Conjugated Polymer Nanoparticles for photonic applications

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am: 07.05.2020
um: 16:00 Uhr
wo: 1/232 (Straße der Nationen 62)

Gäste sind herzlich willkommen!

„Treffen mit dem Vortragenden“
Kaffee und Kekse ab 15:30 Uhr
im Hörsaal 1/232

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Monodisperse conjugated polymer particles represent powerful materials for self-assembled photonics due to their high gain and facile tunability. Moreover, conjugated polymer particles represent high potential imaging probes for biomedical analysis and diagnosis due to their low cytotoxicity together with their high contrast in fluorescence and photoacoustic tomography.

I will present the synthesis of such highly fluorescent particles, which fully consist of π-conjugated polymers. I will discuss more advanced core-shell and multi-shell geometries and their applications in lasers. I will also investigate the concept of thermally activated delayed fluorescence in these geometries. In the realm of bioimaging, I will show how the particles can be surface modified for targeting towards specific cells, or pathological tissue in the body to specifically label the targeted entities.

Furthermore, I will show a concept for making conjugated polymers biodegradable either for in-vivo applications, where macrophages can degrade the particles or by composting bacteria that would decompose the particles into environmentally benign degradation products. I believe that this concept can be extended for other applications in transient organic electronics and optoelectronics at the biointerface.