PhD Openings in the Labram Group at Oregon State University

The Labram Group in the School of Electrical Engineering and Computer Science (EECS) at Oregon State University is looking to hire two full-time PhD students starting September 2020. You will be fully-funded by the Labram Group, and will work on experimental projects in the development of next-generation flexible electronics. Candidates must have received an undergraduate degree in electrical engineering, materials science, physics, chemistry, or a related discipline by 21st September 2020.

The application deadline for Oregon State University is 15th December 2019, but pre-screening of candidates will take place before this date. Interested candidates should email a full CV / resume to John Labram at: john.labram@oregonstate.edu, by 15th November 2019. Professor Labram will inform candidates by 30th November 2019, whether he will support their application. Informal inquiries can be made via the same email address.

Oregon State University is located in Corvallis, in the beautiful Pacific-Northwest of the United States. Further information can be found below:

- The Labram Group: http://web.engr.oregonstate.edu/~labramj/
- Oregon State University: http://oregonstate.edu/
- Information about Corvallis: https://visitcorvallis.com/

Project 1: High-Performance Optical Sensor Circuits Based on Metal-Halide Perovskites

Metal halide perovskites are a class of materials possessing opto-electronic properties which are, by many metrics, remarkable. Despite being extensively studied for only 10 years, and processed from solution at low-temperature, solar cells based on these compounds have already exhibited power-conversion efficiencies in excess of polycrystalline silicon (the commercial standard). Yet despite their amazing electrical properties, they have been scarcely studied for electronics applications.

In this project you will develop thin-film transistors from these compounds, with the goal of creating circuits capable of processing information based on optical signals, as well as electrical signals. The superb absorption- and charge-transport-properties of these compounds suggest they are excellent contenders for commercial applications. The field of hybrid halide perovskites is a young, but fast-moving field, where you will have the opportunity to generate high-impact work.

Project 2: Quantum Devices Based on Disordered Metal Oxide Semiconductors

Low-cost, large-area, semiconductors represent a bold vision of the future in which electronics is omnipresent. This vision includes conformal, stretchable, transparent and bio-compatible electronics embedded into our natural surroundings, present whenever needed and enabled by simple and effortless interactions. If one were able to print circuits, at a comparable cost to printing a newspaper, then it is conceivable that transforming normal objects into smart-objects would be as routine as affixing a sticker.

In this project you will be developing devices based on ultra-thin (<10nm) layers of disordered metal oxide semiconductors. Despite traveling in disordered systems, charge carriers in metal oxide semiconductors have been shown to possess quantized energy states when confined to 2-dimensions. By studying and exploiting this phenomenon, you will be developing new and novel electronic devices, with a range of previously unobserved capabilities.