



PhD position n°1 - Novel molecular systems for high CISS effect

Université Libre de Bruxelles - Free University of Brussels - (ULB) is a major academic institution with international recognition for scientific achievements, see <https://www.ulb.be/>

The group of **Prof. Yves Geerts** is active in the design, synthesis, processing and characterization of advanced molecular materials with unprecedented properties, see <http://chimpoly.ulb.be/>

CISSE is a multi-site Doctoral Network supported by the European Commission through the Marie Skłodowska Curie program, aimed at enabling finest quality research training and transfer of knowledge in an interdisciplinary, inter-sectoral, and revolutionary research field. The CISSE consortium members carry out research at the forefront of a number of interlinked theoretical and experimental disciplines involving: molecular design, synthetic chemistry, organic materials, nanoscience, electrochemistry, chirality, surface chemistry, industrial scale up, development of analytical methods and instrumentation. CISSE offers a training program in which theoreticians, spectroscopists, synthetic chemists, physicists, & industrialists will work on the complex and unsolved questions related to chirality and spin. CISSE gathers an interdisciplinary network of experts, from 6 universities and 2 industrial organizations, who will deliver a high-level doctoral education to 10 DCs. 6 associated partners (4 academics, 1 non-profit cultural organization and 1 private company) will complete their scientific and managerial training. CISSE will educate DCs as professional scientists, but also as innovators and future leaders. The intensive training program that takes advantage of two secondments offers DCs the unique opportunity to carry research at the forefront of science.

Objective of the PhD thesis: To design, synthesize, and characterize molecular systems magnifying **Chiral-Induced Spin Selectivity (CISS)** effect.

Expected results: Synthesis of chiral molecular systems with open shell structures. Enantiomeric separation and assessment of e.e. > 99% for mono- and di-radical compounds. Variation of the size of polarizable aromatic core to modulate exchange interactions between localized radicals and delocalized π -electrons. Elucidation of crystal structures. Fabrication of highly ordered thin films. Characterization of magnetic properties in presence and in absence of external electric field. Quantification of CISS effect by various complementary methods, including spin polarized AFM, SQUID, Hall effect, and photoelectron spectroscopy with a Mott polarimeter.

Applicant profiles: Synthetic chemist with a sound knowledge of organic chemistry, physical chemistry and materials sciences. To register to the doctoral program, the candidate must own a Master Degree in chemistry equivalent to the one delivered by ULB. Specifically, must have received a sound education in chemistry covering the fields: general chemistry, physics, mathematics, biology, earth science, mineralogy, crystallography, equilibrium thermodynamics, kinetics, biochemistry, analytical chemistry, inorganic chemistry, organic chemistry, spectroscopy, quantum mechanics, statistical mechanics, non-equilibrium thermodynamics, physical chemistry, and polymer chemistry.

Gross salary: For European Union citizens, the gross monthly salary of €2680 that roughly corresponds to a net monthly salary of €2350, to which a mobility allowance of €600 adds, corresponding to a total of €2950 per month. For non-European Union citizens, the gross monthly salary of €2764 that roughly corresponds to a net monthly salary of €2642, to which a mobility allowance of €600 adds, corresponding to a total of €3242 per month.

How to apply? Please, follow the application procedure described in the recruitment leaflet available at www.cisse-msca.eu