Research Fellow (Advanced Polarization Engineering for Nanoscale Bioparticle Analytics)
Nanyang Technological University

Job Title	Research Fellow (Advanced Polarization Engineering for Nanoscale Bioparticle Analytics)
Department	IDMxS https://www.idmxs.org/
Institution	Nanyang Technological University Singapore, Singapore, Singapore
Date Posted	Jan. 23, 2024
Application Deadline	Feb. 28, 2024
Position Start Date	Available immediately
Job Categories	Post-Doc
Academic Field(s)	Biology - General
Job Website	https://ntu.wd3.myworkdayjobs.com/en-US/Careers/job/Research-Fellow--Advanced-Polarization-Engineering-for-Nanoscale-Bioparticle-Analytics-_R00015890
Apply Online Here	https://ntu.wd3.myworkdayjobs.com/en-US/Careers/job/Research-Fellow--Advanced-Polarization-Engineering-for-Nanoscale-Bioparticle-Analytics-_R00015890
Apply By Email	

Job Description

Research Fellow (Advanced Polarization Engineering for Nanoscale Bioparticle Analytics)
Nanyang Technological University

The Institute for Digital Molecular Analytics and Science (IDMxS) invites applications for the position of Research Fellow.

Polarisation variations in a focused beam are not restricted by the traditional diffraction limit and superoscillatory, i.e. very high spatial frequency, variations are possible. Engineering of focused polarisation structures can be achieved, for example, through wavefront shaping and polarisation control of incident beams. Illumination of proteins or other small bioparticles with such superoscillatory polarisation structured light offers opportunities in detection of conformational changes or nano-displacements which can observed with high sensitivity in polarisation space, even though there is no observable variation in the intensity domain. In this project we seek to determine optimal polarisation structures and determine expected sensitivity through analytic and computational means. Viability of experimental detection will be assessed and potentially pursued.

Key Responsibilities:

- Analytically and computationally model polarisation structure of focused light.
- Rigorously model electromagnetic scattering from complex proteins and bioparticles/molecules
- Optimise proposed scheme to enhance sensitivity to particle displacements and conformational variations
- Establish quantitative particle analysis techniques exploiting polarisation engineering
- Assess experimental feasibility and establish tolerance limits
- Build experimental setup and perform associated experiments for detection of nanodisplacements and conformational changes
- Disseminate results through publication in top-tier journals and conference presentations
-

Research Fellow (Advanced Polarization Engineering for Nanoscale Bioparticle Analytics)
Nanyang Technological University

Contribute to research administration and assist in grant writing as required

- Supervise PhD and undergraduate student projects as required

Job Requirements:

- PhD Degree in Physics/Engineering or related disciplines
- Active and strong theoretical and experimental knowledge of optical polarization, single particle dynamics and detection
- Experience in optical beam engineering and wavefront shaping
- Knowledge of optical scattering and biomolecular kinetics would be helpful
- Good writing and communication skills

We regret that only shortlisted candidates will be notified.

EEO/AA Policy

IDMxS is a new, unique interdisciplinary Research Centre of Excellence (RCE), funded by Ministry of Education (Singapore), Nanyang Technological University and National University of Singapore. Hosted by NTU in partnership with NUS, IDMxS is the world's first organized effort focused on interfacing the biological and living world with the world of information technology and data science whilst providing fundamental scientific development, grounded in materials science, optics, and interfacial chemistry.

Research Fellow (Advanced Polarization Engineering for Nanoscale Bioparticle Analytics)
Nanyang Technological University

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact Subathra Devi
Institute for Digital Molecular Analytics and Science
Nanyang Technological University
Singapore, Singapore
Singapore

Contact E-mail subathra.devi@ntu.edu.sg