

Physics Colloquium

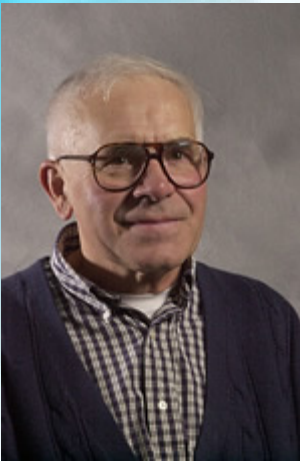
Michigan Technological University

Thursday, March 19, 2009

4:00 pm

Room 139 Fisher Hall

A Review of the Physics Fundamentals of Nuclear Power



Donald Daavettila

**Michigan Tech University
Physics Faculty Emeritus**

Abstract: This presentation reviews the fundamental physics aspects of Nuclear Power from the system input as ore rock to system output electric power. The intent is to show the big picture and will include comments on my personal experiences with nuclear reactor operations and experiments. Chemistry, mathematics, and material science, are all intertwined with the physics in the six topic areas of the talk. The areas are: Ore to fuel, Flux and cross section, The fission event, Reactor theory, Reactor kinetics, and Energy conversion. There is one example calculation of critical mass from first principles. The intent is to deliver a talk which presents the vocabulary and nature of the problems in the design of nuclear power reactors.

Biography: My connection to Nuclear power began in June of 1956 at the Argonne National Laboratory. There in cooperation with Argonne, studied and received a MS degree in Engineering Physics from MTU in 1958. Then I spent four years in study and teaching with the International School of Nuclear Science and Engineering at Argonne. The work was related to nuclear measurements on nuclear reactors. This was followed by a 9 month stint at the Enrico Fermi nuclear reactor. Then in fall of 1964 I joined MTU. My overall teaching experiences includes one year of high school teaching at the Cranbrook schools followed by a variety of physics courses at over the 30 + years at MTU. I retired from MTU Physics in February 2000, but continued teaching part time for some additional years. I have just ended my part time duties as Radiation Safety Officer at MTU in June of 2009.