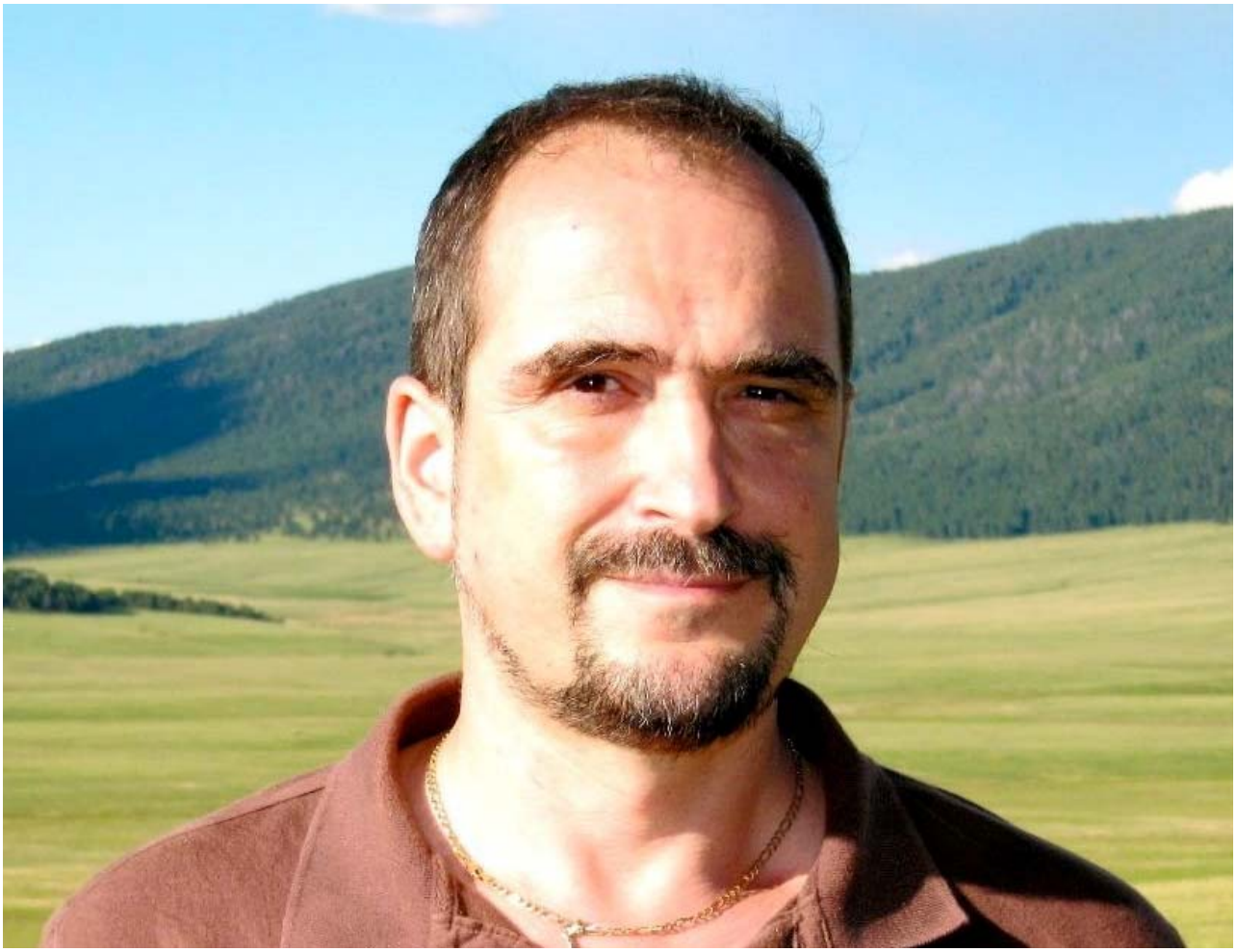

Daniel Vrinceanu

M.S. Physics – University of Bucharest, Romania, 1992

Ph.D. Physics – Georgia Institute of Technology, 2000

Selected Papers

"Angular Momentum Changing Transitions in Proton-Rydberg Hydrogen Atom Collisions," Vrinceanu, et al., Astrophysical Journal, **746,** 82 (2012).

"Surface Plasmon Resonances of Clustered Nanoparticles", Vrinceanu, et. al., Plasmonics, **6** 407 (2011).

"Strongly magnetized antihydrogen and its field ionization", Vrinceanu, et. al., Physical Review Letters, **92**, 133402 (2004).

ATOMIC PHYSICS

Dr. Vrinceanu's research interests are in Atomic, Molecular and Optical (AMO) physics. During the last decade atomic physics has been revolutionized in more than one way. The availability of simple, effective methods for laser cooling and trapping of atoms in their ground state, has made possible the realization of Bose-Einstein Condensation in a variety of atomic and molecular systems. Another breakthrough has been realized by the use of high intensity lasers to generate very short and very intense light pulses, based on a phenomenon called high harmonic generation. Also atoms made entirely of antimatter have been created and analyzed for the first time. The anti-hydrogen experiments at CERN combine positrons and antiprotons in a strong magnetic field trap. All these achievements probe matter at extreme conditions. Furthermore, they all contain basic and extremely interesting AMO physics.

Dr. Vrinceanu was born and raised in Romania. As a student at the "Mihai Viteazul" High School in Ploiesti, he was awarded the bronze medal at the **International Physics Olympiad** held in London. This scientific competition is the equivalent of the Olympic Games for sports and considers the very best students that represent their own countries. Immediately after obtaining his University degree in Mathematical Physics, he was offered the position of Assistant Professor in the Department of Theoretical Physics at the Bucharest University.

He obtained his doctoral degree in Theoretical Atomic Physics from Georgia Institute of Technology in Atlanta. The problem treated in his PhD Thesis made a significant theoretical contribution providing an elegant and e□cient solution to an outstanding problem incapable of being solved for more than 40 years. In recognition, he was awarded the Sigma-Xi award of **Best Ph.D Thesis 2001** and he was selected for **Thesis Prize** of the American Physical Society of Division of Atomic, Molecular and Optical Physics (DAMOP).

At the Institute for Theoretical Atomic and Molecular Physics at the Harvard-Smithsonian Center for Astrophysics Dr. Vrinceanu was the leader in a theoretical investigation of strongly magnetized antihydrogen atoms, aimed to clarify understanding and interpretation of the recent experiments at the European Center for Nuclear Reseach (CERN) by Harvard scientists. Their results on formation and electric field ionization of highly excited **anti-hydrogen atoms** are ground breaking and completely changed the way the experimental data is analyzed. For the upmost importance of the research, their work published in Physical Review Letter was featured on the journal cover.

Dr. Vrinceanu was granted the prestigious Director Fellowship at Los Alamos National Laboratory where he worked on large scale Monte Carlo and Molecular Dynamics Simulations of cold magnetized and un-magnetized plasmas.

At Texas Southern University (TSU) he has initiated and developed the Quantum Physics and Computational Physics courses. He is co-director of the TSU High Performance Computing Center, supervising the operation of a 1 TFlop super-computer. He collaborates with Dr. Bessis and Dr. Perroti on projects involving Advanced Signal Processing methods in detection of Gravitational waves and Diagnosis and Prognosis of mechanical systems.