

Postdoctoral Fellowship in Quantum Computing

Location: Muizenberg, Cape Town, South Africa

Start date: 1st of January 2026

The Quantum@AIMS research group, led by [Dr Ryan Sweke](#), is inviting applications for a two year postdoctoral fellowship. Research in this group is focused on foundational mathematical questions at the intersection of quantum computing, theory of machine learning and cryptography, and applicants should ideally have both a background in related topics and strong motivation to perform research in these directions. Example questions of interest include:

Can quantum computers provably offer meaningful advantages for machine learning? If not, can one prove their limitations?

Can one develop provably efficient algorithms for learning about the quantum world – i.e. for learning unknown quantum states and processes?

To what extent can one implement quantum learning algorithms in distributed settings with untrusted parties?

How can quantum cryptography be utilised to provide cryptographic advantages in security and robustness to state-of-the-art ML algorithms and models?

What foundational assumptions are necessary for cryptography — to what extent can one develop quantum cryptography in a world without one-way functions?

The positions are funded by the DAAD, as part of the “AIMS\FU Berlin Quantum Computing Partnership”. As such, while being based primarily at AIMS, the successful applicant will have the opportunity for collaboration with, and annual research visits to, the group of Prof. Dr. Jens Eisert at the Freie Universität Berlin.

Responsibilities and Expectations

- Pursue collaborative research in topics and directions such as the ones listed above and drive the establishment of new collaborations and collaborative research projects.
- Participate actively in the co-supervision and mentorship of MSc and PhD students.
- Participate actively in the organization of workshops and conferences at AIMS.
- Undertake annual research visits to the group of Prof. Dr. Jens Eisert at the Freie Universität Berlin (up to three months per year).

In light of the above, candidates should have a strong desire to participate actively in a collaborative, open and encouraging group environment.

AIMS South Africa Council

David Holgate (Chair, University of the Western Cape), Daya Reddy (University of Cape Town), Grae Worster (University of Cambridge), Kerstin Jordaan (University of South Africa), Mike Giles (University of Oxford), Neil Turok (University of Edinburgh), Sibusiso Moyo (Stellenbosch University), Thandi Mgwebi (National Research Foundation), Ulrich Paquet (AIMS), Yacine Chitour (Université Paris-Saclay)

Requirements

- Applications should hold a PhD in physics, mathematics or computer science by the 31st of December 2025.
- A strong mathematical background, with a desire and ability to perform mathematical research in quantum computing on topics related to those listed above.

Compensation and Benefits

- Monthly stipend of €2300 per month while in South Africa (paid in South African Rands based on monthly exchange rate).
- Monthly stipend of €2000 per month while in Germany.
- Health Insurance.
- Flights to and from AIMS at the beginning and end of position.

Applying

To apply please email the below documents, in four separate pdf files, to rsweke@aims.ac.za, with the subject line "Postdoctoral fellowship application":

1. **Full CV** including a list of publications, talks and contact details of at least two references.
2. **Statement of motivation and research interests** (max 3 pages) detailing your research interests and motivation to perform research in quantum computing, focusing on questions at the interface of quantum computing, learning theory and cryptography. Why does this research excite you?
3. **Proof of PhD completion**, or proof of graduation by 31st December 2025. If you have already completed your PhD please also include a copy of your thesis here.
4. **All available academic transcripts** (compiled into one pdf).

There is no deadline for applications, and the positions will be filled when suitable candidates are found.

AIMS is a vibrant inter-disciplinary and immersive pan-African research environment, and applicants should be enthusiastic to be present and contribute actively to the research environment at AIMS. Applications will be accepted from anywhere in the world, and applications from Africa and groups under-represented in the mathematical sciences are strongly encouraged



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