Antonio José Roque da Silva

Biographical information

Professor Antônio José Roque da Silva completed his bachelor's degree (1983-1986) and master's degree (1986-1989) in Physics at the Gleb Wataghin Institute of Physics (IFGW) at UNICAMP, Brazil. During his master's degree, he has worked on theoretical studies of spatial pattern formation and electron scattering by molecules. Between 1989 and 1994, he pursued his PhD at the Department of Physics, University of California at Berkeley under the supervision of Prof. Leopoldo Falicov. The title of his thesis was Magnetic and Optical Properties of Transition-Metal Halides and Solid Oxygen, and one of the notable results was the explanation of the contribution of magnetic entropy to the transition between the antiferromagnetic phase α-oxygen and the phase β-oxygen. Subsequently, he has worked at the Department of Chemistry and Biochemistry at the University of California, Los Angeles (UCLA), USA, in Prof. Emily Carter's group, focusing on quantum chemistry. His work focused on computational simulation using ab initio molecular dynamics methods. Notably, he studied the desorption of H_2 molecules from the (100) surface of Si, which was one of the first works using first-principles molecular dynamics to study reaction dynamics on surfaces. He also participated in the first work that aimed to integrate quantum chemistry and Density Functional Theory methods to treat correlated regions of an extended system via embedding techniques. In 1997, he joined the Institute of Physics at the University of São Paulo (USP), Brazil, as an assistant professor, initiating several projects in electronic structure calculations and computational simulations in various materials, with particular emphasis on nanostructures. It is worth mentioning his work on metallic nanowires, as well as on many other problems, such as carbon nanotubes, oxides, defects in semiconductors, surfaces, semiconductor nanowires, molecular electronics, and 2D materials, all with results regularly published in high-impact journals and conducted in collaboration with a variety of research groups in Brazil. He has also worked on the charge transport problem in nanostructures, participating in the development of the first Brazilian code for an ab initio calculation of these properties, TRANSAMPA. An important work in this area is the development of a method to treat via ab initio techniques the problem of charge transport in large and disordered systems (tens of thousands of atoms), allowing a realistic treatment of nano-sensors (Phys. Rev. Lett. 100, 176803 (2008)). He became associate professor (Livre Docente) in 2003, and Full Professor in 2008. He has published more than 130 articles in international journals, has participated in over 100 examination boards and committees (evaluations, competitions, doctoral and master's degrees), delivered more than 200 invited talks at conferences, workshops, and universities (both national and international), and has served on several organizing committees for national and international conferences, advisory committees, and the Brazilian Physics Olympiad. He has presented more than 230 papers at national and international conferences and is a level 1A Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) researcher. He has

supervised 22 master's, doctoral, and postdoctoral students. From 2008 to 2018, he served as one of the Physics Area coordinators at FAPESP, as a member of the Technical Scientific Council (CTC) of many scientific institutions in Brazil (LNA, INPE, and CBPF), and as a Member of the International Scientific Committee of the Kurchatov Institute (Russia). He has participated in Search Committees for Director´s positions of many institutions, such as CBPF (twice, once as chair), INPE, CTI (as chair), and ON, and was a member of the Advisory Scientific Committee of the Brazilian Nanotechnology Program (MCTIC, 2011-2017). Since 2021, he has been a Member of the Superior Council of the National Association of Research and Development of Innovative Companies (ANPEI). He has received the 100 MOST INFLUENTIAL IN ENERGY award in 2018 and 2019, in the Research, Innovation, and Technology category, by Grupo Mídia, and the 100 MOST INFLUENTIAL IN ENERGY OF THE DECADE award, 2020, by Grupo Mídia as well. He is a full member of the Brazilian Academy of Sciences (ABC) and the São Paulo State Academy of Sciences (ACIESP) and was honored in 2018 with the National Order of Scientific Merit - Comendador Class. From 2009 until 2018, he has worked as Director of the Brazilian Synchrotron Light Laboratory (LNLS), one of the units of the Brazilian Center for Research in Energy and Materials-CNPEM. In 2018 Prof. Antônio José Roque da Silva became Director General of CNPEM. During this period, he has led the project for the construction of the new Brazilian 4th generation synchrotron light source, Sirius. This is the largest scientific equipment ever built in Brazil, a state-of-the-art synchrotron, designed to have the highest brightness in its energy class. Besides Sirius, he has also been leading the project and construction of another important and unique project in Brazil and Latin America, the so-called Orion. This will be a complex of high and maximum containment laboratories to study a variety of pathogens, including those classified and BSL-4. It will be the first of this category in Latin America, and the very first in the world connect to a synchrotron source, Sirius. Besides Sirius and Orion, Prof. Roque da Silva coordinates, together with all the Directors of the units of CNPEM, a variety of activities in the fields of nanotechnology, biosciences, biorenewables, and scientific instrumentation and engineering.

Articles

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