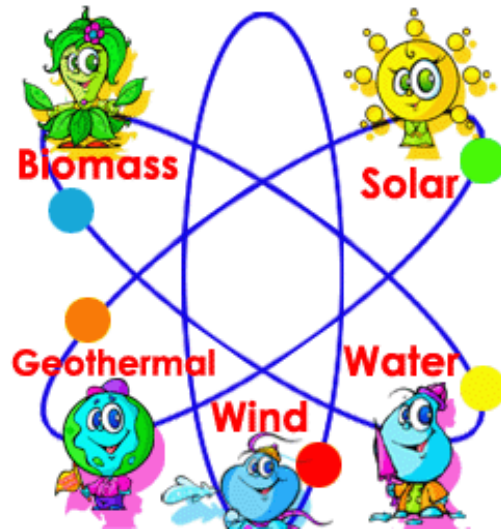# INTERDISCIPLINARY STEM SEMINAR SERIES

(Science Technology Engineering Mathematics)

Energy Resources: Global Consumption and Outlook

Tuesday, October 13th, Reuter Center, Room 102A
4:30 PM to 6:00 PM

Speaker: Richard Wiener, PhD, OLLI

Delivering energy safely and cleanly is a major challenge of the 21st century. Understanding global energy needs is a multidisciplinary effort at the crossroads between geology, engineering, economics, politics, law, and environmental science.

Energy sources include fossil fuels (coal, oil, and natural gas), nuclear, and renewables (hydroelectric, solar, wind, and geothermal). Each energy source has environmental, economic, and energy costs and benefits. Energy choices are based on affordability, availability, reliability, and cleanliness.

Global energy consumption is 500 quadrillion Btu per year, with fossil fuels accounting for 87%. US energy sources include fossil fuels (82%), nuclear (8%), and renewables (10%). In the US, energy is used for Transportation (28%), Industrial and Residential power and heating (33%), and Electricity Generation (39%).

Energy outlooks to 2040 show growth to 800 quadrillion Btu, with coal and oil decreasing, and natural gas, nuclear, and renewables increasing. Consumption is flat in the developed world (OECD), but increasing in developing countries such as China and India. Factors influencing the global energy consumption outlook to 2040 are population growth from 7 to 9 billion, economic growth, doubling of the middle class (especially in developing countries), efficiency (reducing energy demand by 50%), and environmental preference for renewables.