

### **Project 2.3. Modular, polycyclic aromatic hydrocarbons (PAHs) based on cyclazines: new materials for optoelectronic applications**

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**Institute:** Institute of Organic Chemistry, PAS, Warsaw

**Unit:** Team X/XB; Synthetic Dyes

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#### **Background:**

- 1) Design of synthetic pathways towards targeted molecules
- 2) Synthesis of anticipated molecules containing cyclazine moieties
- 3) Purification of obtained compounds via routine methods including column/flash chromatography, crystallization, precipitation, trituration.
- 4) Spectroscopic and spectrometric analysis of synthesized species and interpretation of obtained outcomes.
- 6) Basic photophysical analysis by optical (UV/Vis, fluorescence) spectroscopies

#### **Aim:**

The main goal of this project is to develop a novel class of boron- and nitrogen doped (BN), electron deficient heterocoronenes characterized by the unusually long lifetime of the excited state, which are also envisaged to exhibit emissive properties typical for NIR active dyes. Thus, new libraries of pyrrolemonoimide- and cyclazine based heterocoronene architectures comprising rationally implemented boron and nitrogen dopants will be synthesized. In order to fine-tune their optoelectronic properties, a great emphasis will be put to investigate a correlation between the heteroatom (BN) doped structures (with regard to the number and the topology of atoms) and their photo-physical characteristic.

#### **Requirements:**

A candidate is supposed to hold:

- 1) Master of Science in Chemistry or Physics,
- 2) Solid background in organic synthesis including transformations mediated by transition-metal complexes, chemistry of heterocycles,
- 3) Experience in interpretation of NMR/IR/UV-Vis, and MS spectra,
- 4) Good training in column chromatography separation,
- 5) Very good written and oral skills in English,
- 6) A great motivation to work under applied time frame