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Neutrino Oscillations STEVEN GINDI, State University of New York at Stony Brook, Stony Brook, NY — The objective of my presentation is to describe the new physics behind neutrinos that scientists discovered after battling a problem that lasted for more than three decades. The problem, known as "The Solar Neutrino Problem", was first realized in 1968 when Ray Davis's neutrino measurements suggested a value for the flux of high energy solar neutrinos that differed appreciably from theoretical calculations. The solution to this problem involved understanding new properties of neutrinos such as neutrino oscillations. The theoretical part of my talk will consist of describing such oscillations both in vacuum and in matter. I will also show how oscillations require neutrinos to have masses, suggesting the need to revise the Standard Model of particle physics (which assumes that neutrinos are massless). I will then talk about the different detectors, such as the Super-Kamiokande and the Solar Neutrino Observatory (SNO), that were developed to study high energy (above 5 GeV) neutrino fluxes and that led to the solution of the neutrino problem. Lastly, the importance of future low energy neutrino experiments will be discussed.

Steven Gindi
Sgindi@ic.sunysb.edu
Stony Brook University

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