

PRESS RELEASE

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NanoNord Officially Opened By The Grand Duke of Luxembourg with participation by Crown Prince Frederik of Denmark

With a push on a button His Royal Highness, The Grand Duke Henri of Luxembourg marked the entry of a new technology in the business life of Jutland, Denmark.

In front of approximately 180 guests it was the Grand Duke himself who started the first nanotechnological process in the new laboratory which is a joint venture between NanoNord, Aarhus University (represented by iNANO*), and Aalborg University.

In fact, the Grand Duke produced his own present – as he started a sputtering process to fix a nano-thin layer of pure gold on a silicon disc to bring home to Luxembourg.

The sputtering process was a concrete demonstration of the unbelievably small scale in which the Nano-world operates.

In his speech to the guests, Managing Director Ole Jensen underlined the necessity of a successful co-operation between the private sector and the universities. He said (extract): 'New innovative ways of co-operating with the regional research institutions is the key to commercial success. They are part of this global knowledge base and the better the interaction works with this knowledge base, the bigger the likelihood is for creating a successful business'

Managing Director Ole Jensen, NanoNord also spoke of the sizes and possibilities of Nanotechnology and illustrated these by mentioning the 'Father' of Nanotechnology, Nobel Prizewinner Richard Feynman and his theory in which he calculated the amount of atoms it would take to encode the world literature of 1959, i.e. the Encyclopaedia Britannica and all volumes of the major world libraries. According to Feynman's calculations the information of a total of 24 million volumes, digitally encoded, could be represented by a dust-like metal cube with a width of 0.13mm. Feynman's conclusion anno 1959: "There is plenty of room at the bottom".

Ole Jensen updated Feynman's theory to the year 2003 by showing that all the world's information stored on approx. 1 Billion hard disks would still only take up 230nm of gold atoms **) on a silicon disc of 4 inches in diameter, and Ole Jensen concluded: 'There is STILL plenty of room at the bottom'.

The Crown Prince received a similar silicon disc.

NOTES:

***) The Grand Duke himself sputtered gold in a 230 nm layer onto a silicon disc of approx. 10 cm (4 inches) i diameter. The gold layer on the disc formed the text: 'There is still room at the bottom' and the logos of NanoNords and Aalborg University
The total number of gold atoms on the disc: 100.000.000.000.000.000.000 (10²⁰).

About NanoNord

NanoNord A/S is a private limited company which a current staff of 12 researchers/engineers etc. NanoNords R&D and production facilities include a class 100 clean room of 1000m² and advanced equipment for nano-research, development and production in areas such as litho,- dry and wet etching, spluttering of materials, and metrology equipment etc.

About iNANO

interdisciplinary Nanoscience Center for Aarhus University and Aalborg University. www.inano.dk

About Nano-technology:

'Manufactured products are made from atoms. The properties of those products depend on how those atoms are arranged. If we rearrange the atoms in coal we can make diamond. If we rearrange the atoms in sand (and add a few other trace elements) we can make computer chips. If we rearrange the atoms in dirt, water and air we can make potatoes.

Today's manufacturing methods are very crude at the molecular level. Casting, grinding, milling and even lithography move atoms in great thundering statistical herds. It's like trying to make things out of LEGO blocks with boxing gloves on your hands. Yes, you can push the LEGO blocks into great heaps and pile them up, but you can't really snap them together the way you'd like.

In the future, nanotechnology will let us take off the boxing gloves. We'll be able to snap together the fundamental building blocks of nature easily, inexpensively and in almost any arrangement that we desire. This will be essential if we are to continue the revolution in computer hardware beyond about the next decade, and will also let us fabricate an entire new generation of products that are cleaner, stronger, lighter, and more precise.'

Nanotechnology 'should let us:

Get essentially every atom in the right place.

Make almost any structure consistent with the laws of physics and chemistry that we can specify in atomic detail.

Have manufacturing costs not greatly exceeding the cost of the required raw materials and energy.'

Source: Ralph C. Merkle

<http://www.zyvex.com/Research/Publications/sites/MerkleNano.html>

About the co-operation:

The aim of the co-operation is to create an environment where research results are commercialized to a great extent as a result of the interaction between the researchers and the private sector. On the other hand the co-operation will also improve the quality of the public research and the educational sector as it combines theory and practice.

The co-operation exists since April 2003 and one of its' consequences is that the Physics and Bio-tech Institutes of Aalborg University will move into the same building as NanoNord to create the necessary environment.