

# *Curriculum Vitae*

## *Yuliya Lyubomirova Genova*

**Date of birth:** 14. 07. 1974

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### ***Education:***

28.05.2009 –till now - Assistant Prof. at Institute of Solid State Physics, Bulgarian Academy of Sciences

2008- PhD Thesis: “Influence of sugars on the elastic properties of lipid membranes”

2001 – 2006 PhD student at the Laboratory of Liquid Crystals, Institute of Solid State Physics, Bulgarian Academy of Sciences under the leadership of Assoc. Prof. Dr. Marin Mitov ;

01.01.1999-31.06.2001 - physicist at the Laboratory of Liquid Crystals, Institute of Solid State Physics, Bulgarian Academy of Sciences ;

1998- MSc degree in Physics ("Evolution of density unhomogenidities and structures of antimatter", Institute of Astronomy, Bulgarian Academy of Sciences under the leadership of Dr D. Kirilova, ) ;

1993-1998 - MSc studies at Sofia University, Faculty of Physics, Department of Astronomy

1993- graduated English language school "L.Dimitrova", Sofia

### ***Specializations:***

September 2009 visiting scientist at Laboratory of Biophysics, Faculty of Electrical Engineering, University of Ljubljana, Ljubljana

October-November 2010- visiting scientist at Laboratory of Biophysics, Faculty of Electrical Engineering, University of Ljubljana, Ljubljana

### ***Languages:***

English- spoken and written, Russian- spoken and written, Bulgarian-mother language and low communicative level of French, German, Spanish and Slovenian

### ***Publications:***

1) V. Vitkova, J. Genova and I. Bivas, "Pores - Possible Mechanism of Communication Between the Two Sides of a Bilayer Under Tension" , Materials for Information Technology in the New Millennium, A.G. Petrov and J. Marshal eds., World Scientific, Singapore, pp 448–451, (2000);

2) V. Vitkova, J. Genova and I. Bivas, “Experimental and Theoretical Study of Lipid Bilayers Permeability and Hidden Area”, C. R. Acad. Bulg. Sci. **55** (10) pp 15-20 (2002)

3) V. Vitkova, J. Genova and P. Méléard, “Influence of alamethicin on the passive water permeability of model lipid membranes and on the morphology of giant lipid vesicles”, J. Mater. Sci.: Mater. El. **14** (10-12) pp 819-820 (2003);

4) J. Genova, V. Vitkova, L. Aladgem, P. Meleard, M. D. Mitov, “Using Stroboscopic Illumination to Improve the Precision of the Bending Modulus Measured by the Analysis

- of Thermally Induced Shape Fluctuations of Giant Vesicles”, *Bulg. J. Phys.* **30** (2003);
- 5) V. Vitkova, J. Genova and I. Bivas, “Permeability and Hidden Area of Lipid Bilayers”, *Eur. Biophys. J.* **33** (8) pp 706-714 (2004);
- 6) V. Vitkova, J. Genova, M.D. Mitov, and I. Bivas, “Mechanical Properties of Lipid Mono- and Bilayers in the Presence of Small Carbohydrates in the Aqueous Phase”, *C. R. Acad. Bulg. Sci.* **57** (6) pp 55-60 (2004);
- 7) V. Vitkova, J. Genova, O. Finogenova, M.D. Mitov, Y. Ermakov and I. Bivas, “Surface Charge Effect on the Bending Elasticity of Lipid Bilayers”, *C. R. Acad. Bulg. Sci.* **57** (11) pp 25-30 (2004);
- 8) J. Genova, V. Vitkova, L. Aldjem, P. Méléard, M.D. Mitov, “Stroboscopic Illumination Gives New Opportunities and Improves the Precision of Bending Elastic Modulus Measurements”, *Journal of Optoelectronics and Advanced Materials*, **7**,(1), pp 257-260 (2005);
- 9) V. Vitkova, J. Genova, M. D. Mitov, and I. Bivas, “Sugars in the Aqueous Phase Change the Mechanical Properties of Lipid Mono- and Bilayers”, *Mol. Cryst. & Liq. Cryst.*, **449**, pp 95-106 (2006);
- 10) J. Genova, A. Zheliaskova, M.D. Mitov, “The influence of sucrose on the elasticity of SOPC lipid membrane studied by the analysis of thermally induced shape fluctuations”, *Colloids & Surfaces A*, **282-283**, pp 420-422 (2006);
- 11) J. Genova, A. Zheliaskova, M.D. Mitov, “Mono- and disaccharides influence elasticity of lipid membranes”, *Journal of Optoelectronics and Advanced Materials*, **9**, (1- 2), pp.427-430 (2007).
- 12) J. Genova, A. Zheliaskova, M. D. Mitov „Influence of Hydrocarbon Inclusions on the Elasticity of SOPC Membrane” *C. R. Acad. Bulg. Sci.* **61**(7), pp 879-884 (2008);
- 13) J. Genova, A. Zheliaskova, V. Vitkova, and M.D. Mitov, “Stroboscopic Illumination Study of the Dynamics of Fluctuating Vesicle”, *Journal of Optoelectronics and Advanced Materials*, **11**, (9), pp 1222-1225 (2009).
- 14) J. Pavlic, J. Genova, A. Zheliaskova, M.D. Mitov, “Electroformation of neutral and negatively charged phospholipids vesicles under physiological conditions”, *C. R. Acad. Bulg. Sci.* **63** (4), pp. 497 -502 (2010).
- 15) J. Genova, A. Zheliaskova, M. D. Mitov „Does Maltose Influence the Elasticity of SOPC Membrane? *J. Phys.: Conf. Ser.* **253** 012063 (2010).
- 16) J. Pavlic, J. Genova, A. Zheliaskova, M.D. Mitov „Bending Elasticity of Lipid Membrane in Presence of Beta 2 Glycoprotein I in Its Membrane”, *J. Phys.: Conf. Ser.* **253** 012064 (2010).
- 17) J. Pavlič, J. Genova, G. Popkirov, A. Iglič, V. Kralj-Iglič M. D. Mitov, “Mechanoformation of neutral (SOPC) giant phospholipid vesicles in high ionic strength solution (PBS)”, *Chem. & Phys. Of Lipids* **164** pp. 727-731 (2011).
- 18) J. Genova, J. Pavlič, A. Zheliaskova, V. Kralj-Iglič, A. Iglič, and M. D. Mitov, “Vesicles with Tethers in Symmetrical and Non symmetrical conditions” *Biotech. Equip.* **26** (1), pp. 205-208 (2012).
- 19) J. Genova, J. Pavlič, “REALIZATION OF MARIN MITOV’S IDEA FOR THE STROBOSCOPIC ILLUMINATION USED IN OPTICAL MICROSCOPY”, *Bulg. J. Phys.* **39**(1), pp.065-071 (2012).
- 20) J. Genova, V. Kralj-Iglič, A. Iglič, R. Marinov, I. Bivas, “Influence of Cholesterol on the Elastic Properties of Lipid Membranes” *J. Phys.: Conf. Ser.* (in press).
- 21) J. Genova, N. Ulrich, V. Kralj-Iglič, R. Marinov, I. Bivas, “Bending Elasticity of Archeosomes” *Biomembranes*. (in preparation).

22) P. B. Santhosh, S. Penič, J Genova, A. Iglič , V. Kralj-Iglič and N. P. Ulrih, “A study on the interaction of nanoparticles with lipid membranes and their influence on membrane fluidity” *J. Phys.: Conf. Ser.* (in press).

23) Julia Genova: Marin Mitov lectures: Measuring bending elasticity of lipid bilayers, *APLBL* 17 (2013) (in preparation).

***Presentations:***

11-th International School on Condensed Matter Physics, Varna, Bulgaria, September 03-11, 2000

5-th National Congress of Biochemistry and Biophysics, Sofia, Bulgaria, March 29-31, 2001

12-th International School on Condensed Matter Physics, Varna, Bulgaria, September 01-06, 2002

13-th International School on Condensed Matter Physics, Varna, Bulgaria, August 30-September 3, 2004

8-th European Liquid Crystal Conference, Sixteen-Sesto, Italy, February 27-March 4, 2005

14-th International School on Condensed Matter Physics, Varna, Bulgaria, September 2006

International Workshop in Gomadingen, Baden-Württemberg, Germany ”Mechanical and Electrical Properties of Artificial and Cellular Membranes” 31<sup>st</sup> March - 2<sup>nd</sup> April 2008

15-th International School on Condensed Matter Physics, Varna, Bulgaria, September 2008

16-th International School on Condensed Matter Physics, Varna, Bulgaria, September 2010

50-th Anniversary Conference of the Institute of Molecular Biology, Rumen Canev, Sofia 2011.

17-th International School on Condensed Matter Physics, Varna, Bulgaria, September 2012

**Member of the projects:**

- 1998 – 2004 – French–Bulgarian Laboratory “Vesicles and Membranes” (between the Centre National de la Recherche Scientifique, France, and the Bulgarian Academy of Sciences, and Sofia University, Bulgaria);

- 1998 – 2003 – Scientific contract with the Bulgarian National Science Foundation (contract F – 823);

- 1999 – 2002 – Bilateral scientific contract between the Russian Academy of Sciences and the Bulgarian academy of Sciences: “Influence of surface electrical charges on the mechanical properties of lipid monolayers and bilayers”;

- 2001 – 2003 – Joint research project between the Institute of pharmacology and structural biology, CNRS, France, and the Institute of Solid State Physics, Bulgarian Academy of Sciences: “Mechanical and Electromagnetic Properties of Lipid Monolayers”;

- 2002 – 2005 – Scientific contract with the Bulgarian National Science Foundation (contract MUF – 1203);

- 2005 – 2009 – Scientific contract with the Bulgarian National Science Foundation: “Mechanical and flexoelectric properties and phenomena in thermotropic and lyotropic liquid crystal systems” (contract F – 1506);
- 2009 – 2010 – Scientific contract with the ISSP-BAS: “Thermally induced shape fluctuation study of the influence of sugars on the elasticity of lipid membranes”;
- 2007 – 2009 – Bilateral scientific project in the frames of BAS and Slovenian Academy of Sciences' convention: “Analysis of thermal shape fluctuations of giant vesicles - tool for investigations of the properties of their membranes”;
- 2009 – 2010 – Scientific contract with the Bulgarian National Science Foundation: “Shapes and shape fluctuations of lipid vesicles - tool for investigations of the properties of their membranes” (contract NTS01-121).

#### **Chief of the scientific project:**

VK 01-09 with ISSP: Influence of sugars on elastic properties of lipid membranes

VK 03-11 with ISSP: Influence of cholesterol mechanical properties of lipid membranes

#### **Awards:**

- Best scientific achievement of the Institute of Solid State Physics (BAS) – second place – for the study: “Permeability and Hidden Area of Lipid Bilayers” with authors: V. Vitkova, J. Genova and I. Bivas, (published in Eur. Biophys. J. 33 (8) pp 706-714 (2004)
- Best scientific achievement of the Institute of Solid State Physics (BAS) – third place – for the study: “Electroformation of neutral and negatively charged phospholipids vesicles under physiological conditions”, C. R. Acad. Bulg. Sci. **63** (4), p. 497 (2010) with authors: J. Pavlic, J. Genova, A. Zheliaskova, M.D.Mitov,
- Best scientific achievement of the Institute of Solid State Physics (BAS) – first place – for the study: “Mechanoformation of neutral (SOPC) giant phospholipid vesicles in high ionic strength solution (PBS)”, *Chem. & Phys. Of Lipids* **164** 727-731 (2011).with authors: J. Pavlič, J. Genova, G. Popkirov, A. Iglíč, V. Kralj-Iglíč M. D. Mitov,
- The publication (Mechanoformation of neutral giant phospholipid vesicles in high ionic strength solution *Chem. & Phys. Of Lipids* **164** 727-731 (2011).with authors: J. Pavlič, J. Genova, G. Popkirov, A. Iglíč, V. Kralj-Iglíč M. D. Mitov,)
  - has been included in Labome.Org,
  - has been enlisted in Global Medical Discovery Series.
- Best poster prize on the 17<sup>th</sup> International School of Condensed Matter Physics “Open Problems in Condensed Matter Physics, Biomedical Physics and their Application” Varna 2012 – for the study: “A study on the interaction of nanoparticles with lipid membranes and their influence on membrane fluidity”, with authors: P. B. Santhosh, S Penič, J Genova, A Iglíč , V Kralj-Iglíč and N P Ulrih

#### **Field of activities:**

Investigation of the mechanical properties (elasticity, permeability, morphology, etc.) of lipid mono- and bilayers, micropipette technique for micromanipulation of emulsion droplets and lipid vesicles, analysis of thermally induced shape fluctuations for elasticity measurements of quasispherical giant vesicles, influence of additives on the mechanical

properties of lipid mono- and bilayers, dynamics of fluctuating vesicle, etc.

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