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ΔΙΑΛΕΞΗ

‘Nanostructured Hybrids for Energy Applications’

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Αίθουσα σεμιναρίων στο ισόγειο του ΕΙΕ

NANOSTRUCTURED HYBRIDS FOR ENERGY APPLICATIONS

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Abstract

In recent years, “storm clouds” have been forming at the interface of energy resources, environment, and climate change that demand concerted action by scientists, engineers, and policy makers. In this talk I will present a new materials platform based on organic-inorganic nanocomposites that provides unusual technological opportunities for addressing some of these challenges. Because of their hybrid nature, the properties of the nanocomposites can be tailored over an unusually wide range. On one end of the spectrum are materials, which display properties similar to crystalline solids, stiff waxes, and gels. At the opposite extreme are particle-based ionic fluids characterized by transport properties remarkably similar to simple liquids but with negligible vapor pressures. These features are advantageous for a broad range of applications, including sorbents for CO₂ capture, membranes for water purification, heat transfer fluids for solar to thermal conversion systems, fluorescent tracers for oil exploration and components for fuel cells and batteries.

Short Bio

Emmanuel P. Giannelis is the Walter R. Read Professor of Engineering at Cornell University. He is also a visiting Professor at KFUPM. He received a BS degree in Chemistry from the University of Athens, Greece, and a Ph.D. in Chemistry from Michigan State University. His research interests include polymer nanocomposites, nanoparticle fluids, and nanomaterials for energy conversion and storage. He is currently the Director of the Department of Materials Science and Engineering and the co-Director of the KAUST-CU Center for Energy and Sustainability.

Giannelis serves or has served on the editorial boards of *Small*, *Polymer*, *Chemistry of Materials*, and *Macromolecules*. He is a member of several professional organizations and a corresponding member of the European Academy of Sciences. He is the author or co-author of about 215 papers/book chapters and 11 patents and he has delivered more than 450 invited talks and seminars. He is a highly cited author in Materials Science (<http://www.ISIHighlyCited.com>) and he is listed as one of the top 25 cited authors in Nanotechnology by ISI (<http://www.esi-topics.com/nano/index.html>).