

Colloquium

Quantum Mechanics and Spectroscopy of Molecular Endofullerenes

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Molecular endofullerenes consist of symmetrical carbon cages, with each cage containing a single small molecule. These systems have been made by organic synthesis. To date endofullerenes containing H_2 , H_2O , HF and CH_4 are known. Investigations by low-temperature NMR, infrared spectroscopy, THz spectroscopy and neutron scattering show that the spatial degrees of freedom of the endohedral molecules are quantized, with energy level structure appropriate to a "rotor in a box". The spatial quantization is entangled with the spin quantization through the Pauli principle. Unusual physical phenomena are displayed such as spin-isomerism and quantum-rotor-induced polarization. I will review the quantum mechanics and spectroscopy of molecular endofullerenes, with emphasis given to the connections to magnetic resonance.

Friday, Dec 28th 2018

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H