



Custom Microsystem Development and Production through  
Design for Manufacturing and Horizontal Integration

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# MEMSland Business carrier 6

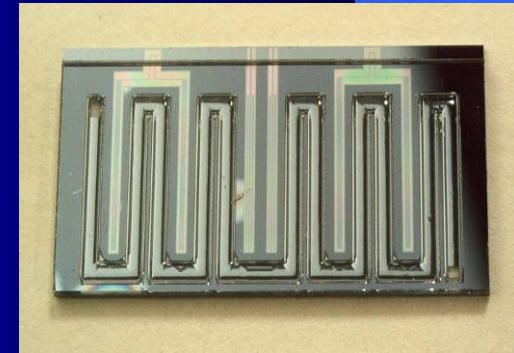
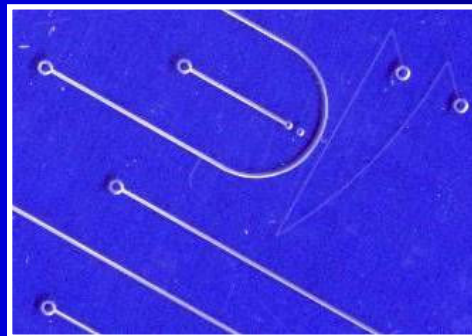
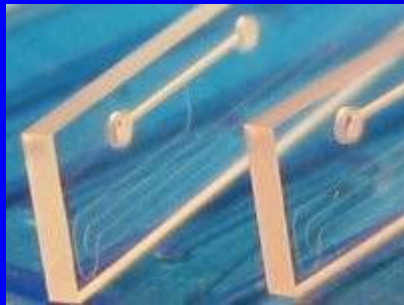
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## Optical Sensor

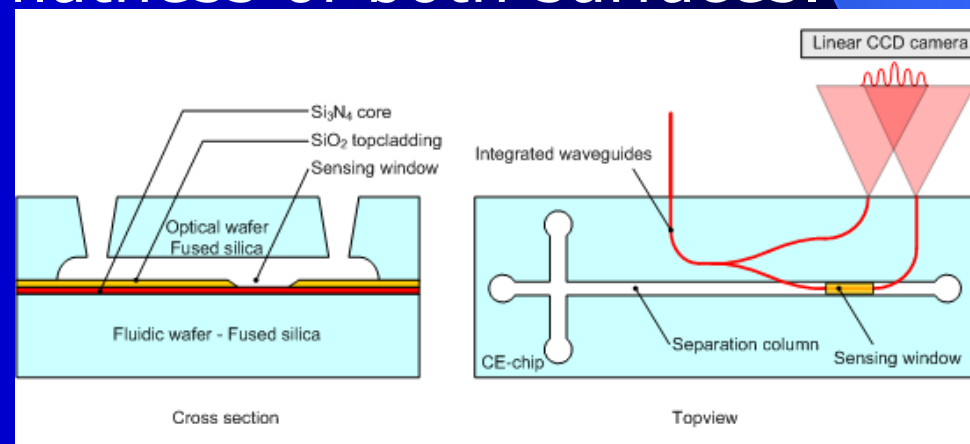
# Monolithic integration of planar waveguide technology and microfluidics

- LioniX has a breakthrough technology for integration of planar waveguide technology for microfluidic applications.
- Applications are in space, life sciences, environmental sciences and security.



# Technology

- The technology development involves the transfer of integrated optical technology from silicon substrates to fused silica substrates, while maintaining the optical properties of the silicon nitride / silicon oxide waveguide and controlling the mechanical stress.
- The optical wafer is directly bonded on a fluidic channel wafer. The direct bonding technology involves no glue or other strange materials and requires nanometer flatness of both surfaces.



# Optical sensor

- The Young Interferometer and/or MZI based optical sensor is integrated in glass as well as silicon with on top a microfluidic structure for transporting liquids or gasses to the sensor surface.
- The combination of optical and microfluidic sensor is favourable since very sensitive devices can be created.
- The optical sensor contains silicon ( $\text{SiO}_2/\text{Si}_3\text{N}_4$ ) based waveguiding layer for the transportation of the optical signals. The glass based microfluidic wafer contains the structures for transporting the fluids.