

A **SUCCESS** STORY

MORE AFFORDABLE, COMPACT AND ENERGY-EFFICIENT **OPTICAL CHIPS**

The number of Internet-connected devices continues to grow rapidly. The capacity and quality of those connections must therefore be improved on a continual basis. These improvements must be made to ensure more effective and energy-efficient connections at a lower cost. Working in collaboration with professors **Mohamed Chaker** of the **Institut National de Recherche Scientifique – Centre Énergie Matériaux Télécommunications (INRS-EMT)**, **Michaël Ménard** of the **Université du Québec à Montréal** and **AEPONYX**, a Quebec-based SME, has developed advanced nanomanufacturing processes that can prototype integrated silicon nitride photonic devices.


Under this research project, academic and industrial researchers used high-tech equipment to broaden their horizons and acquire new technical know-how. With access to advanced microfabrication tools and simulation software, they were able to build and characterize state-of-the-art prototypes while learning about the various challenges involved in optical communications and microsystem commercialization.

Among other highly significant benefits, the work led to the improved performance of the AEPONYX optical microswitch platform and a transition to commercial foundries. The work led to a new optical switch demonstration, but it also highlighted the challenges and opportunities involved when improving the platform. Another project, earmarked for completion in the near future, explores new ways to facilitate the packaging of integrated optical chips by implementing new platform features. It is also intended to investigate ways to leverage the platform's capabilities to create new bandwidth and centre wavelength tunable optical filters, the building blocks of tomorrow's elastic optical networks. Through these efforts, AEPONYX was able to develop a new generation of optical chips that are more affordable, compact and energy-efficient. The company's patent portfolio has grown to 34 patents. This technological breakthrough will help cement AEPONYX's position as a world leader in next-generation telecommunications chips.

The collaboration also helped train a number of students, all of whom now hold advanced design and nanomanufacturing skills. Six of these students have since joined the AEPONYX team. In addition to this, the company successfully raised \$21 million to launch its commercialization phase and is set to become a key player within Bromont's innovation zone, where it plans to develop a supply chain for semiconductors, a material currently in short supply.

 *Collaboration with universities and CTTTs is at the heart of our DNA. Since our inception, we have supported a number of collaborative projects, all of which have made AEPONYX a high-level, world-class player in innovation.*

Quebec is home to a fantastic collaborative support structure, providing a unique form of leverage on the global stage.

The INRS and UQAM project, facilitated by PRIMA Québec and the NSERC, has only solidified our technological base. 

- **Philippe Babin**,
Chairman and CEO,
AEPONYX



SECTORS

Telecommunications



APPLICATIONS

Microelectronics



TRL

4



DURATION

36 months
[2018-2022]