PhD Fellowship in 'Micro-Nano-Magnetics'

Tyndall National Institute
Institiúid Náisiúnta
Cork, Ireland
www.tyndall.ie

Title – PhD Fellowship in "Micro-Nano-Magnetics for integrated device applications"

Project: The rapid growth of miniaturized handheld electronic devices & 'Internet of Things-IoT' has highlighted the issue of efficient powering and transmission at ultra small scale. Lately, integrated micro-nano-magnetic devices have become core building blocks of such miniaturized/monolithic powering & transmission devices such as highly miniaturized electromagnetic transducers (magnetic-MEMS), nano-oscillators (SHNO/STNO), antenna (Magnonic, NEMS) etc. The focus of the present project will be on modeling, development and characterization of such devices, suitable nano-structured magnetic materials using patterned structures on Si/SOI in a CMOS compatible technique, while identifying & analyzing relevant exchange coupling phenomena in multi-nano-layers of patterned magnetic nano-hetero-structures.

Position available: PhD Position: Applications are sought for a four year PhD position with fellowship (€18,500/annum - tax-exempted + Tuition fees (€5,500/annum), will be paid from the project) under supervision of Prof. Saibal Roy in the 'Micropower Devices & Nanomagnetics' research group, Tyndall National Institute, University College Cork (UCC), Ireland. The successful applicant will work as part of a multidisciplinary team with a focus on the development of integrated micro-nano-magnetic devices.

The research of this particular position will involve elements of the following;

- Review of state of the art (publications in Journals and Patents)
- Electromagnetic modelling (MuMax3, COMSOL) of micro-nano-magnetic structures
- Development of nano-structured magnetic materials in relevant chemical (electroplating, CVD) /physical (DC & RF Sputtering, ALD, PVD) synthesis techniques
- Characterization (structural- XRD, SEM, AFM, TEM etc, and magnetic- including static & dynamic – SQUID magnetometer, MFM etc) of nano-structured magnetic materials and their analysis
- Device batch fabrication using microfabrication techniques on Si (Photo/ Ebeam-lithography)
- Characterization (electrical, magnetic) of fabricated devices

Requirements: Qualifications: a) Masters (or Bachelors with high grade) degree in Physics/ Chemistry/ Materials Science/Electrical/Electronic Engineering or similar with high grades.
b) Proficiency in English, non-native English speakers should have required IELTS/TOEFL score
c) Knowledge in magnetism/ nano-magnetic materials, and some experience in simulation/magnetic measurements such as in MuMax3/SQUID/ VSM / TRMOKE

Preferable: Candidates will be given preference having one or more of the following experiences;
a) Deep Knowledge in magnetism/nanomagnetism and expertise in preparation and characterization particularly in static and dynamic magnetic measurements such as in SQUID (dc & ac mode), VSM etc and their analysis, complex permeability spectra measurement and their analysis.
b) Experience with micro-fabrication (lithographic) to produce micro-patterned structures & their characterization would be desirable
c) Micromagnetic simulation (using MuMax3, COMSOL) of nanomagnetic patterns
d) Ability to write the project reports, articles in journals/conference proceedings

Candidates should submit a brief statement outlining their motivation/suitability for the position and their curriculum vitae, to include list of publications, the names, addresses and email IDs of three referees to Professor Saibal.Roy at email: saibal.roy@tyndall.ie.