

Research Engineer
Micro and Nanotechnology Laboratory
College of Engineering
University of Illinois at Urbana-Champaign

The Micro and Nanotechnology Laboratory at the College of Engineering seeks applicants for the position of Research Engineer. Reporting to the Principal Research Engineer, this person will facilitate research efforts being conducted in a cleanroom laboratory environment and to provide support and direction to laboratory users and co-workers including: managing equipment and tools involving hands-on equipment maintenance of the chemical vapor deposition systems and other equipment as assigned, conducting day to day growth runs grown to customer specifications and training of new users as required. Information about the Micro and Nanotechnology Laboratory can be found here: <http://mntl.illinois.edu/>.

Specific duties and responsibilities include:

- Maintain and repair various processing tools operated within the Micro and Nanotechnology Laboratory (MNTL) cleanroom laboratories. Primarily responsible for, but not limited to, systems such as metal-organic chemical vapor deposition (MOCVD) reactors for III-V compound semiconductors, low-pressure chemical vapor deposition (LPCVD), plasma-enhanced chemical vapor deposition (PECVD), CVD furnaces for Carbon Nano-Tubes (CNTs), graphene, and TMDCs; with MOCVD being the top priority.
- Provide equipment operation training and instruction sets for users of the above systems.
- Develop, characterize, and document processes that utilize the above-mentioned equipment.
- Work with faculty, other staff, and researchers to develop new processes for new compound semiconductor-based substrate hetero-structures fundamental in the fabrication of compound semiconductor devices.
- Consult, assist, and perform tasks as required by any contracted foundry work. In particular, the Aixtron MOCVD reactor will be a primary responsibility for the Research Engineer to operate and maintain in the context of a facility that will be available to external users for epitaxial layer process development. Responsibilities will include generation of cost data (materials, supplies, personnel time) to enable generation of price quotes and invoices to customers of the reactor. Develop policies for usage, training, preventive maintenance, and process control to assure that fabrication process tools are operating within specifications.
- Gather and interpret statistical process control data for fabrication equipment and metrology tools for monitoring and maintaining the process and equipment to keep them functioning at high equipment uptime and to high standards of material specifications.

- Prepare and deliver training to MNTL users on topics within area of expertise, which may include CVD process development, CVD system care and maintenance, statistical process control, and safety.
- Continuously maintain training and certification for SCBA, so as to be able to perform scheduled maintenance, emergency response, and tank changes for toxic gasses.
- Assure certification of MNTL's SCBA equipment, and maintain records of SCBA certification (including annual medical clearance) for all SCBA-certified personnel at MNTL.
- Working with a group of PhD candidates, research staff and Faculty, develop reproducible, high quality semiconductor hetero-structures for project and product device fabrication by participating in the specification, costing, and installation of new fabrication process systems.
- Contribute as a team member for rapid response to process tools that do not function as required, serving in a lead role for CVD-related equipment, and in a supporting role for other equipment.
- Assume additional appropriate related research duties to further the mission of the laboratory.

Minimum Qualifications:

- Bachelor's degree in Engineering or related field.
- Five years of experience as an engineer working in a cleanroom laboratory environment responsibility for the maintenance, repair, and operation of a MOCVD reactor system for epitaxial growth of compound semiconductors.
- Five years of experience beyond PhD or postdoctoral research working with MOCVD systems and associated fabrication processes, including deep familiarity with the safety precautions for the installation, operation, and maintenance of MOCVD systems that utilize toxic gas (arsine, phosphine) and explosive gas (hydrogen, silane, dichlorosilane).
- Good understanding of electrical and mechanical schematics. Proficiency at diagnosing and repairing electromechanical systems and instrumentation. Functional knowledge of semiconductor device principles for p-n junctions, quantum wells, photodetectors, and light emitting diodes. Excellent oral and written communication skills.

Preferred Qualifications:

- Advanced degree (MS or PhD) in Electrical and Computer Engineering or Material Science.
- Experience with metrology techniques that include x-ray diffraction, atomic force microscopy, photoluminescence, and Hall effect measurements.
- Experience in an Industrial environment or national laboratory with MOCVD epitaxial growth of compound semiconductors.
- Familiarity with approaches used for substrate preparation, reactor chamber cleaning, in situ process monitoring for chemical vapor deposition of semiconductor epitaxial layers.

- Comprehensive understanding of vacuum systems, mass flow controllers, exhaust treatment, and leak detection methods as they pertain to chemical vapor deposition reactors.
- Knowledgeable about emerging trends in epitaxial semiconductor materials and devices, including those based upon nitrides, antimonides, and two-dimensional materials.

The Research Engineer position is a full-time, benefits-eligible academic professional position appointed on a 12-month service basis. The expected start date is as soon as possible after the closing date. Applicants may be interviewed before the closing date; however, no hiring decision will be made until after that date. Salary is commensurate with experience and qualifications.

To apply for this position, please create your candidate profile at <http://jobs.illinois.edu> and upload your cover letter, resume, and names/contact information for three references by June 30, 2016. Full consideration will be given to complete applications received by the closing date. For further information regarding application procedures, contact Leslie Lewin Reinhart, lewin@illinois.edu, 217-300-3872.

The University of Illinois conducts criminal background checks on all job candidates upon acceptance of a contingent offer.

Illinois is an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, religion, color, national origin, sex, sexual orientation, gender identity, age, status as a protected veteran, status as a qualified individual with a disability, or criminal conviction history. Illinois welcomes individuals with diverse backgrounds, experiences, and ideas who embrace and value diversity and inclusivity. (www.inclusiveillinois.illinois.edu).