Advancement in science related to production, storage and use of energy is a key for a secure and sustainable energy future. Scientific breakthroughs are urgently needed in several areas, including (a) generation of electricity without carbon dioxide emissions, (b) utilization of solar energy and (c) efficiency of generation and use of energy. The speaker will discuss possible solutions to energy problems offered by nuclear and particle physics. Nuclear power plants produce a substantial share of electricity worldwide, while physicists continue to develop techniques to enhance security and non-proliferation of nuclear materials. Development of high-power particle accelerators based on superconducting technologies created new opportunities for nuclear industry, namely, Accelerator-Driven Subcritical (ADS) Reactors and accelerator transmutation of nuclear waste. An ADS reactor would use a particle accelerator to burn abundant fuels like Thorium-232 and unenriched Uranium-238 in a power plant. Such a reactor provides high security of operation: Switching off the accelerator brings the fission process to a halt. The speaker will review activities in the US and worldwide toward development ADS reactor technology. A separate example concerns current research in physics of photoinjectors for electron accelerators, which is a focus of study by a consortium based at Thomas Jefferson National Accelerator Facility. Solution of this problem may lead to development of new efficient photovoltaic materials.

TIME: 4:00-4:50 pm, Thursday the 16th of September 2010
PLACE: 101 Corcoran Hall, GWU
725 21st Street, N.W. (Between G and H Streets)
METRO STATION: GWU/FOGGY BOTTOM (BLUE & ORANGE LINES)