Physical Chemistry Seminar

Tuesday, February 9, 2010 | **11:00 a.m.** | **Room 1315 Chemistry Building**

Are the Properties of Liquid Water Anomalous Even When Confined at the Nanoscale?

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Water is the most abundant molecule on Earth's surface. Due to specific anomalies, it is also the most studied. A well-known peculiarity in the temperature dependence of the density of liquid water is the existence of a maximum at atmospheric pressure slightly below room temperature. Yet, its consequences on the thermodynamic and dynamical properties in the supercooled liquid state, as T is further decreased, remain a subject of debate, mainly because, apart from numerical simulations, no experiments can be carried out below 240 K in the bulk liquid state. To postpone or avoid the inconvenient crystallization process, reduced geometries have often been applied and water under nanoscopic confinement has been studied in many respects. But confining a liquid introduces new length scales and phenomena that modify its thermodynamics and dynamics. Is confined liquid water -or any other fluid- an extension of the "bulk" liquid or is its specific behavior controlled by finite size and/or surface effects? This question is particularly important as water in most biological and geological systems is confined. I will present here new experimental results on the thermodynamic, structural, and vibrational properties of water confined within nanometric pores (size of a few molecular diameters) synthesised and characterized in our laboratory.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:15 p.m. in Room 8305f