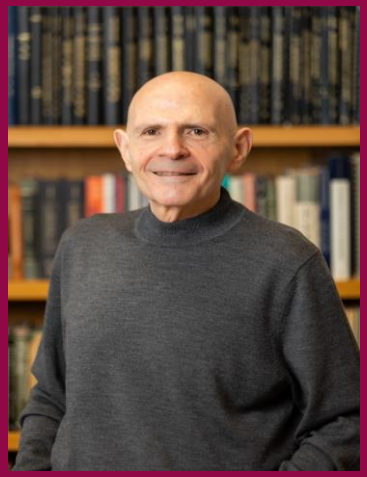
SMS Spring 2025 Eyring Lecture



Samuel (Sam) Stupp, PhD

Professor, Departments of Chemistry, Materials Science and Engineering, Medicine, and Biomedical Engineering
Northwestern University

"Bio-Inspired Supramolecular Design of Materials for Energy and Advanced Medicine"

Thursday, February 20, 2025
6:00 PM
Marston Theatre

The living world utilizes supramolecular materials in which molecules self-assemble through highly specific noncovalent connections programmed by their structures. In naturally occurring materials this organization of molecules occurs within the nanoscale to macroscopic dimensions and leads in many cases to highly dynamic structures that exist within and outside the cells of complex organisms. In this context, our laboratory has focused over the past few decades on bio-inspired supramolecular engineering in order to discover and design new materials. The lecture will discuss three examples of functional supramolecular materials that address critical needs for humans and the planet. The first is inspired by the photosynthetic machinery of green plants, creating materials that harvest light to produce fuels for renewable energy. A second example will report on the development of robotic materials that emulate the motions of living creatures using external stimuli which could be useful in manufacturing. The final topic in the lecture will describe the development of supramolecular biomaterials that mimic extracellular matrices and provide unprecedented bioactivity to regenerate tissues, an extremely important objective in order to offer therapies for devastating injuries, diseases, and healthy aging.

Dr. Samuel Stupp is Board of Trustees Professor of Materials Science and Engineering, Chemistry, Medicine, and Biomedical Engineering at Northwestern University. He also directs Northwestern's Center for Regenerative Nanomedicine.

Dr. Stupp's interdisciplinary research is focused on developing self-assembling supramolecular nanostructures and materials for functions relevant to renewable energy, regenerative medicine, and robotic soft matter. He is a member of the U.S. National Academy of Sciences, the U.S. National Academy of Engineering, the American Academy of Arts and Sciences, the Royal Spanish Academy, the National Academy of Sciences of Latin America, the National Academy of Sciences of Costa Rica, and the U.S. National Academy of Inventors.

Dr. Stupp has won numerous awards over the course of his career, including three American Chemical Society national awards: the Award in Polymer Chemistry, the Ronald Breslow Award for Achievement in Biomimetic Chemistry, and the Ralph F. Hirschmann Award in Peptide Chemistry. He recently received the 2022 Materials Research Society Von Hippel Award, the highest honor awarded by this society. Other awards include the Department of Energy Prize for Outstanding Scientific Accomplishment in Materials Chemistry, the Materials Research Society Medal Award, the Royal Society of Chemistry Award in Soft Matter and Biophysical Chemistry, and the Nanoscience Prize from the International Society for Nanoscale Science, Computation, and Engineering, which recognizes lifelong achievement in the field.

ZOOM Available: https://asu.zoom.us/j/82848108365

ASU School of Molecular Sciences
Arizona State University