

Creating Interdepartmental Imaging Center Circle

Our circle was organized to champion the idea of creating an interdepartmental Imaging Center.

The Imaging Center would require an adequate space and the following equipment to start:

1. Scanning Electron Microscope (SEM)
2. Energy Dispersive X-Ray Spectrometer (EDX)
3. Wavelength Dispersive X-ray spectrometer (WDX)
4. Transmission Electron Microscope (TEM)
5. Confocal Microscope.
6. Standard accessories associated with the above instruments (computer, optical microscope, carbon and gold sputterer, critical point drier, ultramicrotome, liquid nitrogen, polishers, etc)

We believe that creating such a center is important for the following reasons:

- i. If our institution is to become research oriented and attract both researchers and graduate students, it must **first** build an infrastructure, which can support and facilitate scientific research.
- ii. The existence of such a center is essential in any reputable, research oriented scientific institution. It would enhance research in chemistry, physics, biology, earth & environmental science, water quality technology, and in many other areas where the structure and composition of specimens is being researched. Once it is well established, the Imaging Center can also generate revenue for the institution by providing services for hire to local industry. There is already some interest from a company in the Kelowna area. (I.D.ology Labs, #6 1925 Kirschner Rd. Kelowna, BC, V1V 4N7)
- iii. The existence of a modern Imaging Center would allow us to develop an undergraduate/graduate course on electron microscopy/x-ray spectroscopy. The possibility of learning and using the above techniques always attracts many students and increases employability of graduates.

The following faculty from the Faculty of Science have already declared their interest in utilizing the prospective Imaging Center's equipment in their research:

See below the list of potential users with the relevant information about their current and /or potential research that would require the Imaging Center's equipment.

William Bates (biol)

Dr. W. R. Bates: Mechanisms of Genetically Programmed Cell Death (PCD) during Development.

Ongoing NSERC-Funded research on PCD requires continuous use of a TEM and confocal microscope, yet at present I must travel to Summerland and Bamfield Marine Science Centre for this type of analysis. Having to travel several hours to other facilities obviously presents many problems. I have over 20 years experience using SEM and TEM methods in biological research and have published more than 10 papers.

Yuan Chen (eesc)

I have used electron microscope(SEM-WDX) in my research on mineral deposits, including gold and nickel-copper-PGE (platinum group elements) deposits. I have studied the precious metal minerals including their grain size, mineral association, and chemical composition. The SEM-WDX data on precious metal deposits are used in exploration and ore processing. Another field I was involved is the research of weathering processes of ore deposits. The electron microscope(SEM-WDX) is no doubt the essential tool to identify the fine-grained minerals formed in surfacial processes. I have published eight papers with electron microprobe(SEM-WDX) data. I am also interested in study of mine tailings, which definitely needs SEM-WDX works.

Soheil Mahmoud (chem)

My research centers on the metabolism of monoterpenes in higher plants. In most plants, the biosynthesis of these metabolites is localized to specialized tissue such as glandular trichomes, secretory cells and resin ducts. Imaging facilities are essential for studying these structures, for pathway localization, and for reporter gene expression studies. Although I am not currently carrying out such investigations, my research will naturally go in that direction, and benefit from imaging equipment.

Bruce Mathieson (biol)

A confocal microscope would be a major addition to the instruments I use in my research. It will allow high resolution fluorescent imaging of labelled brain neurons and neuronal processes involved in controlling reproduction behaviour. I also need to use TEM to examine the ultrastructure of synaptic connections between these neurons. These studies will expand on my published characterizations of the neurochemistry and genetic determinants of hypothalamic neurons. I've published 3 previous papers using TEM data.

Murray Neuman (phys)

My research interest lies less in the use of imaging facilities than in the development of imaging techniques. As confocal microscopy is still unperfected, it would be interesting to investigate ways of enhancing its resolution, such as two-photon excitation. A working instrument would of course be a useful starting point.

Teresa Wrzesniewski (chem/phys)

My primary research interest is internal structure of pure metals and alloys (dislocation structure, grain boundaries, precipitation phenomena etc) and its correlation with different heat and mechanical treatments of materials. Both a transmission electron

microscope (TEM) and a scanning electron microscope (SEM) with x-ray spectrometers are essential in my studies. Since I started working at OUC I have not been able to continue research due to the lack of any equipment, but I would like very much to restart it at UBCO. I taught electron microscopy and material science at undergraduate / graduate levels and I would like to develop such courses, once the Imaging Center is established.

Also the following faculties intend to use the Imaging Center's facilities to enhance their research.

Dan Durall	biol
Kathleen Jagger	eesc
Melanie Jones	biol
Dan Murray	phys
Blythe Nilson	biol
Karen Perry	chem
Scott Reid	biol

Recommendations:

That a creation of an interdepartmental Imaging Center as outlined above will be placed as a high priority item in the development plans for UBC-O.

University Circle Members:

Patricia Baird	chem
William Bates	biol
Rosemary Capell	chem
Yuan Chen	eesc
Kathleen Jagger	eesc
Soheil Mahmoud	chem
Roberta Massey	chem
Bruce Mathieson	biol
Dan Murray	phys
Blythe Nilson	biol
Teresa Wrzesniewski	chem/phys