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Introduction RTG 2767 " **Supracolloidal Structures: From Materials to optical and electronic devices**"

Supracolloidal structures have been shown to possess unique optical and electronic properties and are regarded of high potential for device applications. However so far, device integration of these structures is lacking in most cases. In order to unlock the potential of supracolloidal structures for electronics, optics, and sensing, intense collaboration between scientists from the areas of particulate materials (comprising the fields of nanoparticle synthesis, colloidal science, nanoanalytical methods, and biomolecular assembly techniques) and particle-based devices (comprising the fields of device integration / fabrication, (bio-)sensing, nanoelectronics, nano-optics, and optoelectronics) is crucial. Within RTG 2767, we will establish an interdisciplinary educational framework and ensure strong communication between experts from these areas.

Thus, we will go beyond a sole proof of concept of properties and functionalities but rather establish the integration of supracolloidal structures into devices. This will require the usage of new materials, the adaptation of synthesis and assembly protocols for specific device functionalities, and the development of strategies for their integration / placement. This will finally facilitate a new generation of devices, which excel in their energy efficient assembly, adaptivity, reconfigurability and the unique optical / electronic properties of nanoscopic 3D heterostructures.