

November 15, 2007

Industry Day of the EU project “Emerging Nanopatterning Methods” NaPa: nanomanufacturing library of processes presented.

The EU Integrated Project “Emerging Nanopatterning Methods” (NaPa) held a one-day event to share its novel and exciting results on nanometre-scale fabrication with potential beneficiaries in a rich seminar programme accompanied by a small technical exhibition. The project coordinator, Prof Jouni Ahopelto of VTT, Finland, introduced the €31 million 4-year project to over 80 participants, mainly from industry, gathered at the Magnus House in Berlin on 29th October. He highlighted the innovation and potentials of several technologies, which are now at the cross-road between applied research and uptake by industry. Speakers elaborated on exploitable results emerging from the 34 project partners in fields including: soft lithography, self-assembly, nanoimprint lithography (NIL) and MEMs-based approaches. Key results included the complete development of a new nanomanufacturing tool by SET S.A.S. in France, capable of handling 300 mm wafers and the adaptation of existing semiconductor tools by EVG in Austria, to make them suitable for nanopatterning of several materials. Development of research instrumentation for self-assembly and scanning probe-based nanofabrication were also presented. Resists for nanopatterning developed in this project are already commercially available from micro resist technology GmbH. Applications mainly in the medical area and in photonics were presented.

One of the main highlights was the public debut of the NaPa Library of Processes, presented by Dr Helmut Schiff of the Paul Scherrer Institute (PSI), Switzerland, which includes processes for scalable and cost-efficient manufacturing of e.g. polymer-based optical elements, organic LEDs and lab-on-a-chip systems among others. The NaPa library currently consists of eight well tried processes. The uptake of the NaPa project results will strongly impact the manufacturability in nanotechnology. The NaPa library of processes will be released in March 2008.

An example of nanopatterning methods leaving the research laboratories and making inroads in industry was presented by Dr Vito Lambertini, Fiat Research Centre, Italy. He illustrated how NIL and roll-to-roll printing in particular is becoming a strong candidate in the automotive industry, addressing the innovations demands in performance, cost reduction and environmental compatibility for example, new organic light-emitting diodes for displays. In the car industry nanotechnology contributes to improvements on surface cleaning, fuel saving cells, solar panels, among others.

From the tool makers, Mr Babak Heidari, CTO of Obducat in Sweden, discussed the conditions needed for high volume manufacturing and introduced proprietary concepts to meet them. He mentioned that already light sources are produced by NIL. The other promising prospects of NIL to be used in the manufacturing of magnetic drives and optical media, which requires reproducible and large area patterning with 40 nm pits, as well as the next generation of blue ray with capacity larger than 100Gb.

Mr Theodor Nielsen, CEO of NIL Technology, a spin-off of the NaPa project specialised in stamp fabrication, commented on how hundreds of companies world-

wide are using nanoimprint lithography in a range of industrial areas such as security, energy, paper, storage, medical and lighting. His company is “enabling commercial nano”. Mr. Mike Watts of Impattern Solutions presented an analysis of the status of NIL and commented how Europe has the whole supply chain for NIL. He illustrated the type and volume of the actual and prospective markets, which are in the US\$ 1 billion per year range. He emphasised the need to establish Cost of Ownership agreements and benchmark cost for devices since tools and stamps are the most cost intensive aspects on this new technology. In his opinion the opportunities and next wave of application are in functional imprints including 3D optical surfaces and bio compatible surfaces as well as devices on integrated circuits. Europe is very well positioned to play a major role in nanomanufacturing but there is strong competition from other parts of the globe. The NaPa project has made this positioning possible, as one of the 40 most successful projects of the European Commission 6th Frame program.

NaPa Integrated Project WEB site: <http://www.NAPAIP.org>

About NaPa: The aim of **NaPa** is to strengthen the potential of nanotechnology within the European Research Area by bringing together the existing expertise in the field of nanopatterning methods. This integration of expertise constitutes the foundation for innovations leading to breakthroughs in the field of nanofabrication, thus, paving the way to efficient exploitation of the potentials of nanotechnology.

The **NaPa** project addresses the Community socio-economic objectives from many vantage points. In response to the need for the transformation of industry towards higher added-value operation, the consortium benefits from each industrial participants, which ensure that the nature of nanopatterning addresses future demands of the ICT, pharmaceutical, biotechnology, health and medicine sector.

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