

Applications are invited for **1 PhD position (4 years, full time, EEA + CH students) in the DyeSICPhoto (Dyes with Switchable Intersystem Crossing for Photonics) project**. The project is led by Dr. Mikhail Filatov (TU Dublin) and Prof. Mathias Senge (Trinity College Dublin).



Project: DyeSICPhoto aims develop a conceptually new type of functional dyes with programmable excited state behavior and to unlock their practical potential in photonics. This will be achieved by optimization of the spin-orbit charge transfer intersystem crossing (SOCT-ISC) process in electron donor-acceptor molecules. In such systems, fluorescence and triplet state quantum yields depend on the charge transfer process and thus can be finely controlled. Dyes will be designed to operate either as bright fluorophores or photosensitizers transferring energy to other molecules, depending on environmental parameters, applied external stimuli, or activating species. In addition to having significant fundamental importance for understanding the photophysics of organic molecules this work will afford advanced molecular systems and materials with high added value for biophotonics and energy conversion. To demonstrate the potential in biophotonics we will use these systems as smart sensitizers for photomedical treatments and imaging probes for reactive oxygen species in living cells. Alternatively, new dyes will be used as components of multichromophoric assemblies capable of efficient light energy harvesting and conversion, for solar cells efficiency enhancement through the process of triplet-triplet annihilation upconversion.



Trinity College Dublin  
Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



### Requirements for candidates:

EEA, CH, or UK citizens

Minimum upper second-class degree (2.1) BSc degree in Chemical Sciences or equivalent.

Ideally the applicants will have demonstrated:

- desire to discovering new knowledge, genuine interest in chemistry and strong competence of organic chemistry
  - creativity and ability to work with a high degree of independence in an international setting
  - training and/or laboratory experience in organic synthesis and spectroscopy
  - very good interpersonal and collaborative skills, commitment to work in diverse and multicultural groups
  - good command of the English language, both written and spoken (minimum required: 6.0 in the IELTS test)
- Experiences in photochemistry and photophysics are merits.

**Students will be enrolled at TCD under the supervision of Prof. Senge.**

### Benefits and salary

Postgraduate stipend of €18,500 per annum and EU level fee contributions (EEA + CH + UK) in accordance with the SFI Grant Budget Policy. The DyeSICPhoto team members will receive state-of-the-art science/technology training in advanced organic synthesis, optical spectroscopy, and applications of functional dyes. This will kick-start their careers as highly employable professionals in the EU and beyond. In addition to their individual scientific projects, all students will benefit from further continuing education, which includes research internships and international secondments, a variety of training modules as well as transferable skills courses and active participation in workshops and conferences. Participation in STEM outreach and collaborative research projects and grant initiatives is expected.

Applications: Motivation letter, diversity statement, 2 reference contacts, and full CV (merged into a single PDF file) via e-mail to [sengem@tcd.ie](mailto:sengem@tcd.ie)

The position is open until filled, but vacancies may be filled earlier if suitable candidates are identified, so early application is recommended; latest possible start date is 01/03/2023.

For more details about the supervisors' research interests, recent publications, etc. see <https://mihafil.github.io/academic/research/>  
<http://www.sengegroup.eu/>