

# BUZATU DANIELA

Department of Physics, Faculty of Applied Sciences, University Politehnica of Bucharest  
Splaiul Independentei 313, R-060042, Bucharest, Romania.

Tel. +40-21-4029102, +40-723501657

Fax +40-21-4029120

E-mail: daniela.buzatu@physics.pub.ro.

## CURRICULUM VITAE

Born (Draghici) on April 14 1958, in Fagaras, Brasov

### 1. Education

- 1991-1995 PhD in Technical Physics - Elementary particles Title: „*Study of interactions between antiprotons, nucleons and light nuclei at rest*” University „Politehnica” of Bucharest, Applied Science, Department of Physics, Splaiul Independentei 313, sector 6, Bucharest, Romania
- 1977-1982 Faculty of Physics , University Bucharest, Romania  
Specialization : Physics engineer (Mathematics, General Physics, Mechanics, Electromagnetism, Optics, Quantum mechanics, Nuclear Physics, Physics of Elementary Particles, Physics of Solids, Defectoscopy :

### Positions

- 2007-present Professor Physics Department, University Politehnica of Bucharest
- 2002-2007 Associate Professor Physics Department, University Politehnica of Bucharest;
- 1997-2002 Lecturer Physics Department, University Politehnica of Bucharest;
- 1988-1997 Assistant Professor Physics Department, University Politehnica of Bucharest
- 1984- 1988 - physics engineer - Research institute for wastewater treatment . Bucharest, Romania , research work in transport phenomena in liquids
- 1982 - 1984 - professor of physics at high school – didactic work

### 2. Research activity

**1991-1996** I was working as researcher and principal researcher in the International Institute for Nuclear Research, Dubna- Russia , OBELIX collaboration, experiment PS-201; the thematic of research: *Study of interactions of antiprotons with the nucleons and light nuclei at low energy at*

*the OBELIX spectrometer* . The research activity was developed in the following directions:  
1. *the theoretical study of the Pontecorvo reaction*; 2. *the theoretical study for violation rule Okubo-Zweig-Iizuka (OZI)*.

**1998-2001** I was working as associate researcher at Texas Christian University , USA , Chemistry department in chemistry-physics – irreversible thermodynamics field. The research activity was developed in the following directions: 1. *The theoretical study of spinodal curve base on Wheeler-Widom model with three bodies interactions*; 2. *The theoretical and experimental study of multicomponent (ternary) diffusion (protein-water-chloride salt)- Lysozyme- $\text{Na}_2\text{SO}_4$ -water,; the determination of diffusion coefficients using the Gosting diffusimeter based on Rayleigh interferometry; the study of diffusion implications in proteic crystal growth in microgravity conditions*; 3. *The theoretical and experimental study for viscosity and electrical conductivity for ternary solutions protein-water – salts , looking for electrical charge of protein. (lysozyme)*.

**2011-2013** I was working researcher in the nanoparticles field in the Centre for Surfaces Science and nanotechnology from Politecnica University . The research activity was developed in the following directions: 1. *Determination of the dielectric constant for insulating materials by an atomic force microscopy technique (AFM)*; 2. *Determination of wetting properties of glycerol on silicon, native  $\text{SiO}_2$  and bulk  $\text{SiO}_2$  by Scanning Polarization Force Microscopy (SPFM)* 3. *Determination of contact angle and disjoining pressure of glycerol and sulfuric acid on highly oriented pyrolytic graphite and aluminium using SPFM*; 4. *Multifractal Analysis of  $\text{CoFe}_2\text{O}_4$ /Lauric Acid/DDS-Na/ $\text{H}_2\text{O}$  Ferrofluid from Transmission Electron Microscopy (TEM)*

**2015-present** I was working in the radioprotection field using the Fluka interface

### **Projects:**

- 1). CERES 4-163/2004 project, Strong correlated fermions investigated by many body methods , (2004-2006), responsible UPB
- 2.) CEEEX- (SNCRF) 2 CEEEX-06-11-3/25.07.2006, project, Complete Nuclear spectroscopy by reactions with light targets, fragmentations and fission , (2006-2009) , responsible UPB
- 3). COOPBIL project (International bilateral project Romania-Italia) C-18002/2006 (2006-2008) Title : Phase transitions and transport phenomena in amphiphilic ternary solutions, Foreigner partner: University Federico II Naples, Italy
- 4) CERES 4-164/2004 project ; Title : Phase transitions in amphiphilic ternary systems , responsible UPB
- 5) 5/5.1/ELI-RO project Title FLUKA-based radiation shielding and monitoring optimization at ELI-NP / ELIFLUKA 2016-2019 - - collaboration

## List of publications

1. Cristina Stan, Maria Balasoiu, **Daniela Buzatu**, and C. P. Cristescu, Multifractal Analysis of  $\text{CoFe}_2\text{O}_4$ /Lauric Acid/DDS-Na/ $\text{H}_2\text{O}$  Ferrofluid from Transmission Electron Microscopy Measurements, **J. Comput. Theor. Nanosci.** Volume 14, Number 4, April 2017, pp. 2030-2034(5)
2. A. Moldovan, **Daniela Buzatu**, M. Enăchescu, Determination of the local dielectric constant of insulating materials by an atomic force microscopy technique, **UPB Sci. Bull. Series A.** Vol.78, Nr 1, 257-264, **2016**, ISSN: 1223- 7027
3. A. Moldovan, P.M. Bota, I. Boerasu, D. Bojin, **Daniela Buzatu**, M. Enachescu, Wetting properties of glycerol on silicon, native  $\text{SiO}_2$  and bulk  $\text{SiO}_2$  by Scanning Polarization Force Microscopy, **Journal of Adhesion Science and Technology**, Vol. 28, Issue 13, 277-1287, **2014**, ISSN: 0169-4243
4. Moldovan, A; Bota, PM; Boerasu, I; Dorobantu, D; Bojin, D; **Buzatu, D**; Enachescu, M; "Wetting properties of glycerol on mica and stainless steel by scanning polarization force microscopy"; , **J.Optoelectron Adv.Mat** **2013**, 15, 1105
5. Moldovan, A; Bota, PM; Poteca, TD; Boerasu, I; Bojin, D; **Buzatu, D**; Enachescu, M; "Scanning polarization force microscopy investigation of contact angle and disjoining pressure of glycerol and sulfuric acid on highly oriented pyrolytic graphite and aluminum"; **European Physical Journal Applied Physics** **2013**, 64, 31302
6. Onofrio Annunziata, **Daniela Buzatu**, and John G. Albright , Protein Diffusiophoresis and Salt Osmotic Diffusion in Aqueous Solutions, **J. Phys. Chem. B**, **2012**, 116 (42), pp 12694–12705
7. Onofrio Annunziata, **Daniela Buzatu** , and John G. Albright, Effect of Lysozyme Proteins on the Mutual-Diffusion Coefficient of Sodium Chloride in Water, **J. Chem. Eng. Data**, **2011**, 56 (12), pp 4849–4852
8. **D.Buzatu**, F.D.Buzatu, R.P.Lungu, L. paduano, R.Sartorio, “On the determination of the spinodal curve for the system water+ chloroform+ acetic acid from the mutual diffusion coefficients”, **Rom.J.Phys.**, **55** , **2010**- 342-351, ISSN: 1221-146-x
9. F. D. Buzatu, R. P. Lungu, **D. Buzatu**, Roberto Sartorio, Luigi Paduano, “ Spinodal composition for the system Acetic acid – chloroform – water at 25 °C.” , **Journal of Solutions Chemistry** 38: 403–415, **2009**, (FI=1.228/2004) , ISSN: 0095-9782
10. F.D.Buzatu, **D.Buzatu**, Site density waves vs. bond density waves in the one-dimensional ionic Hubbard model in the high ionicity limit, **Rom.Journ.Phys.**, Vol 53, No 9-10, pg. 1045-1052, **2008**, ISSN: 1221-146-x

11. **D.Buzatu**, F.D.Buzatu, R.Sartorio, "Partial molar volumes and diffusion coefficients for ternary system water-chloroform-acetic acid at 25 C for different choices of solvent" **UPB. Sci.Bull.** Series A. Vol.70, Nr 4, **2008**, ISSN: 1223- 7027
12. F.D.Buzatu, **D.Buzatu**, "One dimensional ionic Hubbard model in the high ionicity limit" **Romanian Reports in Physics**, Vol. 59, nr.2, pag.351-356, **2007**, ISSN: 1221-146-x
13. **D.Buzatu**, F.D.Buzatu, L.Paduano, R.Sartorio "Diffusion coefficients in the ternary system water-chloroform-acetic acid at 25°C." *Journal of Solutions Chemistry*, Vol. 36 , Nr. 11-12, (**2007**), (FI=1.228/2004) , ISSN: 0095-9782
14. **D.Buzatu**, A.M.Popovici, F.D.Buzatu, L.Paduano, R.Sartorio, "Hydrodynamic and thermodynamic aspects of diffusion coefficients in the ternary system water chloroform-acetic acid at 25°C", **Sci.Bull.UPB**, Vol. 69, nr 3, pag 73-80, (**2007**) **ISSN: 1223-7027**
- 15 . R.Lungu, D.Huckaby, F.D.Buzatu, **D.Buzatu**, "Three-body and bonding effects on phase separation in a model binary solution" **Romanian Journal of Physics**, Vol.51, p. 769-782, (**2006**), **ISSN: 1221-146-x**
16. **D.Buzatu** O. Annunziata, E.Petrescu, C.Popa, F.D.Buzatu, "Dynamic light scattering: a useful optical method to probe common-ion effects in protein - salt aqueous solutions" , **J.Optoelectron Adv.Mat**, Vol.7 (6), p 3161-3168, (**2005**), **ISSN:1454-4164 (FI=1.138/2005**
17. Onofrio Annunziata, **D. Buzatu**, John G. Albright "Protein Diffusion coefficients determined by Macroscopic-Gradient Rayleigh Interferometry and Dynamic Light Scattering", **Langmuir**, Vol 21, pag. 12085-12089, (**2005**), ISSN:0743-7463 (FI=3.707/2005) .
18. **Buzatu**, Popa, E.Petrescu, F.D.Buzatu, "Determination of the diffusion coefficients for ternary systems from Gosting difussiometer; apparatus and method", **J.Optoelectron Adv.Mat**, Vol.7, Nr.2, 1079-1090, (**2005**), **ISSN:1454- 4164 (FI=1.138/2005)**
19. **D. Buzatu**, C.Popa, E. Petrescu, F.D. Buzatu, « Conductimetric method applied to Lysozyme and Lysozyme-NaCl-Water Solution », **Revue Roumaine de Chimie**, Vol 50, Nr 3, pag. 193-199, (**2005**), **ISSN: 0035-3930 (FI=0.199/2004)**
20. **D. Buzatu**, C.Popa, E.Petrescu, F.D.Buzatu, « Conductimetric method applied to ternary Lysozyme-KCl-Water Solution and Lysozyme-NH<sub>4</sub>Cl-Water Solution », **Revue Roumaine de Chimie**, Vol. 50 (3) , pag. 185-191, (**2005**), **ISSN: 0035-3930 (FI=0.199/2004)**
21. **D. Buzatu**, E. Petrescu, C. Popa, F.D.Buzatu " Conductivity and viscosity measurements for binary lysozyme chloride aqueous solution and ternary lysozyme-salt-water solution", **Revista de Chimie**, Vol. 56 (1), pag. 61- 65, (**2005**) , **ISSN: 0034-7752 (FI=0.308/2004)**
22. F.D.Buzatu, R.P.Lungu, D.A Huckaby, **D. Buzatu**, "A Three component Molecular Model with Bonding Three-Body Interactions", **Romanian Journal of Physics**, Vol. 50, Nr.3-4, pag. 417-425, (**2005**), **ISSN: 1221-146-x**

- 23. D. Buzatu**, E. Petrescu, C. Popa, F.D. Buzatu, J.G. Albright, "Extraction of Thermodynamic Data from Ternary Diffusion Coefficients of Lysozyme Chloride in Water and Aqueous Na<sub>2</sub>SO<sub>4</sub>", **Revista de Chimie**, Vol. 55 (10) Pag. 759-763, (2004), ISSN: 0034-7752 (FI=0.308/2004)
- 24. D. Buzatu**, « Rayleigh optical interferometric method applied to ternary Lysozyme-Na<sub>2</sub>SO<sub>4</sub>-Water Solution », **Sci.Bull.UPB**, Vol.66, No. 2-4, pag. 85-94, (2004), ISSN: 1223-7027
- 25. D. Buzatu**, E. Petrescu, C. Popa, F.D. Buzatu, J.G. Albright, "Measurements of multicomponent diffusion coefficients for lysozyme chloride in water and aqueous Na<sub>2</sub>SO<sub>4</sub>", **Revista de Chimie**, Vol. 55 (6), pag. 435-438, (2004), ISSN: 0034-7752 (FI=0.308/2004)
- 26. D. Buzatu** "Conductimetric applied to binary Lysozyme Chloride-Water Solution", **Sci.Bull. UPB**, Vol. 66, No.2-4, pag. 47-56, (2004), ISSN: 1223-7027
- 27. F.D. Buzatu, D. Buzatu**, "Antiferromagnetic-like ordering in a model ternary solution", **Romanian Journal of Physics**, Vol. 48, Supplement I, P. pag 521-532, (2003), ISSN: 1221-146-x
- 28. F.D. Buzatu, D. Buzatu, J.G. Albright**, "Spinodal curve of the Wheeler-Widom model with three-body interactions on the Bethe Lattice", **Romanian Journal of Physics**, Vol. 47, nr. 3-4, pag. 359-370, (2002), ISSN: 1221-146-x
- 29. F.D. Buzatu, D. Buzatu**, "Effective spinodal curve of a three-component molecular system", **Romanian Journal of Physics**, Vol. 47, nr. 1-2, pag. 293-305, (2002), ISSN: 1221-146-x
- 30. F.D. Buzatu, D. Buzatu, J. G. Albright**, "Spinodal curve of a model ternary solution", **Journal of Solution Chemistry**, Vol. 30, No 11, pag. 969-983, (2001) ISSN: 0095-9782 (FI=0.966/2001)
- 31. D. Huckaby, A. Pekalski, D. Buzatu, F.D. Buzatu**, "Amphiphile-rich phase in a model ternary solution on the honeycomb lattice", **Journal of Chemical Physics**, Vol 115, No 14, pag. 6775-6779, (2001), ISSN:0021-9606 (FI=3.147/2001)
- 32. D. Buzatu F.M. LEV**, "Manifestation of the Delta ++ resonance in the reaction antiproton-deuteron", **Phys. Of Atomic Nuclei** 60, 1186-1192, (1997) ISSN: 1063-7788 (FI=0.208/1997)
- 33. D. Buzatu, F.M. LEV**, "J/Psi decays as a test of OZI-rule violation in nucleon-antinucleon annihilation", **Hadronic Journal** 20, 615-619, (1997), ISSN:0162-5519 (FI=0.96/(1974-2001)
- 34. D. BUZATU, F.M. LEV**, "Okubo-Zweig-Iizuka rule violation in the reaction antiproton-proton with Phi meson production"- Replay", **Physical Rev. C** 53, 1453-1453, (1996), ISSN:0556-2813 (FI=2.07/(1974-2001)

**35. Buzatu, F.M. LEV**, “Some aspects of the OZI-rule violation in the reaction proton-antiproton resulting  $\Phi$ - $\pi$  mesons production”, **Physics of atomic Nuclei** 59(2), 280-288, (1996) ( traducere din Yadernaia Fizika 59, 300-308, **1996**) ISSN: **1063-7788 (FI=0.28/(1994-2001**

**36.D. Buzatu, F.M. LEV**, “The problem of the OZI-rule violation in the reaction antiproton-proton with the production of  $f'$  resonance”, **Physics Lett. B** 359 (3-4) , 393-396, (**1995**) , ISSN: **0370-2693 (FI=3.62/1974-2001**

**37. D. Buzatu, F.M. LEV**, “The OZI-rule violation in the reaction antiproton-proton with the production of  $\Phi$  meson”, **Physical Rev. C** 51 (6) , 2893-2895, (**1995**), ISSN:**0556-2813 (FI=2.07/(1974-2001)**

**38. D. Buzatu, F.M. LEV**, “Violation of the Okubo-Zweig-Iizuka rule in the annihilation of slow antiprotons on deuteron”, **Physics of Atomic Nuclei** 58(3), 480-483, (1995) ( translated from Yadernaia Fizika, 58 (3), 531-535, 1995 “О нарушении правила Окубо-Цвейга-Изуки в аннигиляции медленных антипротонов на дейтроне” ) , ISSN: **1063-7788 (FI=0.162/1995)**,

**39. D. Buzatu, F.M. LEV**, “A simple mechanism of the Pontecorvo reaction”, **Phys.of Atomic Nuclei** in traducere USA 57(6), 1000-1003, (1994) (traducere Yadernaia Fizika 57, 1061-1064, 1994 “Простой механизм реакции Понтекорво” ) , ISSN: **1063-7788 (FI=0.068/1994)**

**40. D. Buzatu, F.M. LEV**, “On the role of  $KK^*$  intermediate states in Okubo- Zweig-Iizuka -rule violating reactions of antiproton annihilation”, **Physics Lett.B** 329(1), 143-148, (**1994**), ISSN: **0370-2693 (FI=3.62/(1974-2001 )**

**41. Buzatu, T.CRETU**, “Simple mechanism of Pontecorvo of Pontecorvo reaction”, **Sci.Bull.UPB Series A** 56, NR. 3-4, 105-109, (**1994**), ISSN: **1223-7027**

**9 books – 3 courses** of physics for students, **4 applications** in physics for students , **1 monography**: **D. Buzatu & F.M. Lev**, “*Problems with the OKUBO-ZWEIG-IIZUKA rule violation in nucleon-antinucleon annihilation at rest*”, Phys of Part Nuclei 29 (1), pag.212-251, (1998,) Editura ECIAIA, DUBNA, Rusia, FI=0.49, ISSN:1063-7796 and **1 scientific book** **D.Buzatu, E. Petrescu, F.D. Buzatu** “*Optical and electronical methods applied to ternary protein solutions*” Ed. BREN , **107** (2007) Bucharest, ISBN 978-973-648-641-8 .

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- General Physics
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