Call for Post-doctoral Research Fellow position open. Full contract for three years and salary 7000 PLN to work on advanced organic synthesis of heterocyclic lanthanide complexes and basic spectroscopic characterization, within the NCN Opus 9 project entitled:
“Innovative photoluminescent terbium and europium complexes for advanced biomedical diagnostics” registration No.: 2015/17/B/ST5/01038 (2016 -2018),
Deadline for applications: 26 February 2016

Project abstract:
Scientific problem aimed to be solved: The aim of the project is the design and development of new, universal luminescent probes based on an organic antenna-inorganic lanthanide cation complex, in which either terbium or europium is a central lanthanide cation. This new class of complexes will be resistant to the degradation effects in biochemical environments such as plasma or cerebrospinal fluids as well as in buffered aqueous solutions such as citrate buffer, phosphate buffer, phosphate buffer saline (PBS), HEPES buffer, bicarbonate-carbonate buffer and sodium borate buffer. Moreover, the complexes will possess at least one functional moiety to facilitate uncomplicated labeling with biomolecules such as antibodies, proteins or deoxyribonucleic acid (DNA). Project Leader has a long experience (back to mid-eighties of XX c.) in the design, synthesis and photoluminescence studies of lanthanide complexes (two KBN projects, IP FP6 „OLLA” Project, FP7 ITN M. Curie „FINELUMEN” Project), recent papers: J. Mater. Chem. C, 2013, 1, 8028 -8032, IF 6.1, Chem. Commun., 2011, 47, 1625-1627, IF 6.169. Initial photoluminescence studies of Tb³⁺ complexes based on tetraazatriphenylene, synthesized by us, exhibited the record-breaking photoluminescence quantum yields: 97% in the solid state and above 70% in solution.
Methodology: 1) design and synthesis of π-electronic sensitizers based on pyridine, and 1,10-phenanthroline derivatives with the excitation possibilities at 350-450 nm, 2) four (or more) side-arms bearing phosphonic groups binding lanthanide cations attached to the “core” systems, 3) the active group to be attached to the sensitizer for bioconjugation (e.g. NH₂). The side-arms, contrary to currently applied, will not contain aliphatic nitrogen atoms, susceptible for interactions with solution media. Phosphonic groups in side-arms will ensure the stability of the complexes in all media, 4) photoluminescence and stability studies of complexes, 5) biomedical studies in cooperation with the Fraunhofer Institute, Potsdam (project added value). Examples of proposed complexes and diagnostic method, based on Förster Resonance Energy Transfer (FRET):
Chemical structure of newly developed Tb complex based on 2,6-diaminopyridine unit

Chemical structure of newly developed Tb complex based on 2,6-dihydroxypyridine unit

**Tasks description:**

**Task 1:** The synthesis and analytical characterization of a set of photoluminescent Eu(III) and Tb(III) complexes bearing 1,10-phenanthroline derivatives.

**Task 2:** Spectroscopic studies of the complexes with 1,10-phenanthroline ligands: UV spectra, fluorescence, phosphorescence, photoluminescence quantum yields and lifetimes, determination of excited states $S_1$ and $T_1$ energy levels, photostability, stability in buffered media

**Proposed ligand structures:**

![Proposed ligand structures](image)

**Requirements**

1. Ph.D. degree in chemical sciences awarded not earlier than five years before the deadline of the present call.
2. Excellence in organic synthesis, optical spectroscopies, particularly fluorescence, quantum-chemistry modeling, excellence in English.

**Complete application should include:**

1. Employment application.
2. CV with a short elaboration about scientific career of the candidate: list of publications, number of citations (without self-citations), H-index, and the number of years of research activity.
3. University degree and PhD diplomas.
4. Information about intermissions in scientific career, e.g., maternity leave, job in industry, etc.
5. List of research projects led by the candidate
6. At least one recommendation letter about candidate written by a professor/supervisor.
7. Letter of motivation with respect to the research indicated above. As part of the recruitment procedure, the Recruitment Commission may invite candidates to present their achievements in the Institute of Physical Chemistry PAS, and/or for the interview.

Applications with all requested documentation in the form of pdf files, or scanned-to-pdf (diplomas) should be sent by e-mail to Prof. Marek Pietraszkiewicz (mpietraszkiewicz@ichf.edu.pl) not later than 5.00 p.m. of 26th February 2016.