

## Company profile

Arne Leinse\*

# LionX: our chips enable your products

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## 1 The company

LioniX is a leading co-developer, manufacturer and provider of products and components based on cutting-edge micro/nano technology for its original equipment manufacturer (OEM) customers. LioniX provides design to manufacturing and “horizontal integration” by partnering with foundries, suppliers of complementary technologies and R&D institutes. LioniX offers small volume manufacturing, second sourcing, as well as transfer to medium and high volume manufacturing. The company specializes in applications of integrated optics, microfluidics and optofluidics, including surface functionalization.

## 2 The optofluidic technology

In an optofluidic application, a fluidic channel can be probed with an integrated optical waveguide, and absorption, fluorescence or refractive index measurements can be done. The integrated optical waveguide is realized in the proprietary waveguide technology (TriPleX) of LioniX.

TriPleX waveguides form a new class of integrated-optical planar lightwave circuits, using low-cost, CMOS-compatible fabrication equipment. The waveguides are based on low pressure chemical vapor deposition (LPCVD) processing of alternating  $\text{Si}_3\text{N}_4$  and  $\text{SiO}_2$  layers. TriPleX technology allows for medium and high index-contrast waveguides that exhibit low channel attenuation. In addition, TriPleX waveguides are suitable for operation at wavelengths ranging from 405 nm through 2.35  $\mu\text{m}$ . The

high index-contrast and broad wavelength range make the TriPleX technology extremely suitable for a variety of applications, ranging from telecom to sensing. Besides silicon as a carrier, the TriPleX technology can also be combined with fused silica, which makes it extremely suitable for a Lab-on-a-Chip.

## 3 An example

In microreactor technology, the integration of waveguides can have a high added value to monitor the reactions inside a fluidic chip. By using a light source with multiple laser line widths (like for instance a Hyperion light source of XiO Photonics [http://www.xiophotonics.com/products/hyperion\\_multicolor\\_laser\\_source/](http://www.xiophotonics.com/products/hyperion_multicolor_laser_source/)), a spectral fingerprint of a reaction in the fluidic channel can be obtained in, for instance, microreactors. In the picture, an example of an absorption based sensor in a fluidic channel is shown.



*Optofluidic chip with fluidic channel (in blue) and waveguide (in yellow)*

## 4 The people (CEO)



carried out research, as well as development work, resulting in many products available on the market such as pH-ISFET systems and accelerometers. During his career, he has been responsible for marketing and sales (CSEM and TMP), as well as for the production of Microsystems (Sentron, CSEM and TMP), as head of silicon foundries and subcontracting higher volumes to other foundries and assembly companies. He has also been responsible for the Mesa+ Nanolab. He was active in European programs as a project leader for large projects, such as Europractice, and was also a member of the board of Nexus and Eurimus. At present, amongst others, he is member of the board of IVAM and project coordinator of the large Memphis project (>30 MEuro's research program on photonics in the Netherlands). He has written over 50 papers and holds several patents in various fields.

Hans van den Vlekkert has been active in the microsystems technology (MST) for nearly 30 years. He has

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