

SIMON FRASER UNIVERSITY
Senate Committee on University Priorities
Memorandum

TO: Senate

FROM: John Waterhouse
Chair, SCUP
Vice President, Academic

RE: 4D Labs
(SCUP 05-027)

DATE: April 11, 2005



Attached is the proposal for the establishment of the 4D Labs submitted for consideration by Dr. Ross Hill, Department of Chemistry. This will be a Schedule B Centre reporting to the Vice-President, Research in accordance with Policy R 40.01.

The Senate Committee on University Priorities reviewed the proposal at its March 23, 2005 meeting. With minor edits which have now been incorporated into the document, the proposal was unanimously approved. Once approved by Senate, the proposal will be submitted to the Board of Governors.

Motion:

That Senate approve and recommend to the Board of Governors the establishment of the 4D Labs as a Schedule B Centre under Policy R40.01.

Attach.

- c. M. Pinto
- M. Plischke
- R. Hill
- G. Nicholls

SIMON FRASER UNIVERSITY

OFFICE OF THE VICE-PRESIDENT, RESEARCH

Memorandum

TO: Glynn Nicholls, Secretary
Senate Committee on University
Planning (SCUP)

FROM: B. Mario Pinto
Vice-President, Research

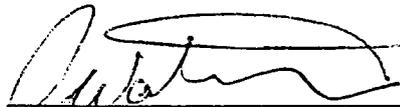
RE: 4D LABS

DATE: March 17, 2005

Attached is a proposal from Dr. Ross Hill of 4D LABS for the establishment of 4D LABS as a Schedule B Centre.

The Governing Committee for Centres and Institutes recommends that the Centre be granted approval by SCUP. Once approved by SCUP, the proposal is to be forwarded to Senate, followed by submission to the Board of Governors.

Governing Committee:



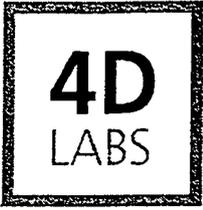
Dr. John Waterhouse
Vice-President, Academic and Provost



Dr. B. Mario Pinto
Vice-President, Research

Attachment

Cc: Dr. Michael Plischke, Dean of Science
Dr. Ross Hill, Executive Director, 4D LABS



SIMON FRASER
UNIVERSITY

Application for University Centre Status

Canadian entrepreneurs have made great strides in building the innovative, technology-enabled economy needed to succeed in the years ahead. The Government of Canada has helped lay the foundation for even greater success with very substantial investments in basic research - \$13 billion since 1997.

These investments are ensuring a continued flow of basic knowledge and highly trained people on which our future economic success depends.

Now we must do much more to ensure that our knowledge investment is converted to commercial success. We need to do more to get our ideas and innovations out of our minds and into the marketplace.

- Speech from the Throne (February 2, 2004)

I. Statement of Special Purpose

4D LABS, formerly known as the Centre for Research in Electronic Materials (CREM), was formed to accelerate the commercialization of university research in the areas of advanced materials and nano-scale devices. At 4D LABS, a multidisciplinary team of leading researchers will work to design, develop and demonstrate prototype devices that can lead to major advances in information and health technologies.

Background

Canadian universities have been recognized for their success in generating basic knowledge and creating the next generation of highly qualified people. This is because they provide a creative environment in which researchers are free to explore new and potentially disruptive ideas, and students have the opportunity to gain hands-on research experience using state-of-the-art equipment.

After investing \$13 billion into fundamental research since 1997, the Government of Canada is searching for unique ideas and opportunities to move these innovations into the marketplace

without jeopardizing the benefits inherent to the university environment. In a November 9, 2004 speech delivered at a Research Money conference entitled *Commercialization, What's Working and What's Not*, Dr. Arthur Carty, National Science Advisor to the Prime Minister said, "It is absolutely critical that Canada have the capacity to not only perform leading-edge R&D; but a world-class system for getting the ideas and discoveries to market – in other words reaping commercial value from this R&D."

At the same time, there is a movement among the British Columbia business community to create the BC Nanotechnology Alliance. While this organization is in its early stages of development, it is seeking funding to create a centre that links all of the nanoscience research in the province with the ultimate goal of attracting talent, investment and building new companies.

These initiatives at both the federal and provincial level create an environment in which 4D LABS will thrive and help to position SFU as Canada's most research-intensive comprehensive university.

4D LABS differs from other university research centres in its approach to choosing research projects and building teams. Rather than creating departments or networks of researchers with similar interests, 4D LABS starts by identifying technologies that require significant advances in basic science to become commercially viable. Then, 4D LABS defines multidisciplinary projects and recruits teams of international experts with the requisite skills and knowledge. Projects are currently underway in molecular electronics, photonics and magnonics, and 4D LABS plans to work with industry partners to identify new opportunities for commercializable research projects.

4D LABS (as CREM) has already gained support from the Canada Foundation for Innovation (CFI) and expects to have additional support from the British Columbia Knowledge Development Fund to create a new, state-of-the-art facility for these research activities. The evaluation committee for CFI noted, as an example, that, "the work in molecular electronics which, if realized, will fundamentally transform the nature of electronics and will push Canadian companies to the fore: this difficult area of research is already attracting the interest of the very largest global electronics companies. This research team is at the very leading edge of research internationally and with this infrastructure will undoubtedly have the tools and skills to make significant breakthroughs."

4D LABS integrates an international research team of chemists, physicists and engineers with expertise in nanomaterials engineering and devices. This team is united in its intent to lead the transformation from traditional electronic information processing systems to new technology platforms. Each member of the team has been internationally recognized and has a proven track record. Team specializations include functional molecules, functional solid state materials, surface chemistry and modification, electrochemistry, fabrication methods, lithography, polymers, biomaterials, materials characterization, theoretical chemistry and physics.

4D LABS will be operating in full force when the new facility is completed in September 2006. The facility will allow the team to exploit traditional clean-room technologies and infrastructure developed for semiconductor device fabrication and testing and apply them to novel nano-scale devices. The facility will include a fully equipped clean room specialized for nanometer device fabrication, a molecular-beam epitaxy growth facility and a photoelectron spectroscopy lab.

The unique clean room will allow for the development of novel processing chemistry that is incompatible with semi-conductor processing that takes place in other clean-rooms at SFU or elsewhere. It will house systems for deposition (sputter), lithography (both and E-beam writer and a mask aligner), processing (including etchers and a rapid thermal processor) and characterization (ellipsometer, optical microscope, profilometer).

4D LABS' Visiting Scientists' Laboratory will provide space for collaborators to conduct experiments that will prepare samples for fabrication and characterization in the 4D LABS clean room. The CFI evaluation team recognized the importance of this visitor's centre. "...as this will be the leading centre in the world it will attract the best collaborators and the MAC is keen to ensure that this process is facilitated." International collaboration is key to ensuring that Canadian researchers play an integral role in the early stages of a highly competitive, fast-paced area for research and development. The Visiting Scientists' Laboratory will facilitate knowledge transfer from international experts to the 4D LABS.

With an innovative approach to research in a growing, high-priority area, internationally-recognized talent and access to a new state-of-the-art facility, 4D LABS will provide tremendous value to the university. 4D LABS will provide:

- a demonstration of SFU's commitment to Government of Canada priorities;
- a connection to the local business community by acting as a major node of activity for the BC Nanotechnology Alliance;
- international profile; and
- potential revenue streams from significant technology breakthroughs.

II. Provision for the Appointment of a Director

Dr. Ross Hill, project leader for the CFI proposal that resulted in the creation of 4D LABS, will serve as Executive Director. He will report to the university through the appropriate Administrative Director according to the University Policy Policy (R 40.01) set forward for University Centres and Institutes.

III. Identification of the Applicable Schedule

4D LABS will have access to Visiting Scientists' Laboratory to attract the best collaborators from around the world. 4D LABS Principal User group (as defined in the CFI proposal) already extends outside Simon Fraser University and includes participants from University of British Columbia (Mike Wolf), University of Western Ontario (Mark Workentin) and the United States (Mike Scheinfein and Larry Dalton). Other users identified in the CFI proposal are from University of Alberta, Queens University, Korea and South America. 4D LABS also has collaborative links internationally that include Stanford and Cambridge University as well as Korea National Labs.

Within Simon Fraser University, the group currently includes faculty from the chemistry and physics departments, with plans to expand this to molecular biology and biochemistry and applied science.

Given the international scope of the research that will be conducted by 4D LABS, Schedule B is the most appropriate for ongoing activities, with the 4D LABS Administrative Director being SFU's Vice President of Research.

IV. Statement that Recognizes the Centre's Obligation to Conduct its Activities in Accordance with University Policies

4D LABS recognizes its obligation to conduct its activities in accordance with university policies.

V. Budget implications / Library needs

Ongoing funding development / Minimal

VI. Statement of Internal Governing Procedure

Dr. Ross Hill, the project leader for the CFI proposal that resulted in the creation of 4D LABS, will serve as Executive Director of 4D LABS.

The Executive Director will report to SFU's Vice President of Research as Administrative Director. This will ensure that 4D LABS operates within the guidelines of the University. The Administrative Director will report to the University's Governing Committee for Centres.

The Executive Director has appointed three Directors of research specific areas: Dr. Neil Branda, Director of Molecular Systems; Dr. Gary Leach, Director of Photonic Systems and Dr. Zuo-Guang Ye, Director of Solid State Systems as well as one Senior Science Advisor, Dr. Michael Scheinfein, Senior Science Advisor for Magnetic Systems. This team will work together to develop projects and then, using their research area-specific networks, build international teams of leading researchers to execute the projects.

