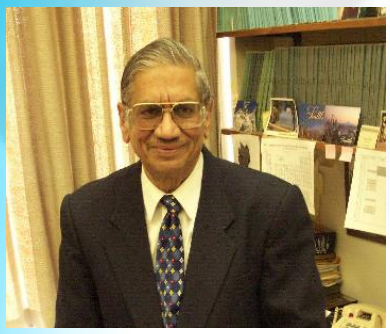
Physics Colloquium

Michigan Technological University

Thursday, September 5, 2013
at 4:00 pm
Room 139 Fisher Hall



Hyperfine Interaction as a Probe of Electron Distributions in Atoms, Molecules, Condensed Matter and Biological Systems

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Abstract: Hyperfine interactions, including Nuclear Quadrupole Interactions, provide valuable tools to study the nature of electron distributions in atoms, molecules, condensed matter and biological systems. In this talk, I will present the pros and cons of the variational approach (Hartree-Fock and Density Functional Theory) in predicting hyperfine properties in atomic systems by comparing theoretical results with the experimental data. I will also compare the hyperfine data obtained from the variational approach with the exact results from many-body perturbation theory (LCMBPT) to discuss the contributions from various many-body effects.

Biography: Prof. Tara Prasad Das has been in the physics department at University at Albany, State University of New York, since 1971. He received his Ph.D. in 1955 from Saha Institute of Nuclear Physics, India. He did his postdoctoral work at Cornell and UC, Berkeley. Then he spent his time as a faculty member at Saha Institute of Nuclear Physics, University of Illinois, Columbia University, University of California, Riverside and University of Utah before finally settling at University at Albany, (SUNY). He has graduated 53 Ph.D. students and has received numerous awards for his outstanding contributions to the field of electronic structure and hyperfine study in atomic, molecular, and solid state systems for more than five decades. Some of these recognitions are: APS Fellow in 1968, Jawaharlal Nehru Visiting Chair from the University of Hyderabad, India, Presidential Excellence Research Award from the University at Albany, Senior Visiting Scientist Award from Japan (Ministry of Education, Research and Sports), Eminent Scientist Award from RIKEN, Japan, Yamada Foundation Award from Japan, US Senior Scientist award from von Humboldt foundation, Germany, NQI Award from the International Society of Nuclear Quadrupole Resonance Spectroscopy. He has more than 400 publications and has written three books: Nuclear Quadrupole Resonance Spectroscopy (1957), Nuclear Induction (1957), and Relativistic Quantum Mechanics of Electrons (1973).

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