

“Advanced nanomanufacturing: from parallel to continuous processes for sub 50 nm structuring”

Throughout the last years consumers needs have created new trends and requirements for their products. The need for flexible, light weight, energy saving and low cost products have lead the nano-manufacturing industry to look into new technological platforms and therefore move from the rigid technology to flexible processing technology.

Direct imprinting of three dimensional (3D) structures is a challenging aspect of nanoimprint lithography (NIL). The main drive for 3D fabrication is the cost reduction as the number of process step needed to build a device is reduced. Moreover the requirement for even more compact devices generates an additional need for 3D nano-manufacturing. In this presentation we will discuss the combination of lithography technologies (NIL and block copolymer self assembly) to achieve sub 50 nm structures over large areas keeping the manufacturing costs at moderate levels.

Recent manufacturing technologies have advanced to the stage where inexpensively printed high performance devices on continuous rolls of polymer-based substrates now promise to revolutionize advanced manufacturing. We will show how roll-to-roll (R2R) manufacturing processes can make it possible to economically generate high value-added technology products at meters-per-minute rates on plastic films/foils and to achieve feature dimensions as small as 10 nm over areas encompassing billions of identical devices.

CV

Dr Nikos Kehagias graduated from the Physics department of Aristotle University in Thessaloniki, Greece in 2002. He has a Master degree in “Physics of laser communications” from Essex University, UK. He obtained his PhD in 2007 from the National university of Ireland, Cork where he continued to work as a post doctoral fellow until May 2008. He joined the ICN in May 2008, first as member of the Phononic and Photonic Nanostructures. Since July 2010 he leads the nanofabrication division of ICN. He is author of 30 journal publications, including 2 book chapters in the field of nanofabrication and nanoimprint lithography, in particular and has pioneered the use of RUVNIL – in full.