Spring 2025 Colloquium

Physics and Astronomy, East Texas A&M University

Thursday, March 6, 2025

4:00 pm to 5:00 pm, McFarland Science Building 127

(coffee and cookies will be served at 3:50 pm)

Optics making difference in life science: Photodynamic action to break down the resistance of bacteria to antibiotics and for cancer treatment

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Abstract

The problem of antibiotic-resistant bacteria in general is one of the most serious faced by health programs. The difficulty in launching new generations of antibiotics has taken the problem to the extreme and several possible solutions, such as combinations of antibiotics, have not had the necessary effect. In this presentation, we will explain the basis of photodynamic and demonstrate how sub-dose photodynamic action can break the resistance of bacteria, making them susceptible again to traditional antibiotics. Many other microbiological control with optical techniques shall be presented. The application of techniques in the treatment of pharyngotonsillitis in the case of antibiotic-resistant pneumonia should be presented. Several ongoing clinical applications for cancer and other diseases will be covered. New experiments being carried out will be discussed and presented as possible solutions for many challenge health problems.

Vanderlei S. Bagnato, is a Physicist from USP (1981) and Materials Engineer from UFSCar (1981), with a PhD from MIT (1987). He is currently a professor at IFSC-USP (in absence) and a Full professor at Texas A&M University. He works in the fields of optics, atomic and molecular physics with cold atoms and bio photonics. He has published more than 750 scientific papers and advised more than 130 graduate students. He received several national and international awards. He is a member of the Brazilian Academy of Sciences, TWAS, the US National Academy of Science and the Vatican's Pontifical Academy of Sciences. He has several international collaborations. He coordinates several Brazilian, American and international projects. He has strong dedication to the diffusion of science and innovation besides the advances of basic science.