

NCN RESEARCH SCHOLARSHIP - JOB OFFER

OPUS-29 National Science Centre, Poland (NCN), proposal no. 2024/55/B/ST5/02894

Position code: OPUS-29 / PhD-1 / EN

Position: PhD student (NCN scholarship holder)

Principal Investigator: Dr. hab. Michał Wójcik

Host institution: Laboratory of Synthesis of Organic Nanomaterials and Biomolecules, Faculty of Chemistry, University of Warsaw

Project title:

Advanced structural control and long-range organization of magnetic and magnetically doped nanoparticles in liquid crystal systems for adaptively tuned, multi-stimuli responsive reconfigurable materials

About the project

The RESPO-MAG project addresses the synthesis and study of a new class of hybrid magnetic materials in which magnetic nanoparticles (including SPIONs, Fe, Co, Mn-doped ZnO) are coated with functional organic ligands: pro-mesogenic (liquid-crystalline), photoswitchable (spiropyrans) and supramolecular (crown ethers). The goal is to obtain long-range ordered thin-film systems capable of reversible reconfiguration under temperature, UV light and chemical stimuli — with applications in spintronics, quantum technologies and optomagnetic materials. The project is carried out in collaboration with the group of Prof. Vasily Temnov (Institut Polytechnique de Paris, CNRS).

About the position

We are seeking a candidate for a PhD project focused on the organic synthesis of functional ligands (pro-mesogenic, photoswitchable spiropyran-based, and supramolecular crown-ether-based) and their grafting onto magnetic nanoparticles. The position is part of the synthetic core of RESPO-MAG (work packages M1, M3, M4, M5, M6).

Scholarship amount: PLN 4,000 per month (NCN research scholarship)

Funding period: up to 36 months (contract granted for periods of up to 12 months with possibility of extension, total maximum 36 months within the project)

Scope of duties

- multi-step synthesis of pro-mesogenic ligands (aromatic cores, amide linkers, anchoring groups: phosphonic, dopamine-type or carboxylic);
- synthesis of spiropyran derivatives bearing different terminal chains and anchoring groups;
- synthesis of 18-crown-6 ether derivatives (and optionally 12-crown-4) functionalized with phosphonic anchors;
- ligand exchange reactions on magnetic nanoparticles produced by the second PhD student;

- purification and structural characterization of synthesized compounds: NMR (^1H , ^{13}C , ^{31}P), MS, FT-IR, UV-Vis, fluorimetry, TLC/HPLC;
- investigation of paramagnetic ion complexation (Fe^{3+} , Mn^{2+} , Ni^{2+}) by supramolecular ligands and the merocyanine form of spiropyran;
- study of photoswitching properties (UV/Vis) of spiropyran ligands in solution and in hybrid systems;
- collaboration with the postdoc on structural studies (SAXS/WAXD) of liquid-crystalline systems;
- co-authorship of peer-reviewed publications and presentation of results at national and international conferences.

Mandatory requirements

- MSc degree in chemistry or a related field (obtained before the start of the scholarship);
- status of a PhD student in a doctoral school in the discipline of chemical sciences, or candidate status accepted to start doctoral education in the academic year 2026/2027 (mandatory under the NCN Regulations for awarding research scholarships);
- documented hands-on experience in multi-step organic synthesis (BSc/MSc thesis, internships, student projects);
- fluency in interpreting NMR, MS, FT-IR and UV-Vis spectra;
- ability to plan synthesis and work independently in the laboratory;
- good command of English (reading scientific literature, scientific writing).

Preferred qualifications (additional assets)

- experience in the synthesis of liquid-crystalline compounds or supramolecular hosts (crown ethers, calixarenes, cryptands);
- experience with photoswitchable systems (azobenzene, spiropyran, diarylethene);
- experience with chromatography (FCC, HPLC) and crystallization;
- documented scientific achievements (publications, conference contributions, awards);
- experience in nanoparticle surface functionalization.

What we offer

- place of work: Faculty of Chemistry, University of Warsaw, Pasteura 1;
- NCN research scholarship of PLN 4,000 per month;
- funding period: up to 36 months within the project;
- scholarship start: from 1 July 2026;
- funding for participation in national and international conferences and research visits to the partner group (Institut Polytechnique de Paris);
- access to state-of-the-art instrumentation at the Faculty of Chemistry, UW (NMR, SAXS/WAXD, TEM, SQUID, MFM, glove box);
- work in a team with a strong publication record in functional hybrid nanomaterials (ACS Nano, Adv. Mater., Angew. Chem. Int. Ed., Small, among others);
- opportunity to develop a PhD thesis spanning organic, supramolecular chemistry and nanotechnology.

Required documents

- cover letter (max. 1 page) explaining motivation and interest in the project topic;
- academic CV including educational background and prior research experience;
- summary of scientific achievements (publications, conference contributions, awards, internships, participation in research projects);
- confirmation of student/PhD student status (certificate from the dean's office or doctoral school) - may be provided before signing the scholarship agreement;
- signed consent for processing personal data for recruitment purposes [Klauzula-informacyjna-przy-rekrutacji-do-pracy_11_2019_EN.docx](#) .

Deadline and submission procedure

Application deadline: **17 May 2026 (end of day)**.

Applications should be submitted electronically to: mwojcik@chem.uw.edu.pl with the position code and the candidate's surname in the subject line, e.g. "OPUS-29 [CODE] - Smith".

All documents should be combined into a single PDF file.

Recruitment procedure and evaluation criteria

The competition is conducted in accordance with the NCN Regulations for awarding research scholarships in research projects funded by the National Science Centre, Poland (Council of NCN Resolution no. 25/2019 of 16 May 2019, as amended).

Applications are evaluated in two stages: (1) formal evaluation - completeness of documents and fulfilment of formal requirements; (2) substantive evaluation by a recruitment committee appointed by the PI (committee of at least three members including the PI and two persons indicated by the PI, holding a PhD or higher academic degree, with research experience relevant to the project area).

Substantive evaluation criteria: (1) scientific achievements of the candidate, including publications, conference contributions, awards, prior research work (50%); (2) substantive and technical competences relevant to the position (30%); (3) prior research scholarships, awards and distinctions (10%); (4) the cover letter and a possible interview (10%).

Selected candidates may be invited to an interview (in person or remotely).

Candidates will be informed of the results of the competition by e-mail within 14 days of the application deadline.

The competition may be cancelled without giving reasons or may be left without a final selection.