



NANOMAT – Nanotechnology and new materials

# NANOMAT – Birkeland conference 2005

 The Research Council of Norway | Large-scale programmes

*Radisson SAS Royal Garden Hotel, Trondheim*

*2–3 June 2005*



– organized in co-operation with  
The Norwegian Academy of  
Technological Sciences (NTVA)

## NANOMAT-nanotechnology and new materials

Nanotechnology and materials technology are strategically important fields of scientific research with a substantial commercial potential.

Nanotechnology includes nanoscience and may be defined as: “new techniques for synthesis and processing, including manipulation and assembly using nature's own building blocks (atoms, molecules or macromolecules) for the intelligent design of functional materials, components and systems featuring attractive qualities and functions and where dimensions and tolerances from 0.1 to 100 nanometers (nm) play a decisive role”.

Nanotechnology is interdisciplinary, embracing physics, chemistry, biology, molecular biology, medicine, electronics and ICT.

**The Research Council has established the instrument large-scale research programmes in order to address policy research priorities that are of crucial importance to society.** The aim of the NANOMAT initiative within nanotechnology and materials technology is to enforce basic knowledge in order to pave the way for new knowledge-based and research-intensive industry, and provide a sustainable revitalisation of established Norwegian industry. The programme aims at inducing research of high international quality. It has set two major priorities:

- To develop new materials, with the focus on functional materials
- To focus on selected parts of nanotechnology – including improvement of structural materials by use of nanotechnology.

**The programme runs 2002–2008.**

– an extension towards 2011 is under preparation.

## World Year of Physics



The United Nations have decreed 2005 as the World Year of Physics. The background for choosing the year 2005 is that we celebrate the 100th anniversary for the publication of three of Albert Einstein's most important papers this year. The papers were on the photoelectric effect, Brownian motion and the special theory of relativity. These papers, in addition to the quantum mechanics, laid the foundation for many important theories and innovations. It made possible the utilisation of the enormous amounts of energy stored in the nucleus of atoms as well as the understanding of the properties of semiconductors, one of the cornerstones of modern technology.

<http://www.fysikk2005.no/kalender/skjema.html>

## The Birkeland jubilee



The national committee for the World Year of Physics and the The Research Council of Norway, in collaboration with Norwegian Academy of Technological Sciences (NTVA) wish to honour the work of Kristian Birkeland in 2005. The timing is appropriate for several reasons. Birkeland is probably Norway's best known physicist and his theories for the origin of Northern light and his ideas about the energy transfer from the sun to the upper atmosphere were ahead of time and is in many ways the foundation of modern space research. To the general public he is known for the Birkeland-Eyde method for the production of salpeter and the establishment of Norsk Hydro in 1905. The fact that the year 2005 is the 100th anniversary of Norway's independence as well as the foundation of one of the central players in Norwegian industry makes a celebration of Kristian Birkeland a natural choice.

Birkeland was a man with a wealth of ideas and the coupling between fundamental research and industrial research and his ability to popularise and engage made him a model, a model from which we still has a lot to learn.



## Call for papers NANOMAT-Birkeland conference 2005

The NANOMAT-Birkeland conference 2005 is organized by the Research Council of Norway and The Birkeland Conference in Trondheim from June 2–3.

One of the objective for the conference is to show how nanotechnology and new materials will have significant impact on future innovations and technological developments in Norway and world wide. The other objective is to present the research activity within nanotechnology and new materials in Norway and neighbouring countries and innovative projects within relevant industry. There will be a mixture of invited plenary lectures and key notes in addition to open call for papers whithin selected topics.

Authors are invited to submit an abstract of up to 500 words for presentation on one of the conference themes to the conference comittee not later than **March 1, 2005**. Submission should include the presentation title, authors/presenters (with affiliations), address, telephone, and e-mail address of the corresponding author/presenter, and an abstract of the presentations. Abstracts will be reviewed by the organizing committee.

### Conference Themes

- Energy and materials
- ICT and optics
- Cross diciplinary research

### Poster session

There will be a poster session on June 2. Title for the poster presentations should be submitted to the the administration within May 15, 2005.

### Publication

The presentations and posteres will be presented at the NANOMAT web page after the conference.  
<http://www.forskningradet.no/nanomat>

### DEADLINES

Submission of an extended abstract:

**March 1, 2005**

Notification of acceptance:

**April 1, 2005**

Presentation final program:

**April 1, 2005**

Registration to the conference:

**May 1, 2005**

Submission of poster Title:

**May 15, 2005**

## Information and registration

Registration fee:

|               |             |                          |
|---------------|-------------|--------------------------|
| Ph.D students | no fee      | <input type="checkbox"/> |
| Others        | NOK 1.000,- | <input type="checkbox"/> |

Hotel accommodation, Radisson SAS Royal Garden Hotel – full pension in single room includes breakfast buffet, lunch both days w/mineral water and a 3 course dinner w/wine:

|               |             |                          |
|---------------|-------------|--------------------------|
| Ph.D students | NOK 1.000,- | <input type="checkbox"/> |
| Others        | NOK 1.900,- | <input type="checkbox"/> |

Conference participation June 2 – including lunch w/mineral water:

|               |           |                          |
|---------------|-----------|--------------------------|
| Ph.D students | NOK 150,- | <input type="checkbox"/> |
| Others        | NOK 400,- | <input type="checkbox"/> |

Participation Conference dinner June 2 – a 3 course dinner w/wine:

|               |           |                          |
|---------------|-----------|--------------------------|
| Ph.D students | NOK 300,- | <input type="checkbox"/> |
| Others        | NOK 550,- | <input type="checkbox"/> |

Conference participation June 3 – including lunch w/mineral water:

|               |           |                          |
|---------------|-----------|--------------------------|
| Ph.D students | NOK 150,- | <input type="checkbox"/> |
| Others        | NOK 400,- | <input type="checkbox"/> |

## Personal information

Title: Prof.  Dr.  Mr.  Ms.  Other

Last name:

First name:

Organization:

Street address:

Zip code:  City:

Telephone:  e-mail:

## Organizing committee:

*Arne Skjeltop, Institute for Energy Technology*

*Rune Bredesen, SINTEF Materials and Chemistry*

*Poul Norby, University of Oslo*

*Ola Hunderi, The Norwegian University of Science and Technology*

*May-Britt Hägg, The Norwegian Academy of Technological Sciences*

*Dag Høvik, The Research Council of Norway*

*Aase Hundere, The Research Council of Norway*

## Conference administration

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# Tentative program – NANOMAT-Birkeland conference 2005

*Thursday June 2*

| Schedule  | Title  | Speaker   |
|-----------|--|---|
| 0930–1000 | <b>Arrival and registration</b>  |   |
| 1000–1010 | <i>Welcome</i>   | <i>Karin Refsnes, The Research Council of Norway</i>                                |
| 1010–1030 | <b>Nanotechnology and new materials in the perspective of the 2005 White paper on research</b>                               | <i>A representative from the Ministry of Education and Research – not confirmed</i> |
| 1030–1115 | <b>Norway as an innovative materials producer – what can we learn from Birkeland today?</b>                                  | <i>Egil Myklebust, Former Chairman of Norsk Hydro ASA, Norway</i>                   |
| 1115–1200 | <b>Nanotechnology from an international perspective – and what happens in Norway</b>   | <i>Bengt Kasemo, Chalmers University of Technology, Sweden</i>                      |
| 1200–1300 | <i>Lunch</i>   |   |
| 1300–1330 | <b>How can nanotechnology and new materials contribute to make Norway one of the most innovative countries in the world?</b> | <i>A representative from the Ministry of Trade and Industry – not confirmed</i>     |

## *Energy and materials*

| Schedule  | Title   | Speaker  |
|-----------|---|--|
| 1340–1420 | <b>Mixed conductors for electrical power applications</b> | <i>U. (Balu) Balachandran<br/>Argonne National Laboratory, USA</i> |
| 1420–1500 | <b>Processing of nanomaterials</b>                        | <i>Pulickel Ajayan<br/>Rensselaer Polytechnic Institute, USA</i>   |
| 1500–1520 | <i>Coffee</i>   |  |
| 1520–1540 |   | Open call for papers   |
| 1540–1600 |   | Open call for papers   |
| 1600–1620 |   | Open call for papers   |
| 1620–1640 |   | Open call for papers   |
| 1640–1700 |   | Open call for papers   |
| 1700–1900 | <b>Poster session</b>                                     |  |
| 1930      | <i>Dinner</i>   |  |

## *ICT and sensores*

| Schedule   | Title   | Speaker  |
|------------|---|--|
| 1340–1420  | <b>Novel methods of structure fabrication and property measurement on the nanoscale</b> | <i>Masakazu Aono<br/>National Institute for Materials Science, Japan</i> |
| 1420–15:00 | <b>The “Millipede” – a nanotechnology approach to data storage</b>                      | <i>Peter Vettiger<br/>IBM Research, Switzerland</i>                      |
| 1500–1520  | <i>Coffee</i>   |  |
| 1520–1540  |   | Open call for papers   |
| 1540–1600  |   | Open call for papers   |
| 1600–1620  |   | Open call for papers   |
| 1620–1640  |   | Open call for papers   |
| 1640–1700  |   | Open call for papers   |

# Tentative program – NANOMAT-Birkeland conference 2005

**Friday June 3**

## *Crossdisciplinary research*

| Schedule  | Title  | Speaker  |
|-----------|--|--|
| 0830–0910 | <b>Nanotechnology and its challenges</b>   | <b>Harald Fuchs</b><br><i>University of Münster, Germany</i> |
| 0910–0950 | <b>Nanotechnology in Europe from an innovation perspective</b>                     | <b>Raymond Oliver</b><br><i>Cenamps, UK</i>                  |
| 0950–1000 | <b>Coffee</b>  |  |
| 1000–1020 | <b>Nanotechnologies – possibilities and challenges seen from an investors view</b> | <b>Oddvard Aaserud</b><br><i>VENTUROS, Norway</i>            |
| 1020–1040 | <b>Smart wear – a new opportunity for Norwegian textile industry?</b>              | <b>Hilde Færevik</b><br><i>SINTEF Health, Norway</i>         |
| 1040–1100 |  | Open call for papers   |
| 1100–1120 |  | Open call for papers   |

## *Nanotechnology research in Europe and Japan*

| Schedule  | Title  | Speaker  |
|-----------|--|--|
| 0830–0910 | <b>Nanotechnology research in Denmark and at the Nano-Science Centre</b>                         | <b>Thomas Bjørnholm</b><br><i>University of Copenhagen, Denmark</i>        |
| 0910–0950 | <b>Nanoscience and Nanotechnology in education and research in Sweden and at Lund University</b> | <b>Lars Samuelson</b><br><i>Lund University, Sweden</i>                    |
| 0950–1000 | <b>Coffee</b>  |  |
| 1000–1040 | <b>Nanotechnology research activities at NTT Basic Research Laboratories</b>                     | <b>Hideaki Takayanagi</b><br><i>NTT Basic Research Laboratories, Japan</i> |
| 1040–1120 | <b>Nanotechnology research in Finland</b>  | <b>Risto Nieminen</b><br><i>Helsinki University of Technology, Finland</i> |

## *Plenary session*

| Schedule  | Title  | Speaker  |
|-----------|--|--|
| 1130–1145 | <b>NANOMAT</b>                               | <b>Bjørn Torger Stokke</b><br><i>Chairman of the NANOMAT Programme Committee</i> |
| 1145–1215 | <b>Ethics and nanotechnology</b>             | <b>Göran Hermerén</b><br><i>Lund University, Sweden</i>                          |
| 1215–1315 | <b>Lunch</b>                                 |  |
| 1315–1415 | <b>The heritage after Kristian Birkeland</b> | <b>Asgeir Brekke</b><br><i>University of Tromsø, Norway</i>                      |
| 1415–1515 | <b>Science as a peacekeeper</b>              | <b>Thorvald Stoltenberg</b><br><i>Norwegian Red Cross</i>                        |
| 1515–1530 | <b>Closing remarks</b>                       | <i>To be announced</i>   |