

## FIREFLY Research progress after 6 months

5 April 2012

After six months of research and development the FIREFLY consortium achieved the first results. In the inspiring surroundings of Tyndall National Institute in Cork, Ireland, we came to the following conclusions:

- Together with all partners imec has designed the lay-out of the first demonstrators to be delivered. These demonstrators will start relatively easy with straight waveguides, one VCSEL and an out-coupling device. Next demonstrators will include bends. The reason to start with designing the demonstrators was to identify the critical aspects in the integration as soon as possible.
- Modeling activities of Tyndall, TE Connectivity and IBM have resulted in the required dimensions for the polymer waveguides as well as the power and loss budgets for the total system.
- Siloxane materials with reasonable loss have been made available by Momentive, and have been tested by partners imec, VTT, IBM, Tyndall and TNO. The experiments were aimed at refractive index, optical loss and the possibilities of laser writing (see figure 1), laser ablation, nano-imprinting and adhesion with gold. First material tests showed quite promising results. Further developments on the optical loss are currently in progress in order to improve the silicone for its application in waveguides.
- Regarding the photonic crystals, the University of Utrecht showed some first results with monodisperse particles. TNO presented a new set-up for the deposition of nanoparticles in imprinted substrates (see figure 2).

The overall conclusion is that we already have achieved promising results, but we also identified a lot of challenges still to tackle.

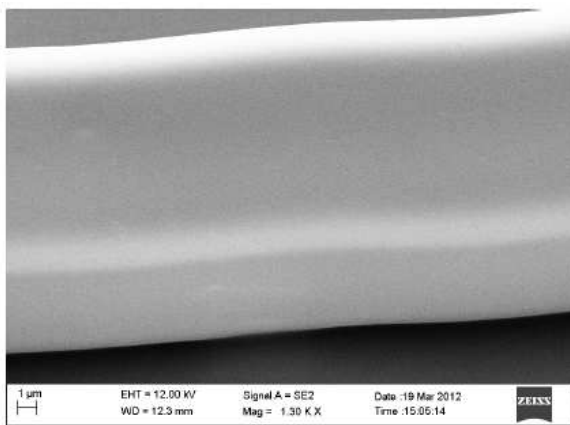


Figure 1.

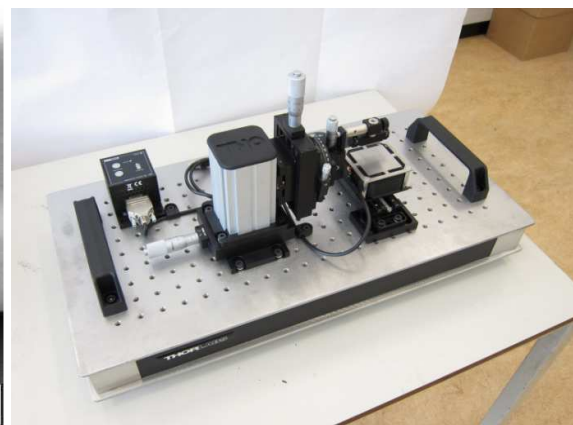


Figure 2.