Job offer for the OPUS 28 National Science Centre (NSC) project

L-SWITCH: towards tailor-made molecular switches for specific applications – understanding of transition-metal coordination compounds with ambidentate ligands.

Institution: **University of Warsaw, Faculty of Chemistry**

Position: **PhD student – scholarship holder**

Number of positions: **1**

Requirements:

1. Master's degree in chemistry o related sciences.
2. Good practical knowledge of basic crystallography and spectroscopy (single crystal preparation, X-ray diffraction measurements, spectroscopic measurements of crystalline and solution samples). *Synchrotron experience is more than welcome.*
3. Basic organic/organometallic synthesis skills.
4. Good knowledge of physics and/or physical chemistry.
5. Good English language skills.
6. *Programming skills, in languages such as Python and/or C++, and knowledge of chemical software (Gaussian, CRYSTAL, etc.) will be an asset.*
7. *Commitment to scientific research, ambition, passion, and ingenuity are welcome.*

Duties:

1. Performing simple organic/organometallic syntheses and growing crystals of the resulting products.
2. Performing X-ray diffraction measurements on a single-crystal diffractometer.
3. Participating in synchrotron measurements.
4. Performing spectroscopic measurements, with particular emphasis on the time-resolved experiments (*e.g.* luminescence).
5. Crystallographic and/or spectroscopic data processing and analysis.

Project description:

The project is dedicated primarily to investigate the factors crucial for the photo- and pressure-induced switching activity of model representative transition-metal complexes with ambidentate ligands and understand the structure-property relationships. For that purpose 3 groups of compounds were selected, *i.e.* (I) square-planar nitrite complexes of Ni, Pd, Pt, Cu, or Rh, (II) octahedral nitrite complexes of Ni, Co, Fe or Ru, (III) modifications of the first two groups with the SO_2 ambidentate ligands, or mixed NO/NO_2, *etc.* The first group of compounds constitutes a continuation of our earlier studies on square-planar nickel nitro complexes with the (*N*,*N*,*O*)-donor ancillary ligands, however, will be extended towards other classes of this kind of compounds, including mainly these with pincer-type supporting ligands. The second group originates from promising preliminary results for octahedral Ni^{II} (high-pressure-induced molecular switching) and Co^{II} complexes (photoswitching potential at room temperature), both coordinated by multiple nitro groups. Finally, the third group will enable studies of the SO_2 switching activity and also comparison of the effect of various ambidentate ligands, molecular charges, etc. These compounds are also prone to exhibit interesting magnetic, or spectroscopic properties (colour change, *etc.*). The choice of compounds shall facilitate testing of numerous factors that affect, or govern switching properties of this kind of systems, and investigating the isomerisation reaction mechanism in the case of various compounds and crystal environments. In consequence, such gained knowledge and understanding may enable us to design materials with specific properties and switching activity under desired conditions.

NSC programme type: **OPUS 28 (ST panel)**

Application deadline: **June 1st, 2026, 23:59:59 CET**

Application submission method: **e-mail**

Scholarship conditions:

The scholarship amounts to **5,000.00 PLN** per month (if the candidate is admitted to the Doctoral School within the place limit and receives a doctoral scholarship). The expected start date is **October 1st, 2026**. The scholarship duration is **24 months** with the possibility of extension.

Additional information:

Applications should be submitted by **June 1st, 2026** (**11:59:59 PM**, *end of day*) exclusively via email to: **katarzyna.jarzembska@uw.edu.pl**. The email should be titled as follows: "OPUS 28 PhD student - Name Surname". The application must include (*only **PDF** files will be accepted*):

1. A concise CV (1-2 A4 pages).
2. A cover letter relating to the research group's subject matter (www.photocrystallography.eu).
3. Contact details for one person who can provide feedback on the candidate (*please do not submit feedback yourself*).
4. Information on the personal data processing (available for download: https://www.chem.uw.edu.pl/wp-content/uploads/2025/03/Informacja-dotyczaca-przetwarzania-danych-osobowych_EN.pdf).

The best candidates will be invited to an interview around **mid-June** (interview invitations will be sent via email by *June 10th, 2026*). The **selection committee's decision** will be communicated to candidates via email no later than **June 26th, 2026**.

For more information, please contact the project manager – Prof. **Katarzyna Jarzembska**, PhD DSc (**katarzyna.jarzembska@uw.edu.pl**).