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Curriculum Vitae

Professor Tiberiu TUDOR
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Date of Birth: 29. 07. 1941

Education:
Faculty of Mathematics and Physics of the University of Bucharest
PhD in Physics

Position and responsabilities:
Professor – from 1991
Associate Professor – 1991
Lecturer – 1990
Assistant Professor – up to 1989

Head of Department of Optics-Spectroscopy-Plasma-Lasers, Faculty of Physics, University of Bucharest (2000-2011).
Director of the Center of Development and Research Photonics-Spectroscopy-Plasma-Lasers, Faculty of Physics, University of Bucharest (2006 – 2011).
Visiting Professor at the University of Hamburg (1994) and University of Münster (1991).
Research stages at the Joint Institute for Nuclear Researches – Dubna (1983-1993).

Didactic activity:
Optics (year II), Coherent Optics (year IV)
Optical processing and transmission of information (Master)
Photonics, Fourier Optics, Lasers (Doctoral studies)

Domains of competence:
Optics, Lasers, Coherent Optics, Quantum Optics,
Optical processing and transmission of information.
Normal and nonnormal operators in Physics.
Theory of Relativity.

Scientific activity:

Research areas

- Coherence of light. Intensity waves. Coherence of multifrequency optical fields.
- Light modulation, optical transmission of information. Modification of spectral and polarization structure of light by modulation. Polarization waves.
- Lasers, mode locking of lasers, theory of laser beams propagation in optical fibers and linear optical systems.
- Optical processing of information, holography and their applications in nuclear particles detection.
- Dirac and Pauli algebraic formalisms in polarization optics.
- The nonorthogonal polarization devices (non-normal operators) in the theory of generalized quantum measurement.
- Quasi-relativistic approach in light polarization theory

Main original scientific contributions (results)

– In the **field of the pure operatorial** (“non-matrix”, “coordinate-free”) **theory of polarization devices and of the analysis of the polarization devices in terms of quantum physics**:

- Operatorial analysis of the orthogonal and non-orthogonal polarization devices in dyadic language (J. Opt. Soc. Amer. A, **23**, 2006; J. Opt. Soc. Amer. A, **20**, 2003; Appl. Opt. **51**, 2012) and in the frame of Pauli algebra (J. Phys. A: Math. Theor., **41**, 2008; J. Opt. Soc. Amer. A, **24**, 2007)
- Establishing of the generalized Malus’ law (Appl. Opt., **51**, 2012, J. Mod. Opt.; **58**, 2011) and of the equation of the degree of polarization ellipsoid (DOP) (J. Opt. Soc. Amer. B, **28**, 2011)
- Illustration of the theory of generalized quantum measurement by the operators of the non-Hermitian polarization devices (J. Phys. A: Math. Gen., **36**, 2003; Appl. Opt. **53**, 2014)
- The analysis of the singularities of some composed polarization devices (Opt. Lett., **36**, 2011)
- Nonnormal operators in physics. Polar (Opt. Lett. **39**, 2014) and singular vectors (Appl. Opt. **55**, 2016) approaches

- In the **field of theory of relativity and quasi-relativistic approach in light polarization theory:**

- A new approach to Lorentz transformation in polarization optics (Journ. Opt. Soc. Amer. B, **34**, 2017; Journ. Opt. Soc. Amer. B **32**, 2015, Journ. Opt. 20, 2018, Opt. Lett., 43, 2018), in special relativity, and, generally, in physics (Symmetry **10**, 2018, Journ. Opt. 20, 2018; Opt. Lett. 43, 2018), based on the Poincaré sphere geometric tool
- Introduction of a generalized Lorentz transformation in polarization optics (J.Opt. Soc. Amer. B, **33**, 2016)
- Establishing of the analog of the relativistic gyrovectors' composition law in light polarization field (Opt. Lett. **40**, 2015)

– In the **field of light modulation, dynamic polarization, optical heterodynig and optical transmission of information:**

- Elaboration of the theory of intensity waves (J. Opt.-Paris, **22**, 1991; Optik-Int. Journ. Light Electr.Opt., 100, 1995), of polarization waves (J. Opt. Soc. Amer. A, **14**, 1997), and the experimental revealing of these waves (Appl. Opt., **38**, 1999)
- Theoretical and experimental analysis of the modification of the spectral and polarization structure of light by modulation (J. Opt.-Paris, **14**, 1983)
- Spectral analysis of the operators of dynamical polarization devices (J. Opt. Soc. Amer. A, **18**, 2001; J. Mod. Opt., **48**, 2001; Pure Appl. Opt.,**7**, 1998), with application to the optical modulators (Appl. Opt., **47**, 2008) and generalization to the dynamics of any “two-state systems” (J. Phys. Soc. Japan, **81**, 2012; J. Phys. A: Math. Theor., **40**, 2007)

– In the **field of light coherence**:

- Deduction of the equation of propagation of the generalized mutual coherence function and of the relativistic relationship between the generalized mutual coherence function and Wolf’s coherence function (J. Opt.-Paris, **12**, 1981)
- Theoretical and experimental analysis of the generalized coherence of multi-frequency optical fields (J. Phys. Soc. Japan, **73**, 2004; J. Opt.-Paris, **25**,1994)

– In the **field of applications of optical processing of information in nuclear particle detection**:

- Participation to the design and build up of various laser-illuminated streamer chambers, with dark-field or holographic detection, and of the corresponding lasers, at J.I.N.R. – Dubna (Nucl. Instr. Meth. A, **236**, 1986)

Awards and membership:	Member of the Romanian Academy of Scientists Member of the Romanian Physical Society Member of the European Optical Society Member of the International Society for Optical Engineering Award "Constantin Miculescu" of the Romanian Academy, 1983

Last update: September 05, 2012