

FUNDING APPLICATION
Section C – CV Template

C.1 CURRICULUM VITAE

Personal information

Name, Surname:	Gabriel Bușe		
Date of birth:	04.06.1981	Sex:	m
Nationality:	Romanian		
Researcher unique identifier(s) (ORCID, Researcher ID etc.):	https://orcid.org/0000-0003-2792-6383		
URL for personal website (if case):	-		

Education

Year	Faculty/department - University/institution - Country
2011 (dissertation defended)	Ph.D. in Physics/ Physics/ West University of Timisoara (University), Faculty of Physics, Romania
2006	Master in Physics of Crystalline Materials/ Physics/ West University of Timisoara (University), Faculty of Physics, Romania

Positions - current and previous

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

Year	Job title – Employer - Country
2022-	Scientific Researcher III-ICAM, West University of Timisoara-Romania
2019-2021	Scientific Research Assistant- Faculty of Physics, West University of Timisoara-Romania
2015-2018	Research engineer-CNRS-ICMCB-Bordeaux/France
2012-2014	Physicist – Post Doc-CNRS-ICMCB Bordeaux-France
2005-2011	Research assistant/ PhD student- West University of Timisoara (University), Faculty of Physics, Romania

Career breaks (if case)

Year	Reason
-	-

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
-	-

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
-	-

C.2 Track record of the last 10 years

1. High-Frequency Linear Array (20 MHz) Based on Lead-Free BCTZ Crystal
Claire Bantignies , Rémi Rouffaud , Gabriel Buse , Philippe Veber , Hugues Cabane, Ana Borta-Boyon, Mai Pham Thi, Pascal Mauchamp, A. Lejeune, Mario Maglione, Laurent Colin, Antoine Balé,
Martin Flesch, and Franck Levassort
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, vol. 71, no. 1, pp. 27-37, Jan. 2024
2. Spectroscopic Properties of Pb²⁺-Doped BaF₂ Crystals
Gabriel Buse, Marius Stef and Irina Nicoara
Crystals 2023, 13(4), 659
3. Analysis of site symmetries of Er³⁺ doped CaF₂ and BaF₂ crystals by high resolution photoluminescence spectroscopy
A.V. Racu, Z. Ristić, A. Ćirić, V. Đorđević, G. Buşe, M. Poienar, M.J. Gutmann, O. Ivashko, M. Ştef, D. Vizman, M.D. Dramićanin, M. Piasecki, M.G. Brik.
Optical Materials, Volume 136, February 2023, 113337
4. Electrochemical Investigation of the OER Activity for Nickel Phosphite-Based Compositions and Its Morphology-Dependent Fluorescence Properties
Maria Poienar, Paula Svera, Bogdan-Ovidiu Taranu, Catalin Ianasi, Paula Sfirloaga, Gabriel Buse, Philippe Veber, Paulina Vlazan
Crystals, 2022, 12, 1803.
5. Luminescence Properties and Judd–Ofelt Analysis of Various ErF₃ Concentration-Doped BaF₂ Crystals
Racu, Andrei, Stef Marius, Buse Gabriel*, Nicoara Irina, Vizman, Daniel
Materials, July 2021, vol. 14, issue 15, p. 4221
6. Growth and characterization of ErF₃ doped BaF₂ crystals
Nicoara Irina, Stef Marius, Buse Gabriel, Racu Andrei
Journal of Crystal Growth, July 2020, 547:125817
7. Spectroscopic properties of the gamma irradiated ErF₃-DOPED BaF₂ crystals
Marius Stef, Irina Nicoara, Andrei Racu, Gabriel Buse, Daniel Vizman
Radiation Physics and Chemistry, November 2020, Volume 176, , 109024
8. Spinodal Decomposition in Lead-free Piezoelectric BaTiO₃-CaTiO₃-BaZrO₃ Crystals
Buse, G., Xin, C., Marchet, P., Borta-Boyon, A., Pham-Thi, M., Cabane, H., Veron, E., Josse, M., Velazquez, M., Lahaye, M.,
Lebraud, E., Maglione, M., Veber, P.
Crystal Growth and Design 2018, 18 (10), pp 5874–5884

9. Influence of Yb³⁺ ions on the optical properties of double-doped Er,Yb: CaF₂ crystals
G. Bușe, E. Preda, M. Ștef, I. Nicoară
Physica Scripta, Volume 83, Number 2, 025604, (2011)
10. International patent in the field of crystal growth" PROCEDE DE PREPARATION DE SESQUIOXYDES CUBIQUES MONOCRISTALLINS ET APPLICATIONS – Patent No. 14/903,761"

C.3 Narrative CV

I have the graduate the faculty of Physics with Physics-Chemistry specialization 200, the master's degree in "Physics of Crystalline Materials" graduation 2006.

In 2011, I successfully defended my **doctoral thesis** in the field of Physics with the thesis entitled "Study of some physical properties of CaF₂ crystals double doped with ErF₃ and YbF₃". The doctoral thesis was carried out under the coordination of Mrs. Prof. Univ. Dr. Irina Nicoara. During my doctoral studies, I also held the position of Research Assistant at the West University of Timișoara, Faculty of Physics under a contract (CEEX72/2006). Main activities and responsibilities were related to crystal growth of optical crystals of fluorides (CaF₂, BaF₂) doped with rare earths (Yb³⁺, Er³⁺) and double doped (Yb³⁺ + Er³⁺), for laser application; growth of multi crystalline silicon for photovoltaic applications; structural characterization of crystals, microscopic study of crystalline defects; atomic force microscopy of crystalline defects; dielectric measurements; Judd-Ofelt analysis; absorption, emission and excitation spectroscopy. My thesis presented subjects that covered aspects related to the analysis of the physical properties of the laser active media that are of great interest, both theoretically as well as from a practical point of view, and open the path for the prediction of new materials that can be used in the construction of lasers. The objective of the thesis was to study the physical properties of calcium fluoride fluoride doped with Er³⁺ ions and co-doped with Yb³⁺ ions. The subject is addressed both experimentally and theoretically through the Judd-Ofelt type analysis in the CaF₂ matrix with a more detailed analysis for Er³⁺ and Yb³⁺ ions and for Er³⁺/Yb³⁺ ions double doped systems. The results highlight the existence of intense transitions for the blue, green and red strips. These results in spectroscopically properties shown for the doubly doped CaF₂ matrix with Yb³⁺/Er³⁺ ions have not been reported by other researchers and were published in 9 articles, 3 in ISI.

From 2012 to 2014 I worked as a **post-doctoral** researcher in France at the Institute of Chemistry of Condensed Matter Bordeaux (ICMCB), department "Crystal growth and characterization; High pressure; Thermal treatments", the RESONATE ANR France project, in collaboration with FEE GmbH (Germany) and the Optics Institute of Palaiseau (France). I was in charge of crystal growth by flux method of laser crystals of sesquioxides (Gd₂O₃, Y₂O₃, Lu₂O₃, Sc₂O₃ doped with Yb³⁺ or doped with Tm³⁺) structural characterization of crystals, microscopic study of crystalline defects; cutting, polishing and crystal orientation with Laue method; measurements of refractive index; structural analysis by x-ray diffraction; SEM, EDS microscopy; EPMA analysis; absorption, emission, excitation spectroscopy near UV, visible, near IR and life time measurements. In the project RESONATE we have developed laser grade and highly Yb³⁺-doped cubic rare-earth sesquioxides (RE₂O₃, RE = Y, Gd, Lu) single crystals by means of a newly designed high-temperature solution growth method which gives them spectroscopic properties different from those obtained by high-temperature solidification methods. We have shown that Yb³⁺-doped cubic RE₂O₃ (RE = Y, Gd, Lu) single crystals grown by the widely spread flux method, using an original and nontoxic solvent, and growth setup design operative in air and at half the melting temperature of these compounds, can be optimally doped for high-power laser applications, without OH groups dissolution, without Yb³⁺ ions reduction into Yb²⁺ ones and with broader absorption and emission lines in the NIR spectral range.

Between 2015 and 2017 I worked within the HECATE project (High Efficiency Piezoelectric Alternative materials: Towards Environmental-friendly solutions) as a CNRS **research engineer** in France at ICMCB, as well as at the company "CRISTALINNOV-Montmelian". The topic we covered was related to crystal growth by TSSG, SSSG and Czochralski flux method of lead-free piezoelectric crystals; development and construction of different configurations of thermal installations necessary for the growth of these crystals; characterization of the physical properties of crystals; microscopic study of crystal defects; cutting, grinding and orienting crystals by the Laue method; structural analysis by X-ray diffractometry; dielectric and piezoelectric characterization of crystals, technological transfer of crystals obtained from a research institute in a factory for micro-production. That studies of HECATE project have developed around the crystal growth attempts in the BaTiO₃–CaTiO₃–BaZrO₃ pseudoternary system by TSSG. Centimeter-sized single crystals were obtained. Numerous samples with various compositions have been extracted and shaped in order to perform suitable chemical and physical analysis. EPMA analysis of BCTZ crystals revealed that the as-grown crystals are enriched with zirconium and barium compared to the initial content because of the difference of elemental effective partition coefficients in the crystal. Close to the composition range of interest for piezoelectric applications, we observed that a spinodal decomposition occurred during the growth, leading thus to the emergence of two solid solutions of close compositions, although variations and periodical fluctuations of Ca and Zr induced lower piezoelectric values than those expected, this result could be considered as a first step toward further optimization of the piezoelectric properties of BCTZ single crystals.

Since 2019, I have held the positions of **Research Assistant and Scientific Researcher III** at the Faculty of Physics and ICAM, Western University of Timisoara. I am responsible for the crystal growth laboratory, growth and characterization of monocrystalline materials obtained by by Bridgman, Czochralski, TSSG, SSSG, EFG and hydrothermal methods. The subjects covered are in the field of fluoride (CaF₂, BaF₂, LiF) doped with rare earth ions for laser applications.

I am the author and co-author of 32 scientific articles, of an international patent concerning obtaining new crystalline materials, participation in more than 30 scientific conferences.

I also had various didactic activities during the academic years 2006-2023 within the Faculty of Physics, Western University of Timișoara.

Note: For each nominated person, please present the CV (uploaded as a single document of maximum 6 pages, saved with the name of the member, A4 format, Times New Roman font, 11-point font size, 1.15 line spacing and 2 cm margins).