

The PHI BETA KAPPA Society

VISITING



SCHOLAR

PROGRAM

TERI ODOM

NORTHWESTERN UNIVERSITY

Joan Husting Madden and William H. Madden, Jr.
Professor of Chemistry

**PUBLIC LECTURE
OFFERINGS**

THE PROMISE OF NANOMEDICINE

Human health continues to benefit from advances in science, from the sequencing of the human genome to the development of vaccines to the design of drug-delivery vehicles. Nanomedicine—the diagnosis and treatment of disease using nanomaterials and nanotechnology tools—is becoming increasingly important because of the intrinsic advantages at the nanoscale (note: 1 nm = 10^{-9} m, hundreds of times smaller than a human hair). For example, nanomedicine enables enhanced signal contrast in diagnostic testing, which can assist in early detection as well as facilitates precision drug delivery, which can reduce unwanted side effects in therapeutic treatment. This talk will describe how fundamental discoveries can be translated into commercial technologies, including how nanomedicine provided critical interventions for the COVID-19 pandemic, and prospects for the future.

THE COLORFUL NANOWORLD

Color exists in nature and can be human engineered for both beauty and function. There are many different sources of color in the natural world, from molecules (e.g. chlorophyll and hemoglobin) to metal ions in minerals (e.g. ruby and emerald) to ordered structures (e.g. nautilus shells and butterfly wings). This talk will describe colors that derive their properties from their nanoscale size (10^{-9} m, hundreds of times smaller than a human hair). These engineered nanoparticles can interact with light in new ways to produce a rainbow of different colors. We will discuss how these nanoparticles are being used in diverse applications (e.g. COVID-19 tests and advanced flat-screen TVs) as well as their prospects for pressing societal issues.

NOBEL PRIZES IN NANOSCIENCE?

The first Nobel Prize was awarded in 1901. Since then, new Nobel Prizes in Medicine, Chemistry, and Physics are anticipated and celebrated annually by both the awardees and the public. This talk will describe common themes for scientific discovery, challenges in time-of-discovery appreciation, and long-term benefits to society and humankind. We will also discuss how recent awards in Chemistry and Physics (please note: there is not a “Nanoscience” category) are one indicator of how science has evolved and become more integrated over the past decades.

CLASSROOM DISCUSSION TOPICS

1. HOW TO BECOME (EVEN AS A STUDENT) THE RESIDENT EXPERT
2. HOW STEM [SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS] TRAINING IS BENEFICIAL FOR FUTURE LEADERS
3. HOW NANOSCIENCE INTEGRATES SCIENCE AND ENGINEERING DISCIPLINE