Molecular Engineering of Helically Chiral Functional Molecules: Materials for Next Generation (Opto)electronics

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In the era of miniaturization—aiming to build ever smaller and more efficient optical, electronic, and mechanical devices—there is an increasing demand for multifunctional materials, which can respond to multiple external stimuli simultaneously. To address this challenge, we aim to explore ways to custom-build multifunctional molecules by taking advantage of chirality—a property of molecules related to their symmetry. The introduction of chirality in π-conjugated organic compounds gives rise to properties such as absorption and emission of circularly polarized light, magneto-chiral anisotropy, and spin-selective charge transport, which enable the conceptualization of novel functions and applications.

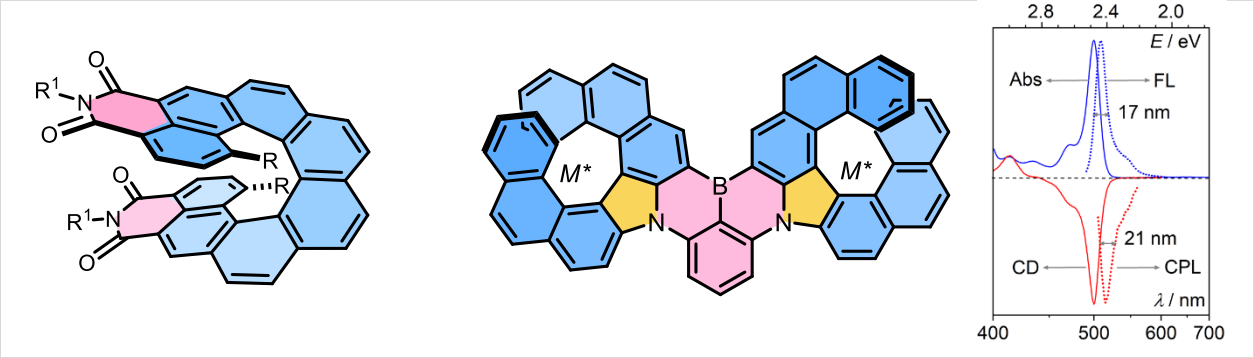

Figure 1: Helicene based functional chiral molecules and narrowband FL & CPL from helicenes.

My presentation will focus on—1. A novel class of [*n*]helicene diimides features through-bond and through-space interactions. 2. Unprecedentedly narrowband fluorescence (FL) and circularly polarized luminescence (CPL) from 1,4-B,N-embedded helicenes.

References:

[1] *Angew. Chem. Int. Ed.* **2023**, *62,* e202218965.
[2] *Angew. Chem. Int. Ed.* **2021**, *60,* 23656–23660.
[3] *Chem. Eur. J.* **2021**, *27*, 3957–3967.
[4] *Org. Lett.* **2021**, *23,* 1339–1343.
[5] *J. Am. Chem. Soc.* **2020**, *142*, 21298–21303.
[6] *Chem. Eur. J.* **2019**, *25*, 16241–16245.