

## **Merck's Seminars**

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### **Spectral Converters for Luminescent Solar Devices**

Light is ubiquitous in the urban environment – from the sun that shines down upon us to the artificial sources that light-up our devices and homes. While some of this light is used very effectively, for example by plants in the process of photosynthesis, much of it is wasted, due to inefficient harvesting of the broad spectrum of wavelengths available. Spectral conversion materials provide a potential solution to this problem, using a photoluminescence process to convert available photons into energies that can be used more effectively.

In this talk, recent highlights from our research into the design of integrated luminophore-host systems as spectral conversion materials will be presented. It will be shown that materials chemistry strategies can be used to control the packing, orientation and placement of light-emitting species (luminophores) in solid-state hosts, which in turn enables selective tuning of the optical properties. These materials also provide additional features such as concentration of diffuse light, improved mechanical properties and the potential to retrofit existing photovoltaic installations. This exciting opportunities for spectral conversion materials in an array of applications, from functional architecture to data transfer and indoor photovoltaics, will be discussed.