Materials Science and Engineering Department

Fall Seminar Series

Semiconductor Quantum Dots and 2D Materials Impact on Human Health and the Environment

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University of Maryland Baltimore County

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11AM-12PM | Hill Seminar Room (LeBow 240)

Semiconductor Quantum Dots have attracted considerable attention by the materials research community due to their unique properties and broad range of applications. The pioneers of this field have been recently awarded the Nobel prize for their discoveries about 40 years ago. 2D materials have also gained considerable attention since the successful formation of a monolayer of graphene in the early 2000. In this seminar I will highlight some of our accomplishments in the area of quantum dots and polymer dots synthesis and their application as bioimaging probes and sensors. I will also discuss recent results of studies to determine at the molecular level the impact of quantum dots and 2D materials on bacterial organisms that are ubiquitous in the environment. I will also describe a newly published mechanistic study of the interactions between polymer nanoparticles and phospholipid vesicles and its implications on our understanding of the interactions between nano plastics and living organisms in the environment.

Prof. Zeev Rosenzweig obtained his BSc in Chemistry and PhD Degree in Physical Chemistry from the Hebrew University of Jerusalem, Israel in 1986, and 1992. His PhD studies focused on understanding the surface chemistry of metal catalysts under ultrahigh vacuum (UHV) and high-pressure conditions using non-linear optical methods. He was a postdoctoral research associate at Iowa State University and at the University of Michigan between 1992 and 1995 where he gained experience in the areas of analytical laser spectroscopy and nanoscale optochemical sensors. In 1995, he joined the Department of Chemistry at the University of New Orleans as an Assistant Professor where he developed a research program in the area of nanomaterials chemistry. In 1999, Prof. Rosenzweig obtained an NSF CAREER award to develop nanometric luminescent probes for biological assays and cellular studies. He rose through the academic ranks at the University of New Orleans and became an Associate Professor in 1999 and Full Professor in 2002. In 2005, at the aftermath of Hurricane Katrina, Prof. Rosenzweig joined the National Science Foundation (NSF) and served as Program Director in the NSF Chemistry Division between 2005 and 2013. During his NSF service, he continued to publish scientific articles in the field of luminescent nanomaterials. During his tenure at the University of New Orleans, Professor Rosenzweig published 65 peer reviewed research articles and book chapters. He graduated with 10 PhD and six MSc students, and provided training opportunities to 25 undergraduate students, high school students, and teachers in his laboratory. In 2014, Prof. Rosenzweig joined the Department of Chemistry and Biochemistry at the University of Maryland Baltimore County, where he is currently building a new research program in the area of nanomaterials chemistry with particular emphasis on nanomaterials safety and sustainability. He served as Department Chair from 2014 to Fall 2020.

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