

Ontario's Photonics Landscape

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This paper discusses the status of photonics in Ontario. It is excerpted from a 'White Paper' study undertaken by the Centre for Photonics (CP) at the Ontario Centres of Excellence (OCE). It is based on industry interviews and a thorough review of Ontario's academic research.

Ontario has a strong photonics academic base with more than 100 principal investigators and 400 highly qualified people. 14 new photonics-related Canada Research Chairs have been established since 2003. Ontario also has world-class research institutes, eg, the Canadian Photonics Fabrication Centre.

Public funding of academic research has been of the order of \$10.7M pa (compared to \$150M pa in capital market investment and over \$500M pa in industry R&D spending). We have identified 10 academic research categories and determined funding profiles for OCE, NSERC and CIPI¹. As can be seen in Fig. 5 academic research is heavily focused in a few areas, in particular biophotonics and nano-photonics.

Funding agencies might consider a more balanced strategy addressing industry needs. The previous section identified six market segments, each with strong Ontario exports. Focusing public-sector academic research funding in only two areas suggests a preference for future commercialization opportunities rather than current industry needs. Significant job growth comes only from industry, ie, from SMEs growing, ultimately to large companies. By ignoring today's industry needs, funding agencies may be missing opportunities for economic development and job creation.

Photonics in Ontario is world class. While Ontario no longer dominates telecommunications/optical communications, the lack of single global sector dominance must not be allowed to detract from Ontario's significant strengths and achievements. Ontario's photonics-related firms dominate niche markets across a broad range of sectors providing high-value jobs, significant exports and a solid base for innovation and economic development. As well, Ontario has a broad

base of SMEs, its academic base is sound, and capital market investments have been robust.

Arguably, it is an optimum situation – providing greater diversity and resilience against competition than attempting global sector dominance, if indeed the latter is even possible in today's global economy. If it is, the required innovation and investment strategies are well beyond the scope of the present paper.

Finally, competing jurisdictions still see photonics as a key enabler of economic development and growth, with innovation investments targeted to industry and/or cooperation between industry and academia. The US Small Business Innovation Research (SBIR) Program and the European Framework (FP7) Program have seen significant budget increases, unlike NRC's Industrial Research Assistance Program, which has not seen significant budget increases over the last decade and is currently over-subscribed, in Ontario, until 2009. While Ontario's innovation landscape has notable strengths, the lack of robust support to its innovative firms puts them at a significant competitive disadvantage. It also means there are fewer employment opportunities for Ontario's new graduates and future innovators.

¹ NSERC and CIPI profiles were provided by CIPI and are pending approval.