Postdoctoral position in Charles University, Prague, Czech Republic
Synthesis of Chiral Helical Hydrocarbons for Material Science

Chiral helical compounds are a class of aromatic hydrocarbon substances with defined 3D structure and are potential advanced intermediates for preparation more complex compounds with potential application in organic electronics and optics.

The project is focused on development of new class of such compounds: helical 5,8-di(spirofluorenyl)-indeno[2,1-c]fluorenes (DSFIF) and their helical congeners with extended π-systems. These compounds combine properties of helicenes (aromatic compounds with a rigid helical scaffold) and compounds with spiro-junction (so called spiro effect that essential for desirable photopoptical properties such high fluorescence).

As the main route to this class compounds will be explored intramolecular catalytic cyclotrimerization by using chiral transition metal complexes that should yield directly products with the defined chiral scaffold. Further transformations should give rise to the target aromatic compounds. The integral part of the project will be also studies regarding evaluation of their optophysical, as well as other physical properties (tunable fluorescence emission, quantum yields, emission of circularly polarized light, etc.).

These studies will performed with the in house equipment. As far as other synthetic modifications are concerned, it is expected to expand the developed methodology for synthesis of the hitherto unknown helically chiral metalloorganic compounds that should have improved optophysical properties. Preliminary experiments by using model compounds have provided sufficient evidence to confirm feasibility of the project: a) cyclotrimerization proceeds with high yields, b) the products are highly fluorescent, c) products are configurationally stable, d) they emit circularly polarized light, and last but not least e) the target compounds can be access with high overall yields in 5-6 steps.


Profile of an ideal candidate:
- Completed PhD or a fixed date of PhD defense
- Excellent knowledge of English (FCE equivalent or better)
- Strong background in organic chemistry
The applicant should provide the following documents before 1.8.2019 to the project supervisor and in copy to email foreign@natur.cuni.cz:

- Application Form
- Letter of Reference
- Detailed CV
- List of publications
- Copy of university diploma