAT International Conference;

Track record of the last 10 years

The selection emphasizes multifunctional polymeric materials, energetic and protection-related composites, sustainability-oriented binders, nanocomposite coatings, and advanced protective/decontamination systems.

1. Rotariu, T.; Moldovan, A.E.; Toader, G.; Diacon, A.; Rusen, E.; Ginghina, R.E.; Iorga, O.; Botiș, H.R.; Klapötke, T. "Green" PBX Formulations Based on High Explosives (RDX and HMX) and Water-Soluble pH-Sensitive Polymeric Binders. *Polymers* **2023**, *15*, 1790, doi.org/10.3390/polym15071790. Relevance: *direct evidence of expertise in polymer-bonded energetic composites, environmentally friendlier binder design, and selective recovery/reuse concepts aligned with circular materials development.*

2. Rotariu, T.; Pulpea, B.-G.; Dîrloman, F.-M.; Diacon, A.; Rusen, E.; Toader, G.; Zvîncu, N.-D.; Iordache, T.-V.; Botiș, R.H. The Influence of Potassium Salts Phase Stabilizers and Binder Matrix on the Properties of Novel Composite Rocket Propellants Based on Ammonium Nitrate. *Materials* **2022**, *15*, 8960,

doi.org/10.3390/ma15248960. Relevance: *demonstrates control of composite formulation, matrix effects, and performance tuning in energetically loaded multifunctional materials.*
3. Dîrloman, F.M.; Toader, G.; Rotariu, T.; Țigănescu, T.V.; Ginghină, R.E.; Petre, R.; Alexe, F.; Ungureanu, M.I.; Rusen, E.; Diacon, A.; et al. Novel Polyurethanes Based on Recycled Polyethylene Terephthalate: Synthesis, Characterization, and Formulation of Binders for Environmentally Responsible Rocket Propellants. Polymers 2021, 13, 3828, doi.org/10.3390/polym13213828. Relevance: *especially important for Bio-HYPER-Shield because it connects polymer synthesis, recycled feedstocks, and performance-oriented formulation.*
4. Toader, G.; Diacon, A.; Rotariu, T.; Alexandru, M.; Rusen, E.; Ginghină, R.E.; Alexe, F.; Oncioiu, R.; Zorila, F.L.; Podaru, A.; et al. Eco–Friendly Peelable Active Nanocomposite Films Designed for Biological and Chemical Warfare Agents Decontamination. *Polymers* **2021**, *13*, 3999, doi.org/10.3390/polym13223999. **Relevance:** strong evidence for multifunctional nanocomposite film design, active interfaces, and defense-oriented protective materials.
5. Pulpea, D.; Rotariu, T.; Toader, G.; Pulpea, G.B.; Neculae, V.; Teodorescu, M. Decontamination of radioactive hazardous materials by using novel biodegradable strippable coatings and new generation complexing agents. *Chemosphere* **2020**, *258*, 127227, doi.org/10.1016/j.chemosphere.2020.127227. Relevance: *demonstrates advanced coating chemistry, hazard mitigation, and environmentally responsible protective materials.*
6. Rotariu, T.; Pulpea, D.; Toader, G.; Rusen, E.; Diacon, A.; Neculae, V.; Liggat, J. Peelable Nanocomposite Coatings: "Eco-Friendly" Tools for the Safe Removal of Radiopharmaceutical Spills or Accidental Contamination of Surfaces in General-Purpose Radioisotope Laboratories. *Pharmaceutics* **2022**, *14*, 2360, https://doi.org/10.3390/pharmaceutics14112360. Relevance: *shows integration of nanocomposite formulation, surface protection, and validation in realistic use scenarios.*
7. Toader, G.; Pulpea, D.; Rotariu, T.; Diacon, A.; Rusen, E.; Moldovan, A.; Podaru, A.; Ginghină, R.; Alexe, F.; Iorga, O.; et al. Strippable Polymeric Nanocomposites Comprising "Green" Chelates, for the Removal of Heavy Metals and Radionuclides. *Polymers* **2021**, *13*, 4194, doi.org/10.3390/polym13234194. Relevance: *competence in nanocomposite protective systems, green functional additives, and multifunctional barrier.*
*8. Toader, G.; Moldovan, A.E.; Diacon, A.; Dirloman, F.M.; Rusen, E.; Podaru, A.; Rotariu, T.; Ginghina, R.E.; Hoza, O.E. Effect of Aromatic Chain Extenders on Polyurea and Polyurethane Coatings Designed for Defense Applications. Polymers **2023**, 15, 756, doi.org/10.3390/polym15030756.* Relevance: *directly relevant to Bio-HYPER-Shield because it addresses defense-oriented coating design, structure-property tuning, and polymer systems related to impact-resistant and protective applications.*
9. Gavrila, A.M.; Iordache, T.V.; Lazau, C.; Rotariu, T.; Cernica, I.; Stroescu, H.; Stoica, M.; Orha, C.; Bandas, C.E.; Sarbu, A. Biomimetic Sensitive Elements for 2,4,6-Trinitrotoluene Tested on Multi-Layered Sensors. *Coatings* **2020**, *10*, 273, doi.org/10.3390/coatings10030273. Relevance: *showcases multilayer functional architectures and interfacial design in advanced materials systems.*
10. Lazau, C.; Iordache, T.-V.; Florea, A.-M.; Orha, C.; Bandas, C.; Radu, A.-L.; Sarbu, A.; Rotariu, T. Towards developing an efficient sensitive element for trinitrotoluene detection: TiO_2 thin films functionalized with molecularly imprinted copolymer films. *Applied Surface Science* **2016**, *384*, 449-458, doi.org/10.1016/j.apsusc.2016.04.187. Relevance: *it presents functional thin films, hierarchical interfaces, and validated performance in advanced material platforms.*

Narrative CV

Professor Traian Rotariu is a Romanian **chemical engineer** and **materials scientist** whose work has developed at the **interface** of *energetic materials*, *polymer chemistry*, *multifunctional composites*, and *defense-related technologies*. He obtained his PhD in Chemical Engineering from the University Politehnica of Bucharest with a thesis on energetic compounds obtained by chemical modification of polymers, establishing early **expertise** in the **synthesis of polymers** with energetic groups, energetic **plasticizers**, propellant and **explosive formulations**, and the **chemistry of advanced defense materials**.

Over nearly three decades at the Military Technical Academy "Ferdinand I", where he progressed from laboratory head to assistant professor, associate professor, full professor, and currently serves in the university leadership as *President of the University Senate*, he has built an interdisciplinary research profile combining *molecular design*, *formulation science, materials processing*, *testing*, and *technology/product validation*. His scientific work has consistently connected chemistry with application constraints specific to defense and security systems, especially where material performance, safety, environmental responsibility, and operational realism must be addressed simultaneously.

A **first major direction** of his work concerns **energetic materials**, including explosives, propellants, pyrotechnics, and related analytical and testing methods. In this area, he contributed to the synthesis and characterization of energetic compounds, environmentally responsible propellant formulations, and polymer-bonded explosive systems, while also engaging with lifecycle and environmental questions related to ammunition residues, demilitarization, and energetic-material management. This trajectory is especially relevant for **Bio-HYPER-Shield** because it demonstrates long-standing ***competence in designing materials for severe environments*** where mechanical integrity, controlled interfaces, thermal response, and safety are central.

A second major direction concerns **polymer chemistry** and **multifunctional materials**. His work in this area moved from *polymer synthesis* and *modification* toward *nanocomposites, polyurea and polyurethane systems,* peelable coatings, active decontamination films, recyclable and water-processable binders, and polymeric platforms capable of integrating multiple functionalities into a single material architecture. Recent outputs on *recycled-PET-based polyurethane binders*, *eco-friendly polymer-bonded explosives*, *strippable nanocomposite coating*s, and *defense-oriented polyurea/polyurethane coatings* show a coherent progression toward sustainable, high-performance materials with application-driven structure-property design.

A third defining element of his profile is the development of ***environmentally responsible defense materials and processes***. Through projects such as Environmentally Responsible Munitions and later work on greener propellants, decontamination technologies, and peelable active nanocomposites, he has helped shift research from conventional high-performance formulations toward solutions that also address toxicity, recoverability, waste minimization, and environmental impact. This is particularly important for the **Bio-HYPER-Shield** concept, which relies not only on **multifunctional protection** but also on **the design of chemically recyclable *and more sustainable polymer composite systems***.

His research profile is further strengthened by the **ability to work across disciplinary boundaries and institutional environments**. He has coordinated or led components of national, Ministry of Defence, European Defence Agency, Erasmus, and Horizon-linked projects, and has built collaborations with partners such as ENSTA Bretagne, Imperial College London, the University of Coimbra, Ludwig Maximilian University of Munich, and the University of Pardubice. These collaborations supported not only publications and patents, but also the development of international academic networks, educational initiatives, and technology transfer links with Romanian defense industry actors.

Alongside research, Professor Rotariu has had a sustained institutional and ***mentoring role***. He has served as head of academic committees, Erasmus institutional coordinator, vice-dean, vice-rector for international relations, department head, president of the university senate, and is currently part of the academic executive leadership. He has also acted as Romanian governmental expert in the European Defence Agency, national expert in NATO science and technology structures, organizer and scientific committee member for major conferences in energetic materials and ballistic systems, reviewer for international journals, and participant in numerous PhD and academic selection committees.

Overall, **the work with the greatest importance and impact is the creation of a coherent interdisciplinary platform** *linking energetic-materials chemistry, polymer design, nanocomposites, protective coatings, and environmentally responsible defense technologies*. **This platform now enables** the move toward **Bio-HYPER-Shield**, where the central scientific challenge is the design of ***hierarchical bio-based and chemically recyclable***

polymer composites delivering simultaneous ballistic, electromagnetic, and thermal protection. Professor Rotariu's past achievements show not only domain expertise, but also **the capacity to define and lead exploratory research at the interface of chemistry, materials science, and process engineering**.