Postdoctoral position in grid-based quantum chemistry on quantum computing devices

August 21, 2024

The QuNB quantum chemistry group of Stijn De Baerdemacker at UNB and Theory and Computation group of Michael Schuurman at NRC/uOttawa have a two-year postdoctoral position available on *grid-based quantum chemistry on quantum computing devices* starting Fall 2024. The project is supported by the Applied Quantum Computing Challenge program of NRC, in alignment with Canada's National Quantum Strategy.

Quantum computing is an emerging technology with the potential to disrupt scientific computing, including quantum and computational chemistry. The scope of this project is the theoretical development of a novel grid-based formalism for solving the time-independent and time-dependent Schrödinger equation of chemistry on digital quantum devices.

The present position offers opportunities to perform theoretical work on the design of quantum computing algorithms for quantum chemistry. Interested candidates hold a PhD in theoretical chemistry or closely related field. Experience with orbital-based quantum computing approaches and quantum circuit design for quantum chemistry are an asset.

This unionized position is guaranteed for two successive years at CAD60k/year[1], plus benefits. The first year will be hosted by QuNB, whereas the second year will be hosted by the Theory and Computation group, with high mobility between the two collaborative research groups. The successful candidate will receive opportunities to develop leadership skills, such as the supervising of undergraduate and graduate students, during the project. Interested applicants are requested to provide

- a motivated cover letter, including a short statement of research interests.
- a CV, including a list of publications,
- the e-mail address of a minimum of 2 references.
- formal confirmation of the PhD degree.

to both stijn.debaerdemacker@unb.ca and michael.schuurman@uottawa.ca. Review of applications will commence on September 6, 2024 and continue until the position is filled. Starting date and working conditions are open for negotiation.

[1] with a 2% inflation correction in the second year

Housed in the Department of Chemistry at UNB, the QuNB group is led by Canada Research Chair in Theoretical Chemistry Stijn De Baerdemacker, and performs fundamental research in quantum chemistry, machine learning and quantum computing. Established in 1785 on unsurrendered and unceded Wolastoqey land, UNB is one of North America's oldest public universities. Nestled in the Canadian maritime province of New Brunswick, UNB is located in the quaint and beautifully vibrant city of Fredericton, known for its surrounding natural beauty as it is for its lively arts and musical experiences.

Research in the Theory and Computation group at the NRC, led by Michael Schuurman, spans multiple areas of atomic, molecular, and optical (AMO) physics. This includes the development of electronic structure methods and their software implementation, the simulation of ultrafast processes, as well as application and development of approaches for molecular quantum dynamics. Research in the Theory and Computation group is characterized by close collaboration with experimental colleagues, both within the NRC and internationally. The Theory and Computation group is based at 100 Sussex Drive and located in the national capital of Ottawa, Ontario.

Both the QuNB and Theory and Computation Group are dedicated to Equity, Diversity and Inclusion. Candidates who self-identify as belonging to under-represented groups are strongly encouraged to apply. For questions about the position, please contact stijn.debaerdemacker@unb.ca or michael.schuurman@uottawa.ca.