DUŠAN J. POPOV

Born on July 28, 1948, in Naćvala, Arad County, western Romania. He finished primary school (in Serbian) in his native village, and secondary and high school education (in Romanian) in Arad, at the "Joan Slavici" Gymnasium. He attended the Faculty of Physics at the University of Timisoara (1966/71) and graduated in 1971. He defended his doctoral dissertation *Description of multi electronic systems using the density matrix approach* on January 20, 1987, at the University of Craiova (PhD supervisor - Prof. Dr. Oliviu Gherman). After graduating from the faculty, he was the editor for Serbian textbooks at the Didactic and Pedagogical Publishing House in Bucharest (1971/77), working on editing and translating, from Romanian to Serbian, textbooks for Serbian schools in Romania. In 1977, through a competition, he moved to the Department of Physics at the University Politehnica Timisoara, where he was successively assistant, assistant professor and associate professor, and since 2006 a full professor. At the Department of Physics, he served as the scientific secretary of the department (1987/2005), a member of the department's Board of Directors (1990/2005), and for some time he was the head of the department (2005/07), until the reorganization of departments at the university, in accordance with the requirements of the European Community. From 1990 until today, he was a member of the Editorial Board and main editor (for physics) of the journal *Scientific Bulletin of the Polytechnic University of Timisoara, Romania, Transactions on Mathematics & Physics*, ISSN 1224–606 http://www.upt.ro /Informatii_seria-matematica_294_ro.html He has been retired since 2013. Dr. Dušan J. Popov was a member of the Romanian Society of Physics (SRF), the European Physical Society (EPS) and the General Association of Engineers of Romania (AGIR), and also a member of the Editorial board of the "NPB Journal of Criminalistics and Law Belgrade" from Belgrade.

Occasionally, by invitation, he was the referee for several international journals of physics: Physics Letters A, Journal of Physics and Chemistry of Solids, Applied Mathematical Letters, Electronic Journal of Theoretical Physics, Physica A, Chinese Physics B, Frontiers of Physics, International Journal of Theoretical Physics, Journal of Mathematical Physics and others. For his didactic activity, he was awarded by the Ministry of Education of Romania with the diploma "Honored Assistant Professor" (1987) and the diploma "Distinguished Teacher", by the organization of students of the Faculty of Electronics and Telecommunications (2004). Professor Dr. Dušan J. Popov was elected as a full member of JANN at the JANN Assembly on November 30, 2011, and is now a member of the Serbian Academy of Nonlinear Sciences (SANN) in the category of foreign members.

Scientific research topics. The main direction of scientific interests of Dr. Dušan J. Popov was quantum mechanics, specifically nonlinear and noncanonical models. He focused on the application of the density matrix in the study of quantum - statistical properties of nonlinear oscillatory systems, especially, pseudoharmonic (PHO) and Morse (MO) oscillators. In this regard, he intensively used the formalism of coherent states, which he also applied in several papers in the field of quantum information and nano-systems.

Scientific results. Professor Dr. Dušan J. Popov has published 54 professional papers, recorded in international databases (Scopus, Web of Science, MathSciNet, Academica, ORCID). He published 41 papers in domestic journals of lower classification (in Romania), and participated with 26 papers in international and 33 in domestic (in Romania) conferences. He has written 2 chapters in foreign books: *Quantum Frontiers of Atoms and Molecules* (Nova Science Publishers, Inc. New York, 2011) and *Advances in Quantum Chemical Bonding Structures* (Transworld Research Network, Kerala, India, 2008), and co-authored the book: Bratislav Tošić, Vjekoslav Sajfert, Dušan Popov, Jovan Šetrajčić, D. Ćirić, *Application of differential calculus in the analysis of nanostructures*, Vojvodina Academy of Sciences and Arts, Novi Sad, 2005. In Romania, Dr. Dušan J. Popov published published the following books: Dušan Popov, V. Putz, I. Zaharie, *Informația cuantică în sisteme multiparticulă*, Editura Politehnica, Timișoara, 2008 (book awarded a diploma by the General Association of Engineers of Romania - AGIR), Bratislav Tošić, Vjekoslav Sajfert, Dušan Popov, Jovan Šetrajčić, D. Ćirić, *Analiza teoretică a proprietăților specifice ale nano - structurilor*, Editura Politehnica, Timișoara, 2007 and Dušan Popov, *Matricea densității - proprietăţi generale şi aplicaţii în fizica sistemelor cu multe particule*, Editura Politehnica, Timișoara, 2004.

Response to scientific results. Until today (May 2020), the page dedicated to Dr. Dušan J. Popov of the scientific service Google Scholar states that he has 740 citations of his works, as well as h-index 15 and i10-index 21. These citations can be followed on the Google Scholar website https://scholar.google.com/citations?user=U7rv7TMAAAAJ&hl=ro&oi=ao He has presented his works, alone or as a co-author, at international conferences (extract): 10th Int. Scientific Conf. "Science and Higher Education in the Function of Sustainable Development" (Užice, 2017), 2nd Central and Eastern European Conference on Thermal Analysis and Calorimetry (Vilnius, 2013), 20th Central European Workshop on Quantum Optics (Stockholm, 2013), Six International Conference of the Balkan Physical Union (Istanbul, 2007), Sixth International Symposium Nikola Tesla (Belgrade, 2006), Fifth General Conference of the Balkan Physical Union BPU-5 (Vrnjacka Banja, 2003) and others.

Pedagogical and other engagements. In his position as associate and then full professor, he formed and held the subject Physics (lectures, seminars and laboratory exercises) at the Faculty of Electronics and Telecommunications of the University Politehnica Timisoara, both in the system of regular (traditional) teaching and in the system of "teaching at distance" (after Romania's accession to the European Union). Occasionally, if necessary, he taught at other faculties of the domicile university. For the needs of students he wrote several books of theory, problems and laboratory exercises: M. Cristea, Dušan Popov et al., *Fizică - Elemente fundamentale*, Editura Politehnica, Timișoara, 2006, I. Damian, Dušan Popov, *Fizică - teme experimentale*, Editura Politehnica , Timișoara, 2003, Dušan Popov, I. Damian, *Elemente de fizică generală*, Editura Politehnica, Timișoara, 2001, Dušan Popov, I. Damian, *Fizică - Curs pentru învățământ la distanță*, Editura Politehnica, Timișoara, 2000 and others.

In addition to direct work in teaching, Dr. Dušan J. Popov was active within the Serbian community in Romania. After 1990, he has continuously been elected in the management structures of the Association of Serbs in Romania (SSR): member of the Board of Directors, president of the School Commission, president of the SSR - Timisoara branch, president of the SSR. In the mandate 2008-2012 he was a deputy of the Serb minority in the Chamber of Deputies of the Romanian Parliament. For many years, he was a member of the Timisoara Diocesan Council of the Serbian Orthodox Church and the president of the Church council of the Serbian Cathedral Church in Timisoara - the City. For more than a quarter of a century, he has been a member of the Mixed Church Choir at the Serbian Cathedral in Timisoara - the City.

As a student, in 1969, he founded (together with a couple of friends) the Youth Orchestra of Serbian students from Timisoara, which would later turn into the Academic Cultural and Artistic Association "Mladost" and operate continuously and successfully until

today. Dr. D. J. Popov studies the past of Serbian ethnic minority in the regions around the Mures River and Romanian Banat. He has published several papers in professional periodicals and collective collections in the country and abroad, as well as several articles on the historical contribution of Serbs to the development of science and culture (Atanasije Stojković, Mihailo Pupin, Nikola Tesla). He published in some journals and periodicals: *Arad kroz vreme*, *Banatske novine*, *Bezdinski vesnik*, *Temišvarski zbornik*, *Književni život*, *Naša reč*, *Pravda*, *Temišvarski vesnik*. Dr. Dušan J. Popov also collaborated in the Serbian language section of the Radio Timisoara.

Dr. Dušan J. Popov was elected a member of the Timisoara Board of Matica Srpska in Novi Sad in the mandate from 2020 to 2024, as well as a member of the Editorial Board of the periodical *Temišvarski zbornik*. During the year, Dr. Dušan J. Popov received: The "Vidovdan Charter" of the Alliance of Serbs in Romania (together with his family), for his overall activity and engagement in the field of Serbian spirituality in Timisoara and Romania (2001); An "Acknowledgment" from the Consulate General of the FR of Yugoslavia in Timisoara, for his contribution to the development of Yugoslav-Romanian relations and comprehensive cooperation and ties with the motherland (2002); For his work, as a deputy in Romanian Parliament, for the renovation of Serbian monasteries in Banat, Romania, the Serbian Orthodox Diocese of Timisoara awarded him a "Letter of Thanks" on Vidovdan, June 28, 2014.

Organizational work. In addition to the above-mentioned functions in teaching (scientific secretary, head of the department), respectively those within the Alliance of Serbs in Romania and as member of the Romanian Parliament, which implicitly imply an intense organizational work, Dr. Dušan J. Popov actively participated in the preparation of several scientific conferences and round tables related to the development and improvement of physics teaching at the university and high school level. For several years, he was a guide for the work of physics teachers at high schools in Timisoara and Arad. He has realized several projects for equipping the research and didactic laboratories of the Department of Physics.

Contribution to nonlinear sciences. Practically, his entire scientific opus, Dr. Dušan J. Popov focused on the study of nonlinear models in physics, and especially in quantum mechanics. It is known that the harmonic oscillator is only an ideal model, which gives consistent results with experiments only near equilibrium, and its energy spectrum is linear. All other models of quantum potentials contain nonlinear functions and have nonlinear energy spectra, so they assume a different mathematical approach. In this regard, Dr. Dusan J. Popov developed in his works, a method for calculating the partition function for nonlinear oscillators, and introduced a new approach to the domain of coherent state formalism - the diagonal operators ordering technique (DOOT), which can be applied to all types of coherent states, linear and nonlinear.

List of 5 selected papers.

1. Dušan Popov, *Barut-Girardello coherent states of the pseudoharmonic oscillator*, Journal of Physics A: Mathematical and General, **34**, 5283 – 5296 (2001). DOI: 10.1088/0305-4470/34/25/310

2. Dušan Popov, *Photon-added Barut-Girardello coherent states of the pseudoharmonic oscillator*, Journal of Physics A: Mathematical and General, **35**, 7205 (2002). https://doi.org/10.1088/0305-4470/35/33/315

3. Shi-Hai Dong, Guo Hua Sun, Dušan Popov, *Group theory approach to the Dirac equation with a Coulomb plus scalar potential in D+1 dimensions*, Journal of Mathematical Physics, 44, 10, 4467 / 4479 (2003). DOI: 10.1063/1.1604185

4. Dušan Popov, Shi-Hai Dong, Miodrag Popov, *Diagonal ordering operation technique applied to Morse oscillator*, Annals of Physics (N Y) 362, 449 – 472 (2015) https://doi.org/10.1016/j.aop.2015.08.011

5. Bratislav S. Tošić, Dušan Popov, *Method for solving Bloch equation for Morse potential*, Journal of Physics and Chemistry of Solids, **61**, 10, 1561 – 1566 (2000). DOI: 10.1016/S0022-3697(00)00039-1.

Link for extended scientific activity: https://orcid.org/0000-0003-3631-3247