Graduate Student Position(s) in Winnipeg, MB, Canada

I am looking for one or more qualified graduate student (M.Sc. or Ph.D. level) to join my research group, *subject to the confirmation of funding*.

Background:
An applicant must have – or be close to receiving – a B.Sc., M.Sc. or equivalent in chemistry or physics or a closely related field. A good knowledge of, and a strong interest in, computational chemistry and/ or inorganic and materials chemistry are essential. Proof of English language proficiency is required. Programming experience is essential for the second project.

Research projects:
The following projects are of particular interest.

(1) "Theoretical actinide molecular science". This area is a long-standing interest of my group. The specific project will involve close collaboration with the Helmholtz-Zentrum Dresden-Rossendorf in Germany (HZDR, http://www.hzdr.de/). A student working on this project is expected to regularly visit our collaborators at the HZDR and to spend part of the time there.

(2) "Program development within the ADF-BAND environment". Programming experience or experience with quantum-chemical program systems are required for this project. Knowledge of topics such as ADF, ADF-BAND, band-structure codes *etc*. are assets. For this project, students with a degree in physics and relevant experience and background (e.g. in band-structure methods) are also encouraged to apply.

In addition to these two areas, the following topics are of interest as well.

(3) "Polymer modeling". Modeling of conducting polymers, with a view of applications in novel memory devices or solar energy conversion.

(4) "2D materials". These are graphene and its analogues; they are modeled with a view of band structure engineering, devices, etc.

(5) "Solar energy". We are using the tools of computational quantum chemistry to understand elementary chemical processes within dye-sensitized solar cells (DSSC) and to study singlet-fission materials.

(6) "Environmental mercury chemistry". Computational study of mercury complexes, with a focus on environmental chemistry. Future directions might include gas-phase (atmospheric) chemistry or dynamics studies of mercury solvation.

(7) Other projects as initiated by the student are possible in principle.

These specific projects are embedded into the general research program of my group. (See my homepage for further details.)

Application:
Interested candidates should contact me directly by E-mail, and provide ***all*** *of the following material*:

- Cover letter;
- A detailed CV including list of publications (if any);
- Detailed lists of courses and grades or preferably scanned (unofficial) copies of transcripts;
- Names and E-mail addresses of two or more potential referees;
- Document outlining in detail which of the project(s) are of particular interest to you and why (approximately 1–2 pages).

In addition, please provide the following information in your CV, cover letter or in separate documents:

- Comment on your English proficiency (e.g. TOEFL, IELTS, or native speaker);

- Comment specifically on your background in relevant areas such as quantum mechanics, programming, inorganic chemistry, materials chemistry, physics, mathematics;
- Please mention where you found this advertisement;
- Comment on the preferred start date. Potential start dates are May 1, July 1 or Sept. 1, 2016. Non-Canadian applicants should keep in mind that visa processes take considerable time. (This would make the May start date unlikely.)

Application process:
The review of the applications will begin after November 15, 2015 and will continue until the position(s) are filled. I expect to create a shortlist by mid December. At this point, shortlisted candidates will be invited to submit a formal application. Admission into our graduate program is the *joint responsibility* of the Department of Chemistry and the Faculty of Graduate Studies at the University of Manitoba, see: http://www.umanitoba.ca/faculties/graduate_studies/

After successful admission, candidates will receive an official admission letter that will allow them to apply for Canadian visa if required.

Research group:
The research of my group is focused on developing density functional theory (DFT) based methods and applying them to study molecules and their properties. For more details, please contact me directly or refer to my web pages at: http://home.cc.umanitoba.ca/~schrecke/

Environment:
My research group is part of the Department of Chemistry at the University of Manitoba in Winnipeg. The University of Manitoba (http://www.umanitoba.ca/) is the largest university in the province of Manitoba and among Canada's major research universities. It has an undergraduate student population of about 25,000, and about 4,000 graduate students. The Chemistry Department (http://www.umanitoba.ca/chemistry/) is one of the largest departments in the University of Manitoba, yet it keeps a friendly and collaborative atmosphere. Recently, the department has undergone a period of renewal and growth.

Winnipeg (http://www.winnipeg.ca/) is a prairie city with a population of approximately 730,000 (metro area). Its people come from various ethnic backgrounds, and are generally friendly and welcoming. Cultural amenities include ballet, theatre, symphony, ethnic festivals, and museums, and professional sports teams are popular. Winnipeg is a safe city. It is located close to good outdoor recreational activities with a wide variety of lakes, beaches and wilderness areas within an easy drive of the city.

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