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# Molecularly Engineered Light-Adaptive Bioinspired Nanocomposites (extension)

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch Fortsetzungsanträge)

Bewilligung: 09.04.2018

Laufzeit: 3 Jahre

Projekt-Website: www.macroarc.org; www.walther-group.com

The project aims for breaking new ground in the field of precision-engineered molecular control mechanisms, embedded in tailor-made polymers, allowing to reach light-adaptive steady state properties far from the equilibrium in highly reinforced bioinspired nanocomposites. In addition to achieving distinct functional plateaus in light intensity-adaptive nanoclay/graphene nacre-mimetic nanocomposites, the team will pioneer crustacean-mimetic materials with wavelength-selective light adaptation by exploiting photothermal effects generated by plasmonic gold nanorods (Au-NR) of tunable aspect ratio co-assembled in self-assembling cholesteric cellulose nanocrystal/polymer nanocomposites. In both cases the photothermal effects (graphene and Au-NR) will be coupled to thermoreversible transitions in dynamic covalent bonds engineered on the molecular scale to feature different transition temperatures. On a functional level, the understanding to create light-adaptive steady state mechanical and photonic properties will be exploited.

**Projektbeteiligte**

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**Open Access-Publikationen**

**Electrical switching of high-performance bioinspired nanocellulose nanocomposites**