Colloquium

Fundamental Physics and Nuclear Structure

Prof. Jonathan Engel
University of North Carolina

Wednesday

January 28

4 P.M.

Rm 118 NSH

Physicists are trying to determine the overall neutrino mass scale by observing neutrinoless double beta decay, and to discover new sources of CP violation by measuring atomic electric dipole moments. Experimental results in either program, however, require nuclear matrix elements for their interpretation. The matrix elements cannot be measured and so must be calculated. After outlining the nature and importance of the fundamental physics, I describe the ways in which nuclear-structure theory allows us to calculate the matrix elements, and discuss the accuracy of the results. With the use of new many-body methods and increasingly powerful supercomputers, structure theory has advanced dramatically in the last decade or two. I describe attempts to further the advances and use the resulting methods to obtain fundamental-physics matrix elements with better accuracy.

Refreshments @ 3:30 in 202 NSH

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