Message from the Director

I take great pleasure in presenting the Annual Report 2008 for iNANO, The Interdisciplinary Nanoscience Center at Aarhus University. The center has grown and matured tremendously since its inauguration in January 2002, but we keep our ambitions high and expect the positive development to continue in the years to come. With this annual report, we seek to provide the reader with an overview of the highlights of the iNANO 2008-activities.

By Flemming Besenbacher

At the end of 2008, 60 senior researchers, 45 post docs, and 123 PhD students were associated with iNANO. Our overall mission remains focused on three equally important pillars; education of outstanding, young scientists, research at the highest international level and focus on innovation and technology transfer to the industry. We continously pursue this mission with focus and dedication.

Education and other student issues

The nanoscience study programme had the same intake of about 50 new students in 2008 as the year before, which is contrasted by the fact that virtually all other science educations in Denmark experienced a massive drop in student intake in 2008. At the end of the year the total number of iNANO students enrolled in the Bachelor and Master's educations in nanoscience were 133 and 83, respectively.

With their strong interdisciplinary background our Master's students are attractive candidates for jobs in industry and other private companies or as scientists at various public research institutions. The students who have finished their Master's and chosen not to continue with a PhD study have found employment in a wide range of companies such as Lundbeck, Topotarget, NIL Technology, Odense Stålskibsværft, and FLSmidt. In the coming years, where substantially more students will graduate, we look forward to getting a clearer picture of the types of industry that will employ our candidates and thus, benefit from their interdisciplinary competences. Because the nanoscience study programme is still relatively new, it is important to constantly increase the general awareness of the education. Therefore, iNANO arranged a Matchmaking event in January 2008, where iNANO students could interact closely with representatives from Danish companies.

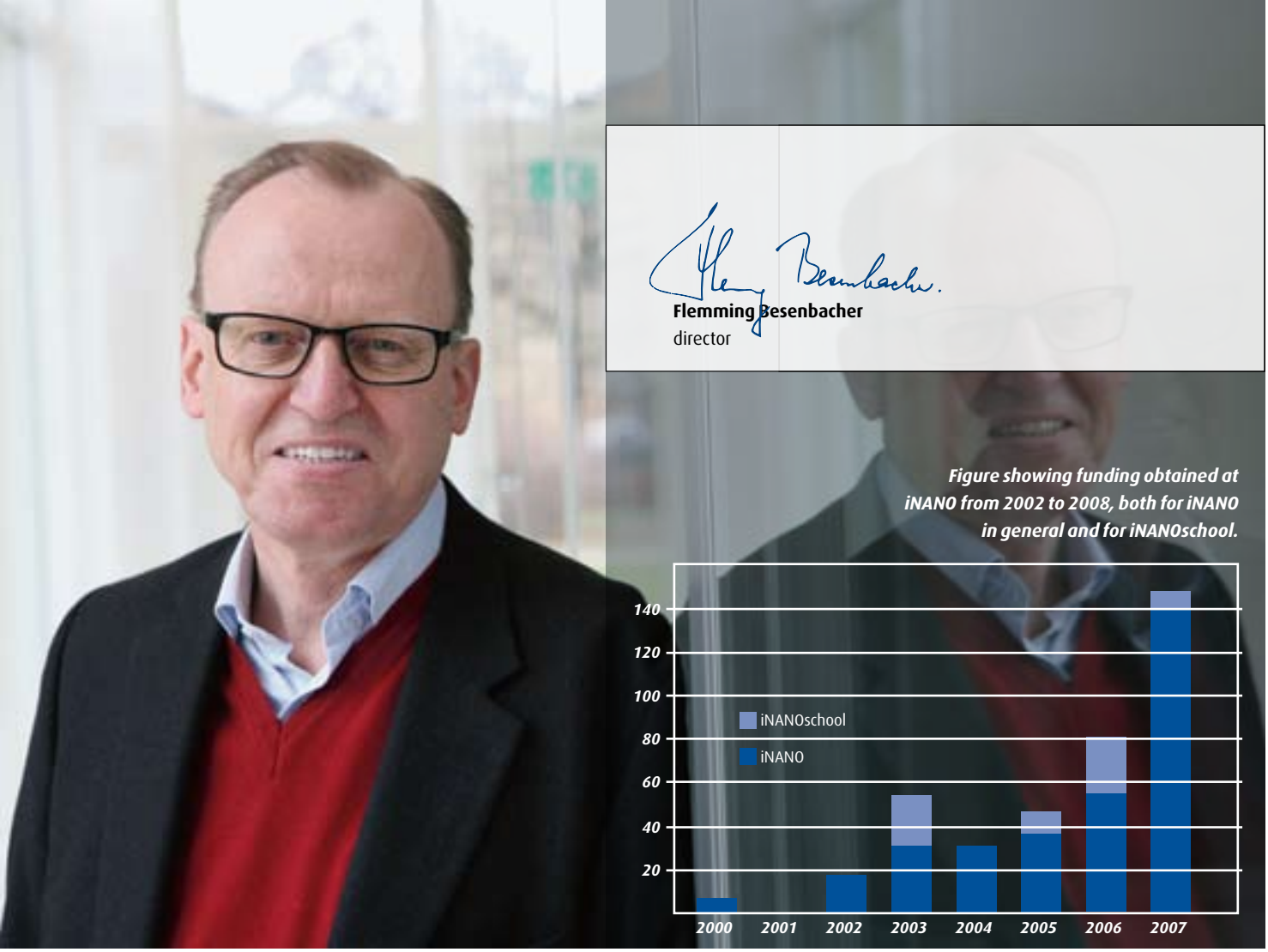
Our nanoscience students continue to impress and surprise with their enthusiasm and motivation. As a prominent example, I take pride in noting that three of our talented students Sofie Kastbjerg, Søren Porsgaard and Jakob Arendt Rasmussen won the Grundfos Challenge 2008 Innovation Award for their innovative suggestion for a new product Lab-on-a-tap, which is designed to provide consumers with safe and high-quality tap water. Another example is a group of our dynamic and dedicated nano-students who organized the second international, nanoscience student conference, INASCON, with participation of 100 students representing 8 different European countries. The students did an excellent job in arranging this conference which was a great success and thus, our students have once again promoted Danish education and research within nanoscience in the finest manner.

Research and funding

As evidenced by the examples in this annual report, iNANO scientists obtained excellent research results in 2008, which have been or will be published in high ranking, international peer-reviewed journals. A total number of 260 was published in 2008 by iNANO scientists, several in high profile journals like e.g. Science and Nature.

The full list of publications can be found at the end of this annual report together with a complete list of invited talks at international meetings and conferences. In addition, iNANO scientists continue to be recognized for their outstanding achievements. At this point, I will restrict myself to congratulate Professors Leif Østergaard and Poul Nissen, who both received the EliteForsk Award in 2008 in recognition of their outstanding contributions, and to Sigrid Weigelt who received Aarhus University Research Foundation PhD Prize.

iNANO scientists attracted a large number of research grants from various national and international sources in 2008. As can be seen from the figure above, the total funding secured by iNANO scientists and administered by the iNANO administration amounts to 104 million DKK, of which 21 million DKK are grants for our graduate school, iNANOschool. The primary national sources include: The Danish National Research Foundation, The Danish Council for Independent Research, The Danish Council for Strategic Research, The Danish Council for Technology and Innovation, Danish National Advanced Technology Foundation, and The Lundbeck Foundation. Among the grants obtained from international sources are several EU related grants, Marie Currie stipends and, in particular, two of the prestigious ERC grants.



Flemming Besenbacher
director

Figure showing funding obtained at iNANO from 2002 to 2008, both for iNANO in general and for iNANOschool.

Outreach initiatives

iNANO is involved in a large number of outreach activities, where the primary goals are to recruit new nanoscience students, to brand iNANO and Aarhus University and to enhance the general public's awareness of nanoscience and nanotechnology. The Matchmaking event mentioned above together with a new Nanoshow which was established during the autumn and described elsewhere in this report were among the new initiatives in 2008.

Innovation, collaboration and technology transfer to companies

At iNANO, we continuously strive to strengthen our collaboration with national as well as international companies. This goal is catalysed by the industrial companies' growing awareness of the potential and the possibilities that nanotechnology can provide for processes and resulting products. In 2008 iNANO's portfolio of industrial partners included more than 101 national and international companies.

Our collaboration with a company often begins with a co-financed PhD stipend, and in 2008 iNANO secured 8.7 million DKK for 14 co-financed scholarships from The Danish Council for Research Policy. Furthermore, by the end of the year a healthy fraction of 21% of our PhD students were co-financed by a Danish company. In the coming years we hope to further expand this fraction and thereby contribute to the effective knowledge transfer in a way, that may prove second to none.

iNANOhouse

The first turf for the building of the clean-room wing forming a part of a 10,000 m^2 laboratory complex was cut in August 2007. At the end of 2008, the new wing, containing a "class 100" clean room with an area of 210 m^2 including service areas, was finalized. When the clean room has been equipped with state of the art processing equipment, iNANO researchers will have excellent facilities to prepare and synthesize nanostructures of the highest quality and to train nano-students during their PhD or Master's projects. The remaining part of the laboratory complex is unfortunately somewhat delayed, and the complete complex will not be commissioned before the beginning of 2013.

Globalisation and China

An important goal for iNANO is to strengthen the degree of internationalization even further. Countries like China, USA, Japan and India are investing heavily in nanoscience in these years based on the expectation that nanotechnology will be decisive for their future competitiveness. In particular China is developing faster than any other nation, investments increase by about 20% each year, and the country has an enormous pool of highly-dedicated and talented students. We have to realize that China is already a pivotal global player with respect to economy, research and education, and it is of utmost importance that iNANO maintain and build up long-term relations with Chinese researchers. Therefore, iNANO has chosen to participate in the establishment of a Danish university centre in Beijing, and to play an active role. The goal is to intensify our cooperation with Chinese scientists, to enhance the visibility of our research and education in China, and thereby secure easier and better access to outstanding students for iNANO and Danish companies, and at the same time improve the possibilities for Danish students to study in China.

Acknowledgements

I would like to express my sincere appreciation for the tireless and devoted efforts which the scientists and the administrative staff of iNANO demonstrate year after year. They keep on performing outstandingly well, although they often work with very short deadlines. Heartfelt thanks also go to our students, who continue to surprise and thrill us with their enthusiasm and initiatives. On this basis, I am confident that iNANO is well prepared for any given challenge that might occur in 2009.