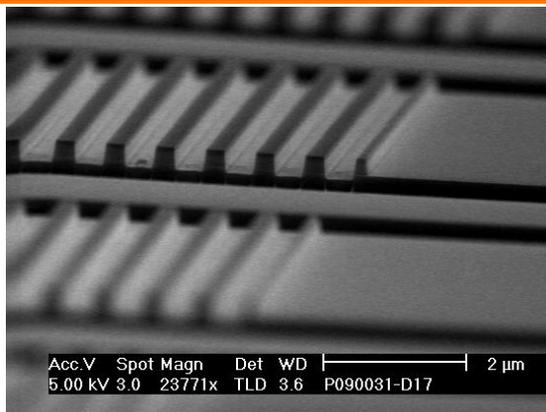


## SwIFT

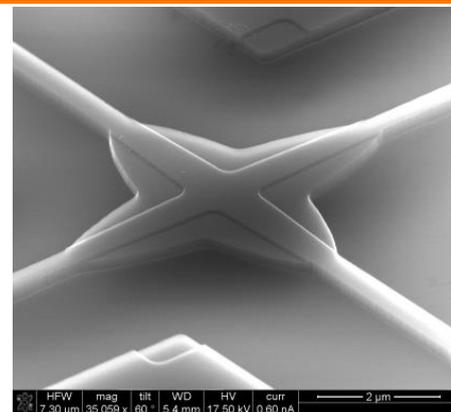
### Optical Switch combining Integrated Photonics and Fluidics Technologies

As networks grow by adding more and more optical bandwidth, the number of optical fiber connections is growing at an explosive rate. Reducing operational expenses associated with installing, provisioning and maintaining the embedded fiber plant and especially optical connections is becoming more and more important in today's competitive carrier landscape.

In SwIFT, European experts investigate and develop the concept of an optical switch fabric. With the integration of two innovative technologies, silicon photonics and fluidics technology, the consortium will realise the solution that is needed by telecom operators to enable future, flexible and manageable networks, from data centres to core and access networks.



(a)



(b)

SEM pictures of silicon photonic circuits and devices: (a) high-efficiency grating coupler, (b) waveguide crossing

SwIFT will investigate the integration of fluidics with the CMOS-compatible integrated silicon photonics technology to realise a compact multi-port optical switch. Integration of both technologies combines the best of both worlds: silicon photonics is known to be low cost, has a small footprint and is made by a proven, reliable CMOS technology, while fluidic technologies offer flexible solutions at a low operational power consumption and meet demanding outdoor specifications.

The Technische Universität Ilmenau will explore switch and switch matrix actuation based on electro-wetting on dielectrics (EWOD). This comprises the layout of the microfluidic part including the required electrodes and coatings for EWOD. Besides the actuation of the two-phase fluid (that is comparable to segmented flows) the assembly and filling of the large matrix is a major task. Major challenges are the selection of proper fluids that have to fulfill the optical and electrowetting requirements.