

RESEARCH ENGINEER – ULTRA HIGH VACUUM (UHV)

STEWART BLUSSON QUANTUM MATTER INSTITUTE

UNIVERSITY OF BRITISH COLUMBIA

The Stewart Blusson Quantum Matter Institute at UBC (SBQMI) is a world-leading venture into research of systems and phenomena explicitly involving quantum mechanics. One of its core areas of strength is research into various condensed matter systems which employ sophisticated Ultra High Vacuum (UHV) systems.

Under the direction of the Principle Investigator(s) working with UHV instrumentation, the Research Engineer, UHV will take the lead in designing, constructing and maintaining UHV equipment and infrastructure required to conduct experiments in Scanning Tunneling Microscopy (STM), Angle Resolved Photoemission Spectroscopy (ARPES), Topological Quantum Devices, study of the Heat Trap effect in one-dimensional conductors, and any other research projects that may arise involving UHV infrastructure. This includes working with the Principle Investigators and other researchers to frame problems and the approach to their resolution, designing, constructing and maintaining the optimal equipment and techniques to explore and find answers to these, and mentoring SBQMI students and other researchers. The Research Engineer will collaborate with other national and international academic institutions, government, and industry organizations, attend conferences and workshops to gather and disseminate knowledge of advances in the field and will participate in writing and submissions of grants to fund research activities and required infrastructure.

ORGANIZATIONAL STATUS

The Research Engineer, UHV reports to the Operations Manager and provides support to other SBQMI Principle Investigators and Researchers as requested. The Research Engineer makes decisions regarding design, construction and maintenance of research equipment, plans and oversees the construction of complex research equipment, and provides mentoring and coaching to students and other researchers.

WORK PERFORMED

Research

- Design and construct UHV vacuum systems using Computer Aided Design (CAD) software, for example, Solidworks, AutoCAD, Autodesk Inventor. Understand researchers' projects and conduct research to discover how to create the necessary systems;
- Optimization and upkeep of existing fully functioning UHV systems - replacing turbo pumps upon failure; replacing roughing pumps, replacing feedthroughs and other actuators, leak detection of equipment as required. Logging of vacuum related data (pressure, temperature, outgassing rates) to fully characterize each UHV system; ultrasonic cleaning of parts; other maintenance as required;
- Careful bakeout of UHV systems; maintenance of bakeout equipment; remote monitoring of bakeout temperatures and logging such data;
- Record details of construction projects with careful attention to detail in keeping track of drawings and related revisions; prepare official reports and statistics to support SBQMI and UBC performance related metrics and other university related administrative requirements;

- Work closely with vendors in obtaining equipment quotes for various projects;
- Identify research opportunities into new equipment that will allow researchers to broaden the scope of their work; prepare and write proposals to rationalize allocation of funds to the project;
- Research and develop new experimental design techniques that will increase and maintain scientific excellence; prepare reports on these, and other, research activities;
- Work closely with equipment suppliers, engineers and other contractors, as required.

Facilities Operation

- Ensure that maintenance plans are in place and implemented for all equipment related to SBQMI's UHV infrastructure; working with suppliers and contractors when necessary;
- Keep detailed maintenance records for various systems;
- Establish operational guidelines for various systems.

Fostering Learning

- Provide engineering advice and mentoring to students and other researchers related to vacuum systems as required;
- Prepare and present UHV/HV related workshops for SBQMI members as required;
- Attend tradeshow and other technical events; visit experts, or host visitors, who can further the knowledge and research activities of SBQMI, including from academia, industry and government agencies.

QUALIFICATIONS

Undergraduate degree in Engineering or Applied Science. A degree in Physics, Chemistry or similar discipline would also be suitable. Minimum of one year experience or the equivalent combination of education and experience. Experience working in a research and/or research and development environment preferred.

- Demonstrated ability to develop instrumentation that will assist in the resolution of a particular experimental question or problem related to condensed matter systems employing sophisticated Ultra High Vacuum systems;
- In-depth knowledge of appropriate UHV materials;
- Computer skills, including use of office suites and web apps;
- Proven awareness of safe work practices;
- Demonstrated ability to creatively solve engineering problems.

Please apply online at www.staffcareers.ubc.ca/27514

Salary range is \$47,338.00 (minimum) - \$68,192.00 annually. UBC offers a competitive benefits package including extended medical, dental, life insurance, professional development funding and pension.

Equity and diversity are essential to academic excellence. An open and diverse community fosters the inclusion of voices that have been underrepresented or discouraged. We encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Metis, Inuit, or Indigenous person. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.