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Melting and Freezing of Decanol inside Nanoporous Silica
SAMUEL AMANUEL, Dept. of Physics and Astronomy, Union College — It has been demonstrated for decades now that physical restriction leads to the reduction in melting and freezing temperatures. These can be explained, at least qualitatively, through the Gibbs-Thompson equation where the melting/freezing temperatures scale linearly with the inverse of the physical size of the material. One of the assumptions in developing this equation, however, is that the ΔH is supposed to be physical size invariant. Experimental observation, on the other hand, revealed that the apparent ΔH reduces with reduction in physical size. For instance, the apparent ΔH of melting of cyclohexane confined to 50 nm porous silica is only 25% of that of the bulk cyclohexane. Plausible presences of molecules that do not participate in the phase transition seem to reconcile the seeming contradiction. In this talk, extension of the same argument, the presence of non-freezing layers, on a polar and a relatively larger molecule (Decanol) will be presented.

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