Job Posting

Job ID:	28728
Location:	Vancouver - Point Grey Campus
Employment Group:	Management&Professional (AAPS)
Job Category:	Scientific Engineering
Classification Title:	Scientific Eng., Level C
Business Title:	Electron-Beam Lithography & Process Engineer
Department:	Quantum Matter Institute
Salary:	$64,402.00 - $92,778.00 (Annual)
Full/Part Time:	Full-Time
Desired Start Date:	2018/04/16
Job End Date:	2022/08/31
Funding Type:	Grant Funded

Closing Date: 2018/02/17 **Available Openings:** 1

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Guiding principle: "Midpoint" of the hiring salary range means the individual possesses full job knowledge, qualifications and experience.

Job Summary

The Stewart Blusson Quantum Matter Institute at UBC (SBQMI) is a world-leading venture advancing research into solid state systems and phenomena that explicitly involve quantum mechanics. Among its core areas of expertise are the development of materials hosting novel quantum electronic states, and measurement of nanoscale electronic structures built from these materials, whose device characteristics display remarkable new paradigms of operation.

SBQMI has invested heavily on acquiring a state-of-the-art electron-beam lithography tool that enables device fabrication at the nanoscale, where quantum properties of materials manifest themselves. The Electron-Beam Lithography & Process Engineer is the dedicated engineer responsible for fully exploiting the capabilities of this lithography tool. To this end, the post holder, who should already have experience in electron-beam lithography, micro/nano-fabrication, and process development, plans, designs and delivers complete micro/nano-fabrication engineering solutions, for a number of different stakeholders, and working on various projects.

The individual is expected to work independently, with a proactive and creative spirit and in close collaboration with colleagues, in order to be able to deliver what is required of the role.

The post holder also has a duty to ensure that all tasks conducted within SBQMI labs are performed in a safe manner that conforms to current legislation and work place protocols.

Organizational Status

The Electron-Beam Lithography & Process Engineer reports to the Director, Nanofabrication Facilities. The post holder will work independently and pro-actively, and will be often required to use the SBQMI cleanroom and to collaborate closely with the Research Associate, Microfabrication.

Work Performed

The Electron-Beam Lithography & Process Engineer will be involved in leading a number of projects simultaneously with respect to their micro- and nano-engineering aspects. The Engineer will define requirements for materials and processes used in the fabrication of micro/nano-structured devices; produce specifications and other documents to manage the development of devices and processes; and develop and qualify new processes to meet requirements. The Engineer will also conduct analyses to determine reasons for failures of materials, devices or processes, implementing corrective and preventive actions.

The following items reflect the most important tasks associated with the post. The list is not complete and may change as the role evolves with time. The Electron-Beam Lithography and Process Engineer:
1. Plans, designs, develops and delivers innovative process specifications for the realization of micro- and nano-structured devices, using techniques that include, but are not limited to, electron-beam lithography, photolithography, wet and dry etching, physical and chemical vapour deposition, electro-forming, soft lithography, and metrology.
2. Working on a number of different projects, develops innovative technologies for micro/nano-structured devices and transfers such technologies to a diverse user community that includes internal and external stakeholders and industrial partners.
3. Advises on the design and feasibility of micro/nano-engineering aspects of various research projects for a wide range of internal and external stakeholders.
4. Designs and develops novel capabilities of existing and new nano/micro-fabrication equipment, designs and develops experiments, and finds solutions to complex engineering problems.
5. Monitors the performance of processes that make use of the electron-beam lithography tool and engineers all necessary interventions, ensuring that these processes remain operational and perform to specifications.
6. Is the main person responsible for SBQMI's electron-beam lithography tool, regarding all aspects of its operation, including user training and liaising with users, with the aim of delivering consistency and reliability.
7. Offers time, skills and expertise to other SBQMI labs and projects, as instructed by the Director, Nanofabrication Facilities, and performs other relevant to the job tasks, as required.

Supervision Received

Works independently. Reports to Director, Nanofabrication Facilities, who determines the broad direction and operational requirements of the role, and who may also offer training and guidance.

Supervision Given

Provides advice to faculty, staff, postdocs, graduate students and other facility users on the proper and safe use of the electron-beam lithography tool and the associated processes, and oversees their activities within the electron-beam lithography lab. Supervises, guides and instructs the cleanroom technician, as required.

Consequence of Error/Judgement

Errors in judgement, mishandling of tools and neglect in following standard procedures could lead to the reduction of service available to the Institute affiliated UBC research groups and external users, cause damage to expensive equipment and endanger the health and safety of the post holder, other lab users and those in the vicinity. The position is central to the operation and delivery of services in SBQMI's electron-beam lithography facility. Poor performance or errors in judgement may impact timely provision of services required by research, in particular students, who are working to strict timelines, and other internal and external users, including from industry and government. Issues with data quality could impact those stakeholders as well as the reputation of the facility and the University. Errors in performing the responsibilities of this position could also lead to unsafe laboratory conditions, which may jeopardize the safety of facility users and the role holder. Poor decisions could cause financial loss to the Institute

via failure to collect money owing for use of facilities and exposure to liability or damage to equipment or facilities.

Qualifications

Undergraduate degree in Engineering or Applied Science. An undergraduate degree in Physics, Chemistry or another relevant discipline would also be suitable. Master's or PhD degree in Engineering, Physics, Chemistry or other relevant discipline is preferred. A minimum of 5 years of experience or the equivalent combination of education and experience. Essential qualifications:
- Computer skills, including mask layout and CAD-related software
- Experience in a research and/or research & development setting, involving micro and nanofabrication process development
- Previous working knowledge and experience in operating an electron-beam lithography system, as evidenced by a portfolio of fabricated devices
- Proven working knowledge and hands-on experience in a range of other micro/nano-fabrication techniques, including but not limited to: photolithography, resist processing, wet and dry etching, physical and chemical vapour deposition, electroforming, bonding, and micromachining
- Proven working knowledge of analysis techniques, including but not limited to: scanning electron microscopy, scanning probe microscopy, and contact profilometry
- Proven awareness of safe work practices
- Demonstrated ability to creatively solve engineering problems
- Lab instrumentation/equipment fault finding and fault diagnosis skills
- Demonstrated team work qualities

Desirable qualifications:
- Knowledge of and experience in Linux-based operating systems and computer programming
- Published research involving micro and nanofabrication
- Knowledge of and experience in vacuum systems
- Knowledge of high-end lithography software
- Knowledge of software-hardware interface technologies

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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.

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