Research Fellow (Quantum Materials Physics)
Nanyang Technological University

Job Title	Research Fellow (Quantum Materials Physics)
Department	School of Electrical and Electronic Engineering
Institution	Nanyang Technological University Singapore, , Singapore
Date Posted	Dec. 10, 2025
Application Deadline	Open untill filled
Position Start Date	Available Immediately
Job Categories	Research Scientist/Associate
Academic Field(s)	Engineering Physics Electrical and/or Electronics
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Job Description

The School of Electrical and Electronic Engineering is one of the founding Schools of Nanyang Technological University. Built on a culture of excellence, the School is renowned for its high academic standards and research. With over 3,000 undergraduates students and 2,000 graduate students it is one of the largest EEE schools in the world and ranks 4th in the field of Electrical & Electronic Engineering in the 2025 QS World University Rankings by Subjects.

Today, the School has become one of the world’s largest engineering schools that nurtures competent engineers and researchers. Each year, the School graduates over a thousand students who are ready to take on great ambitions and challenges.

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The Belopolski Research Group (QuantumX Labs) is hiring ambitious & creative Research Fellows to explore topological quantum materials. Our group aims to discover new topological quantum phases of matter, explore their physics and apply them to address challenges in electronics, photonics, quantum computing, catalysis and biology. We use molecular beam epitaxy (MBE) to synthesize atomically precise crystals, we integrate them with two-dimensional exfoliated materials, and we characterize them using transport and angle-resolved photoemission spectroscopy (ARPES). We have immediate need for enthusiastic postdocs to synthesize novel quantum anomalous Hall phases by MBE, characterize altermagnets and *p*-wave magnets by ARPES, pursue scalable wafer-scale moiré epitaxy, develop epitaxial superconductors for quantum computing and integrate machine learning for automated high-throughput MBE. We are particularly excited to recruit postdocs with experience in optics, two-dimensional materials and a strong theoretical background. Applicants should have a Ph.D. in quantum physics, electrical engineering or a related field.

Key Responsibilities:

The Research Fellow will pursue scientific research broadly on topological quantum materials at QuantumX Labs, the research group of Prof. Ilya Belopolski, https://www.quantumx.science. Researchers will have the opportunity to,

- Synthesize atomically precise thin films of new topological materials using molecular beam epitaxy (MBE)
- Develop innovative approaches to accelerate MBE materials development using *in situ* characterization & machine learning
- Integrate epitaxial synthesis with exfoliated two-dimensional materials & devices
- Characterize resistivity, Hall response, non-linear transport and magnetization
- Explore electronic structure with angle-resolved photoemission spectroscopy (ARPES) at synchrotrons such as Diamond Light Source in the UK or the Advanced Light Source in the USA
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Develop theoretical models of topological materials to understand & interpret experimental data

- Leverage nanofabrication facilities & collaborate with other leading research groups at the School of Electrical and Electronic Engineering (EEE) and the School of Physical & Mathematical Sciences (SPMS) at Nanyang Technological University, Singapore
- Collaborate worldwide to identify new candidate materials, perform *ab initio*calculations and complement our results with additional experimental techniques
- Build out additional in-house experimental capabilities in optics, microwaves and quantum sensing

The researcher is also encouraged to bring in physics & techniques from their Ph.D. which augment or resonate with the interests of our group & the community at NTU.

Job Requirements:

- Ph.D. in quantum physics, electrical engineering or a related discipline; familiarity with superconductivity, magnetic skyrmions, topological insulators, Mott insulators and/or quantum spin liquids
- Technical experience with experimental synthesis, transport & optics techniques, such as:
  - Low-temperature transport & characterization by PPMS, MPMS and/or dilution fridge
  - Second harmonic generation, photoluminescence, Raman spectroscopy & other optical techniques
  - Materials synthesis by molecular beam epitaxy (MBE), pulsed laser deposition (PLD) etc.
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Exfoliation & device fabrication of two-dimensional materials such as graphene & chalcogenides

- Strong theoretical & mathematical background
- Interest in leading scientific breakthroughs, as well as working closely with a team, to deepen our understanding of emergent phenomena in quantum physics and pioneer applications to electronics, photonics, quantum computing, catalysis and biology

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

Singapore