

## **Executive publishable summary – N2T2 Devices**

### **1.1. Project objectives**

The main goal of N2T2 is to establish and deploy versatile nano-replication technologies based on porous alumina, for manufacturing novel sub-wavelength photonic elements with superior functionality. The specific objectives of N2T2 are:

- To establish technologies for fabricating hard nanoimprint moulds based on highly ordered porous alumina and multiplexing the pattern over large areas to create nanoimprint masters with feature sizes down to 50 nm over areas of up to 10x10 mm as a basis for pattern replication over much larger areas;
- To establish novel nanoimprint processes for pattern transfer, up to 200x200 mm at a time, into UV curable pre-polymers or thermo-plastics for mass volume manufacture of large area arrays of sub-wavelength photonic elements and create the new nano-fabrication technology of Disposable Masters;
- To show the capability of the new nanofabrication technologies through their application to forming innovative electrode nanostructures and broadband antireflection coatings based on motheye nanostructures for advanced large area, low cost Organic solar cells;
- To establish compatibility of the anodised porous alumina nanoimprint technology with semiconductor fabrication technologies to realise high brightness, short wavelength light emitting devices that utilise arrays of quantum dots of pre-engineered shape and uniformity;
- To show the application of the new nanoimprint technologies, in particular Disposable Master Technology, to the fabrication a range of photonic crystal (PhC) structure devices with integrated high aspect ratio light coupling devices for low loss interconnection between PhC lightwave circuits and optical fibre systems.

### **1.2. List of participants**

CO 1 AIXTRON AIXTRON Germany

CR 3 Konarka Kon Austria

CR 5 MacDermidAutotype International Ltd AIL UK

CR 7 University Roma Tre Roma Italy

CR 8 Johannes Kepler Universität Linz JKU Austria

CR 9 University of Bath UoB UK

CR 10 International Laser Center, Bratislava, ILC Slovakia

CR 11 Holotools GmbH Holo Germany

The consortium consists of four industrial partners (AIXTRON, Konarka, MacDermid Autotype, Holotools) and four international level academic laboratories (Uni Bath, Uni Linz, Uni Roma, International Laser Center). They join their complementary expertise to develop the novel nano-template technology and its applications to the fabrication of novel photonic devices.

### **1.3. Coordinator contact details**

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