Vladimir Škarka

Full research professor of Institute of Physics in Belgrade

Full professor at University of Angers, France

Distinguish professor of University of Angers

Member of Serbian Academy of Nonlinear Sciences

Born on March 3, 1948 in Belgrade

14. Gymnasium of Belgrade
School of Electrical Engineering,
University of Belgrade:

Relation between Liouville and Boltzmann equations

Université Libre de Bruxelles (I. Prigogine):

Contribution to the statistical mechanics of irreversible processes in inhomogeneous gases through the subdynamics approach

Scientific Results

Statistical mechanics of irreversible processes in inhomogeneous gases through the subdynamics approach (Skarka, Bulletin de la classe des sciences Academie Royale de Belgique 1974, 1978a,b; 1983; Physica A 1984a,b, 1985, 1987a,b, 1989a,b, Journal of Phys. A: Math and General 1988, 1990a,b).

Mathematical model of building behavior of « Apis mellifera » (Skarka et al. J. Theoret. Biology, 1990, J. Math. Biology, 1993).

Propagation of relativistic electrn positro solitary waves across pulsar magnetic field (Skarka et al. Phys. Plasmas 1994, Physica Scripta, 1998, PRB 1994, PRE 1993, 1997); (V. Berezhiani, V. Skarka, S. Mahajan, PRE 1993, 1998, PRB 1998).

Evolution of singular optical pulses towards vortex solitons and filamentation in air (Skarka et al. PRB 2010, PRE 2001, Phys. Lett. A 2001, 2003).

Spatiotemporal soliton propagation in saturating nonlinear optical media (Skarka et al. PRE 1997, 1999a,b, 2001, Phys. Lett. A 2001, PRB 2010); (Berezhiani, Skarka et al. PRA 2001).

Stability of dissipative solitons as solutions of asymmetrical complex cubic-quintic Ginzburg-Landau equation (Skarka et al. PRL **96,** 013903 2006, JOA 2008, PRA 2010, Opt. Quant Elec. 2016); (Aleksic, Skarka et al. PRA 2007, 2010, 2015, Phys. Scr. 2012a,b, 2014).

Morphogenesis of two-dimensional dissipative vortex solitons via spontaneous symmetry breaking (Skarka et al. PRL **105**, 213901, 2010, PRA 2014).

Self-structuring of stable dissipative breathing vortex solitons in a colloidal nanosuspension (Skarka et al. Optics Express **25,** 10090, 2017).

Experimental realization of robust two-dimensional spatial solitons - in liquid carbon disulfide (CS_2). PRL **110**, 013901 (2013).

- in bismuth germanium oxide single crystals ($Bi_{12}GeO_{20}$)
(Skarka et al., Optical and Quantum Electronics **50**, 37, 2018).

I-scan measurements of the third order nonlinear properties of conjugated polymers embedded in porous silicon and silica
(Skarka et al. Phys. stat. sol. (a) 2003); (Simos et al. Phys. stat. sol. (c) 2005a,b,c).

The principal author of about 70 papers in international research journal, including 50 leading ones. About 40 keynote or invited talks on international conferences.

List of 5 Selected Research Publications

1. V. Skarka, N.B. Aleksic
Stability criterion for dissipative soliton solutions of the one-, two- and three-dimensional complex cubic-quintic Ginzburg-Landau equation, Physical Review Letters **96** (2006) 013903.
2. V. Skarka, N. B. Aleksic, H. Leblond, B. A. Malomed, and D. Mihalache
Varieties of stable vortical solitons in Ginzburg-Landau media with radially inhomogeneous losses, Physical Review Letters **105** (2010) 213901.
3. E.L. Falcao-Filho, C. B. de Araujo, G. Boudebs, H. Leblond, and V. Skarka,
Robust two-dimensional spatial solitons in liquid carbon disulfide,
Physical Review Letters **110** (2013) 013901.
4. V. Skarka, V. I. Berezhiani, and R. Miklaszewski
Spatiotemporal soliton propagation in saturating nonlinear optical media
Physical Review E **56** (1997) 1080.
5. V. Skarka, N. B. Aleksic, W. Krolikowski, D. N. Christodoulides, S. Rokotoarimalala, B. N. Aleksic, and M. Belic, ***Self-structuring of stable dissipative vortex solitons in a colloidal nanosuspension,*** Optics express **25** (2017) 10090.

Reviewer of Physical Review Letters, Physical Review A, Physical Review E, Optics Letters, Optics Express, Annals of Physics, The European Physical Journal, Physica Scripta.

International collaborations:

Département de Physique Statistique, Plasmas et Optique Non Linéaire, Faculté de Sciences, Université Libre de Bruxelles, Belgium.
CREOL, University of Central Florida, Orlando, USA.
Institute of Fusion Studies, University of Texas at Austin, USA.
University of Oxford, Oxford, UK.
University of North Wales, Bangor, UK.
Photonic Research Group, School of Engineering and Applied Science, Aston University, Birmingham B4 7ET, UK.
Laser Physics Center, Australian National University, Canberra, Australia.
Tel Aviv University, Tel Aviv 69978, Israel.
University of Natal, Natal, Brazil.
Institute of Plasmas Physics, University of Buenos Aires, Argentina.
Institute of Physics, Tbilissi, Georgia.
Horia Hulubei National Institute for Physics and Nuclear Engineering, Bucharest, Romania.
University of Texas A&M, Qatar:

NPRP 2016-2020 No.: 9-020-1-00: « Self-generated spatiotemporal nanostructuring of laser light applied to energy transport and reconfigurable guiding networks in nanophotonics, plasmonics, and hybrid nanoparticles metacolloids».

NPRP 2013-2017 No.: 5-195-1-048: "Self-organized solitary waves propagating in polymers, metamaterials, photonic crystals, nanocomposites, nanoplasmonics, and semiconductor quantum wells, for applications in information technology".

Educational activities

As full professor he teach in autumn semester (September – December) at University of Angers: Statistical physics I и II; Physics of semiconductors; Thermodynamics; Waves and oscillations; Nonlinear hybrid optical materials.

Supervisor of postdocs

Christos Simos: I-scan measurements of the third order nonlinear properties of conjugated polymers embedded in porous silicon and silica.
Marina Lekic: Les guides reconfigurables par l'auto-organisation des solitons dissipatifs dans des nouveaux matériaux nanocomposites.

Supervisor of doctoral dissertations

Makboula Derbazi: Les structures solitoniques dissipatives multidimensionnelles dans des matériaux hybrides.
David Gauthier: Contribution à l'étude de la propagation des solitons spatio-temporels dissipatifs dans des nouveaux matériaux composites non linéaires en vue d'applications dans les télécommunications.
Marzouk Kloul: Contribution à la mise au point de méthodes de contrôle et de caractérisation de guides d'ondes composites silicium poreux et silice poreuse/ molécules organiques. Université du Maine.
Vincent Boucher: Solutions spatiaux : Contribution à l'étude de propagation non linéaire. Université d'Angers.