

Conf. Dr. Valentin Barna

Scientific Results (review): Over 45 ISI articles published between 2004 – 2017 in prestigious international journals (NATURE Physics, Phys. Rev. Lett, Appl. Phys. Lett, Phys. Rev. E, Opt. Lett., Optics Express etc) having over 500 citations up to date (Hirsch Index = 13); 5 non-ISI articles; more than 100 contributions at prestigious national/international scientific conferences and meetings (oral presentations or posters), several invited Interviews in international scientific magazines/journals; 6 books or book chapters (coauthor) and 2 international patents (coauthor). Other pending publications/patents.

a) ISI Publications:

1. "A model of melt-solid phase transition in linear polymers", V.Barna, C.Miron, C.Berlic, E.S.Barna. Plastic Materials, 40, 4, p.168-172, (2003).
2. "Fast electro-optic switching in nematic liquid crystals". A.L.Ionescu, A.Ionescu, E.S.Barna, V. Barna, N. Scaramuzza. Applied Physics Letters Vol 84(1) pp. 40-42., (2004).
3. "Molecular simulation of the free surface order in NLC samples", N. Scaramuzza, C.Berlic, E.S.Barna, G.Strangi, V. Barna, A.Ionescu, Journal of Physical Chemistry B, 108(10), 3207-3210, (2004).
4. "Role of delocalized electrons in polyaniline - nematogen cyanobiphenyls interaction", A.L.Ionescu, A.Ionescu, E.S.Barna, V.Barna, N. Scaramuzza. Journal of Physical Chemistry B, 108(26), 8894-8899, (2004).
5. "Preliminary FTIR measurements of the anchoring properties of the Liquid Crystal (5CB) on Polyaniline substrate in Hybrid LC Cells using conventional infrared (IR) sources at DAΦNE-L Laboratory", V.Barna, et al Plastic Materials, 41, 1, p15-21, (2004).
6. "Color Tunable Distributed Feedback Organic Micro-Cavity Laser", G. Strangi, V. Barna, et al. Physical Review Letters 94, 063903, (2005).
7. "Band-Edge and Defect Modes Lasing Due to Confinement of Helixed Liquid Crystals in Cylindrical Microcavities", Barna V. et al. Published as article in Applied Physics Letters 87, 221108 (2005). Also as Journal Cover in Applied Physics Letters, Nov 2005 Issue.

8. "Distributed Feedback Micro-Laser Array: Helixed Liquid Crystals Embedded in Holographically Sculptured Polymeric Microcavities", Barna V., et al. *Optics Express*, Vol.14, 7, pp 2695-2705, (2006).
9. "Random Lasing and Weak Localization of Light in Dye-Doped Nematic Liquid Crystals", Strangi G., Ferjani S., Barna V., et al. *Optics Express*, 14, 17, 7737-7744 (2006).
10. "Thermal Behaviour of Random Lasing in Dye Doped Nematic Liquid Crystals", Ferjani S., Barna V. et al. *Applied Physics Letters* 89, 121109 (2006).
11. "Random lasing in dye doped nematic liquid crystals: the role of confinement geometry", Strangi G., Ferjani S., Barna V., De Luca A., Versace C., Scaramuzza N., Bartolino R. *Liquid Crystals and Applications in Optics*, Vol. 6587, 5870, (2007).
12. "Random Lasing in Freely Suspended Dye Doped Nematic Liquid Crystals" Ferjani S., Barna V., et al. *Optics Letters*, Vol. 33 Issue 6, pp.557-559 (2008).
13. "Statistical Analysis of Random Lasing Emission Properties in Nematic Liquid Crystals", Ferjani S., Sorriso L-V., De Luca A., Barna V., et al. *Physical Review E* 78, 011707 (2008).
14. "Nanoscale alignment and optical nanoimaging of a birefringent liquid", Barna V., De Luca A., Rosenblatt C. *Nanotechnology* 19, 32, 325709 (2008).
15. "Optical nanotomography of anisotropic fluids", De Luca A., Barna V., Atherton T., Carbone G., Sousa M., Rosenblatt C. *Nature Physics*, 4, 869 (2008).
16. "Photopolarimetric Investigations of the Anchoring Energy Strength for a Nematic Liquid Crystal on Polyaniline Boundary Surfaces", Barna V., Strangi G., Barna E.S. *Journal of Optoelectronics and Advanced Materials*, 10, 12, 3403 (2008).
17. "Thermo-Recurrent Nematic Random Laser", Ferjani S., De Luca A., Barna V., Versace C., Strangi G. *Optics Express*, Vol. 17, No. 3, 2042, (2009).
18. "Direct measurement of surface-induced orientational order parameter profile above the nematic - isotropic phase transition temperature", Lee J-H., Atherton T., Barna V., et al. *Physical Review Letters* 102, 167801 (2009).
19. "Coherent backscattering and dynamical light localization in liquid crystals driven throughout chaotic regimes", Carbone F., De Luca A., Barna V., Ferjani S., Versace C., Strangi G. *Optics Express* 17, 16, 13435 (2009).

20. "The influence of drying temperature on the closed-packed structure of silanized monolayers deposited on indium tin oxide (ITO) substrates", D'Elia S., Barna V., et al. *Journal of Materials Research*, 24, 9, 2784 (2009).
21. "Laser action in dye doped liquid crystals: from periodic structures to random media", A. de Luca, V. Barna, et al. *Journal of Nonlinear Optical Physics & Materials*, Vol. 18, No. 3, 349 (2009).
22. "Nematic Director Distribution of a Liquid Crystalline System Presenting a Cylindrical Defect", C. Berlic and V. Barna, *Journal of Optoelectronics and Advanced Materials*, 12, 1427 - 1432 (2010).
23. "Model for trap-assisted electron tunneling in thin insulators", V. Filip, J. Liu, C. K. Wong, H. Wong, D. Nicolaescu, V. Barna, and E. S. Barna, *Journal of Vacuum Science & Technology B*, 28, 2 (2010).
24. "Efficient random laser effect in a new dye-nematic liquid crystalline composite", V. Barna, et al, *Rom. Rep. Phys.*, 62, 3, 444 (2010).
25. "Monte Carlo simulation of the molecular distribution and optical properties of a nematic liquid crystal system with periodic surface gratings", C. Berlic and V. Barna. *Optics Express*, 18, 23, 23646 (2010).
27. "Amplification of light and random laser action in partially ordered dye-doped nematics" V. Barna, A. de Luca, S. Ferjani and G Strangi, *Optoelectronics and Advanced Materials – Rapid Communications*, 5,11,1154 (2011)
28. "High Yield Biopolymer Systems Obtained From Leather Wastes" A.G. Zainescu, V. Barna,R. Constantinescu,V. Petre, *Plastic Materials*, 48,4 (2011)
29. "Molecular simulation of a nematic liquid crystal cell with asymmetric recurrent boundary conditions" V. Barna and C. Berlic, *Molecular Crystals and Liquid Crystals*,549,140 (2011)
30. "Synchrotron infrared microspectroscopy of nematic liquid crystals in polymeric micro cavities" V. Barna and E.S. Barna, *Optoelectronics and Advanced Materials - Rapid Communications*, 5, 10,1046 (2011)
31. "Representative longitudinal optical phonon modes in polar semiconductor quantum dots" Cheche, T.O., Barna, V., Stamatina, I. , *Chemical Physics*, 400, 207 (2012)
32. "Monte Carlo Simulation Study For A Negative Dielectric Anisotropy Nematic Liquid Crystal Presenting A Defect Nanoparticle Under Applied Electric Field Conditions" Berlic, C;

Moiescu, M; Manolescu, B; Barna, V; Digest Journal Of Nanomaterials And Biostructures
Volume: 7 Issue: 4 Pages: 1701-1707; (2012)

33. "Fabrication And Characterization Of Thin Polyaniline Films Obtained By Glancing Angle
Deposition (Glad) Technique" Ion, FM ; Barna, V; Vulpe, S; Radu, A; Filimon, A; Gentiana, H
Digest Journal Of Nanomaterials And Biostructures, 7, 4, 1481-1490 (2012)

34. "The Effect Of The Electric Field On The Nematic Liquid Crystal Molecular Redistribution
In The Vecinity Of An Immersed Spherocylindrical Nanoparticle" ; Berlic, C; Moiescu, M;
Barna, V;

Digest Journal Of Nanomaterials And Biostructures, 7 ,4 , 1401-1412 (2012)

35. "Periodic and aperiodic liquid crystal-polymer composite structures realized via spatial light
modulator direct holography" Infusino, M; De Luca, A; Barna, V; Caputo, R; Umeton, C;
Optics Express, 20, 21 , 23138-23143 (2012)

36. "Theoretical approach for type-i semiconductor spherical core-shell quantum dots
heterostructure with wide band gaps" T. O. Cheche, V. Barna, I. Stamatini;
Journal Of Optoelectronics And Advanced Materials Vol. 15, No. 7-8 p. 615 - 620 (2013)

37. "Analytical approach for type-II semiconductor spherical core-shell quantum dots
heterostructures with wide band gaps" Tiberius O. Cheche , Valentin Barna , Yia-Chung Chang,
Superlattices and Microstructures, 60, 475-486 (2013)

38. "Monte carlo type investigations on the nucleation processes in soft matter systems"
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Biostructures 8 (4), pp. 1845-1852, (2013)

39. "Para-phenylene derivatives obtained by plasma polymerization technique" Nastase, C.,
Dumitru, A., Barna, V., Nastase, F.; Digest Journal of Nanomaterials and Biostructures 8 (4), pp.
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40. "Investigations on the nucleation processes in frustrated polymeric systems" Berlic, C.,
Barna, V., Manolescu, B., Mahler, B., Staicu, D.; Digest Journal of Nanomaterials and
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9 (3), pp. 919-928 (2014)

41. "Study of the instantaneous nucleation phenomena in soft matter systems by means of Monte
Carlo simulation" Berlic, C., Barna, V., Manolescu, B., Dena, D. ; Digest Journal of
Nanomaterials and Biostructures 9 (1), pp. 197-204 (2014)

42. "Investigation Of Polymer Nucleation Process In N-Dimensional Space", C. Berlic, V. Barna, B. Manolescu; Digest Journal of Nanomaterials and Biostructures 10, 4, 1365 (2015)
43. "Mirrorless dye doped ionic liquid lasers", V. Barna, L. De Cola, Optics Express 23, 9, 11936 (2015).
44. "Sporadic Polymer Crystallization In The N-Dimensional Space", C. Berlic, V. Barna, Digest Journal of Nanomaterials and Biostructures 11, 1, 159 (2016).
45. "FTIR Investigation Of The Ageing Process Of Carbon Nanowalls", V. MĂRĂSCU, S. VIZIREANU, S. D. STOICA, V. BARNA, A. LAZEA-STOYANOVA, G. DINESCU, Rom. Rep. Phys., 68,3, (2016).
46. "Application of image recognition algorithms for statistical description of nano- and microstructured surfaces" , V. Mărăscu, I. Chițescu, V. Barna, M. D. Ioniță, A. Lazea-Stoyanova, B. Mitu, G. Dinescu, AIP Proc, 1722, 290006 (2016).

b) Patents

1. "Transient interface charged layer effect (TICLE) on the relaxation of electro-optic switching in nematic liquid crystals to build electro-optical devices", A.Th. Ionescu, A.L. Alexe-Ionescu, N. Scaramuzza, E.S. Barna, V. Barna, Patent DF 03 A 0002376 , 2003.
2. "Random Lasing Photo-Curable Composition for Use as Random Lasing Gain Medium", L. De Cola, D. Genovese, V. Barna, Patent 16305467.9 -1556, 2016 (2nd phase pending).

c) Books/ book chapters

1. "Polymer Physics Breviary", Constantinescu L., Barna E.S., Fianu S. and Barna V. Editura Universitatii din Pitesti, 234 pag, (2005), Romania.
2. "Physical Properties of Polymers. Applications.", Constantinescu L., Berlic C. and Barna V. Editura Universitatii din Bucuresti, 196 pag, (2006), Romania.
3. "Mechanics and Acoustics. Experiments – part 1", Ciucu C, Barna V, Miron C. Editura Universitatii din Bucuresti, 110 pag, (2009), Romania.
4. "Mechanics and Acoustics. Experiments – part 2", Ciucu C, Barna V, Miron C, Berlic C, Barna ES, Editura Universitatii din Bucuresti, 80 pag, (2010), Romania.

5. Chapter – “Random Lasing in Liquid Crystals” in “Liquid Crystal Microlasers”.

Strangi G., Barna V., De Luca A., Ferjani S., Versace C., Ed. Transworld Research Network, ISBN 978-81-7895-469-1, (2010).

6. Chapter - “Syntheses and Applications of Carbon Nanotubes and Their Composites“ Chapter - “Mixtures Composed of Liquid Crystals and Nanoparticles” , V Popa-Nita, V. Barna, R. Repnik, S. Kralj, Ed. INTEC (Ed. S. Suzuki), ISBN 978-953-51-1125-2, (2012).

A handwritten signature in blue ink, appearing to be 'V. Barna', with a long horizontal line extending to the right.