Microfluidic Silicon Processing

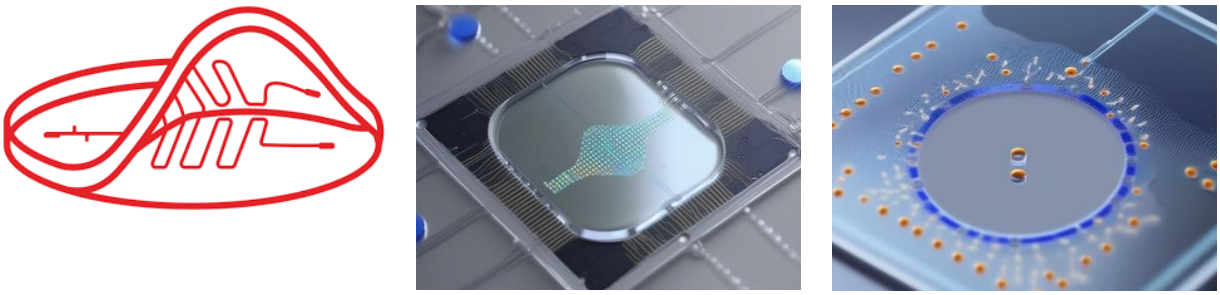
Laboratory Name: Stoeber Lab
Faculty Supervisors: Profs. Boris Stoeber and Christoph Sielmann

General Area of Research

Microfluidics, silicon processing

The Project

The most significant recent advances in microelectromechanical systems (MEMS) were enabled by surface micromachining, where thin films of materials are sequentially deposited on a substrate and patterned through etching processes. This processing sequence led to the micromachined mechanical structures of mass-produced accelerometers, gyroscopes, digital light processing devices, and microphones, to name just a few. Recent advances in silicon electrochemistry have demonstrated that micropatterning of silicon thin films using a room temperature, wet process may be achievable. This project represents an initial investigation to assess feasibility of silicon micropatterning and doping using microfluidics with some imagined examples shown in Fig. 1. The work involves a literature review of existing work in room temperature silicon electrochemistry with a report focusing on methods compatible with microfluidic processes. Ideally, time permitting, some preliminary lab work will experimentally support the claims made in the report.



a) b) c)

Figure 1: Imagined examples of silicon processing based on microfluidics; a) removal of a temporary microchannel after a processing step; image credit: Boston Micro Fabrication (BMF); b) microfluidic droplets on a silicon wafer for silicon processing; c) silicon processing through deposited droplets.

Facilities and team

Prof. Stoeber's team has equipment for microfluidics flow control and access to equipment to create custom microfluidic devices. Contact: boris.stoeber@ubc.ca