

**Research Fellow (Physical Sciences/STEM)
Nanyang Technological University**

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Posted Jul. 29, 2024, set to expire May 6, 2025

Job Title	Research Fellow (Physical Sciences/STEM)
Department	School of Physical and Mathematical Sciences
Institution	Nanyang Technological University Singapore, , Singapore
Date Posted	Jul. 29, 2024
Application Deadline	Open until filled
Position Start Date	Available Immediately
Job Categories	Professional Staff
Academic Field(s)	Physics - General Sciences - General
Job Website	https://ntu.wd3.myworkdayjobs.com/en-US/Careers/details/Research-Fellow--Physical-Sciences-STEM-_R00017956

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Job Description

The School of Physical and Mathematical Sciences (SPMS) of NTU is an exciting environment for research. The [Yong research group](#) works on novel problems in biological and statistical physics, ranging from morphological transitions, forms and shapes of things in nature, Monte Carlo simulations, molecular dynamics simulations, stochastic processes, complex networks, etc. Our approach is interdisciplinary, using a confluence of ideas from statistical physics, non-equilibrium physics, differential geometry, topology, elasticity, continuum mechanics, artificial intelligence, to algebraic topology. The PI, Yong Ee Hou, has published many high impact papers on biophysics and related topics, including Science, PNAS, and Phys. Rev. Lett., to name a few.

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Understanding the structure-function relationships of biomolecules is an active area of research due to its fundamental importance in biology, physics, and engineering. Our project will seek to answer fundamental questions such as “what is the shape of a biopolymer?”, “why is a biopolymer shaped the way it is?”, “how is structure related to function?”, and provide new perspectives into the geometry and topology of a biopolymer. The results from the research will provide key insights to understanding the structure-function relationships of biomolecules.

The Yong research group is looking for a highly motivated and qualified Research Fellow with the ambition of producing high quality research that can be published in high impact journals.

The Research Fellow is expected to perform state of the art numerical simulations using computing resources from National Supercomputing Centre (NSCC) Singapore. The incumbent has freedom to design the nature and type of MC/MD simulations.

Key Responsibilities:

- Utilize recently developed mathematical tools from algebraic topology, combinatorial topology, computational topology, and differential geometry (e.g., Betti numbers, Hodge-Laplacian, discrete Ricci curvature) to characterize and model the shape of biopolymers such as DNA and RNA.
- Develop new simplicial models of biopolymers encoded with molecular and structural information amenable to Monte Carlo (MC) and Molecular Dynamics (MD) simulations.
- Run numerical simulations on National Supercomputing Centre (NSCC) Singapore.

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Job Requirements:

- PhD from a reputable university, preferably in physical sciences or STEM related field.
- Good publication track record.
- Strong background in biophysics and statistical mechanics as well as prior experience in numerical simulations (in both MC and MD).
- Expertise in numerical simulations, particularly Monte Carlo simulations and molecular dynamics simulations.
- Ability to code and run simulations on supercomputers.
- Ability to think and work independently and have the aspiration to perform high quality research that can be published in high impact journals.

We regret to inform that only shortlisted candidates will be notified.

Contact Information

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

Contact

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Nanyang Technological University
Singapore

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