THE NORWEGIAN ACADEMY
OF SCIENCE AND LETTERS

DRAMMENSVEIEN 78, OSLO
THURSDAY, SEPTEMBER 22, 17:45

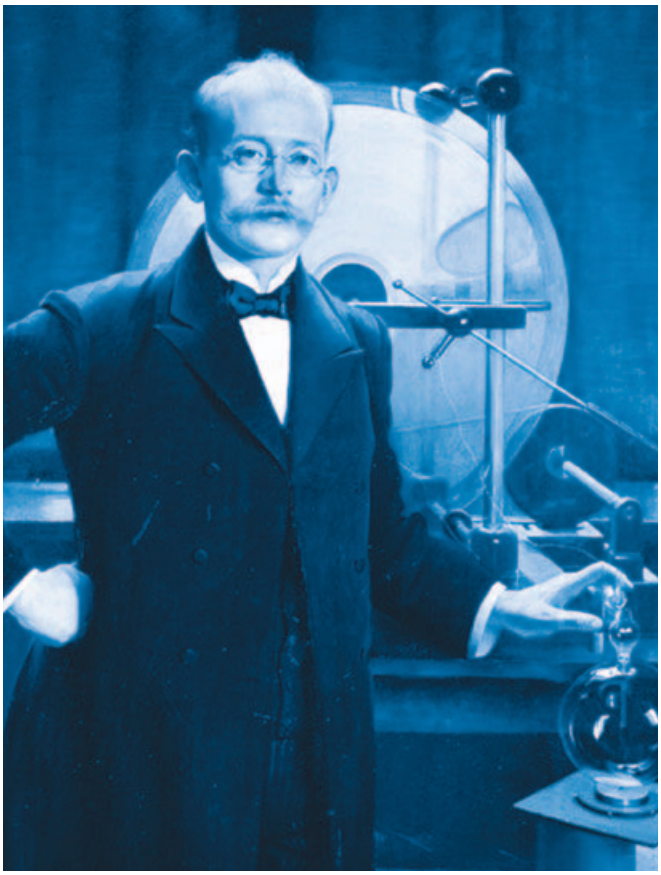
THE BIRKELAND LECTURE 2011

PROF. DR. RYOICHI FUJII
Solar-Terrestrial Environment Laboratory,
Nagoya University, Japan

"Long-lasting Norway-Japan collaboration in solar-terrestrial science"

No registration necessary. Free admission

This portrait of Professor Kristian Birkeland was painted by Asta Nørregaard in 1906. © Norsk Hydro



The Birkeland Lecture 1987-2010

The University of Oslo has since 1987 arranged a "Birkeland Lecture" in cooperation with the Norwegian Academy of Science and Letters, the Norwegian company Norsk Hydro (from 2004 YARA ASA) and the Norwegian Space Centre (from 2005). Except for the year 1993, when the lecture was presented in Tokyo, and in 1998, when a mini-seminar was organized at the Norwegian Embassy in Tokyo, the lectures have been given in Norway, most of them at the Academy's premises in Oslo. Some years seminars have been arranged in connection with the lectures, e.g. in 1993 when the lecture was a part of a "Joint Japanese – Norwegian Workshop on Arctic Research", in 1995 when the lecture was a part of a seminar on Norwegian environmental research, and in 2001 when the lecture was given in connection with a workshop on Norwegian space research, with emphasis on the Cluster satellite programme. This cooperation between the University of Oslo, the Academy, Norsk Hydro/YARA and the Norwegian Space Centre is above all an endeavor to honor the great Norwegian scientist and entrepreneur Kristian Birkeland. However, it has also given the University the opportunity to invite to Oslo many outstanding scientists within the field of geophysical and space research, areas which were central in Kristian Birkeland's own research.

1987: Hannes Alfven , Kungliga Tekniska Høgskolan , Stockholm, Sverige, and University of California, San Diego, USA::
"The Auroral Research in Scandinavia"

1988: Alex J. Dessler , Rice University, Housten, USA:
"I have it" - Birkeland´s quest for research founding"
(University of Oslo, 16. 09 1988)

1989: T.A. Potemra, The John Hopkins University, Laurel, USA:
"Satelite measurements of Birkeland currents"
and
Naoshi Fukushima, Tokyo University, Japan:
"Birkeland´s work with the geomagnetic disturbances in relation to modern research"

1990: James van Allen , University of Iowa, USA:
"On the future of space science and applications"

1991: Syun-Ichi Akasofu , Geophysical Institute, Fairbanks, Alaska:
"Helio-magnetism"

1992: W. Ian Axford , Max-Planck Institut, Lindauer, Tyskland:
"The origin of cosmic rays"

1993: Takasi Oguti, Solar-Terrestrial Environment Laboratory, Tokyo, Japan:
"Sun-earth energy transfer"

1994: Stanley W.H. Cowley, Imperial College, UK:
"The Solar wind – Magnetosphere-Ionosphere connection"

1995: Anthony L. Peratt, Los Alamos National Laboratory, USA:
"The legacy of Birkeland´s plasma torch"

1996: Gerard Haerendel, Max Planck Institute, Garching, Tyskland:
"Physics along auroral magnetic field lines"

1998: No lecture, but a ***"Birkeland event"*** at Tokyo University 30. 09 with presentation of a Birkeland bust to Tokyo University, and a mini-seminar at the Norwegian Embassy.

2001: David Southwood, Imperial College, London /
Director of Research ESA, Paris:
"Kristian Birkeland, Science Forever, Lessons for Today"

2002: Alain F. Roux, Centre dÈtude des Env. Terrestres et Planetaires, CETP, Paris:
"Role of Kristian Birkeland curents in the dynamics of the geomagnetic tail"

2003: Lev M Zelenyi, Space Research Institute, IKI, Moscow, Russia:
"Space Weather"

2004: Catherine G. Coleman, NASA, Houston, USA:
"Our Earth seen from Space"

2005: Wiliam J. Burke, Air Force Geophysics Laboratory, USA:
"Kristian Birkelands Message from the Sun – Its meaning then and now"

2006: Margaret Kivelson, University of California, Los Angeles (UCLA), USA:
"A century after Birkeland: Auroras and related phenomena at moons and planets"

2007: Eigil Friis-Christensen, Danish National Space Center (DTU)
"Unrest on the Sun – storms on the Earth. The magnetic connection"

2008 Franz-Josef Lübken, Leibniz-Institut für Atmosphärenphysik, Kühlungsborn, Germany
"Dramatic climate changes in the upper atmosphere"

2009 Paul M. Kintner, Jr, School of Electric and Computer Engineering, Cornell University, Ithaca, NY, USA
"Extreme space weather"

2010 Christer Fuglesang,
Science and Application Division, Human Space Flight Directorate, European Space Agency (ESA)
"Voyages to the International Space Station"
– a marvellous platform for research and future space exploration.

Prof. Dr. Ryoichi Fujii,
Solar-Terrestrial Environment Laboratory, Nagoya University, Japan

"Long-lasting Norway-Japan collaboration in solar-terrestrial science"

Scientific exchange between Norway and Japan started in the beginning of the 20th century. Around that time a genius physicist, Professor Kristian Birkeland, visited his colleagues at the University of Tokyo, Japan, where he died unanticipated in 1917.

Since the 1970s, Norway-Japan collaboration in solar-terrestrial science has been enhanced through ground-based and rocket-borne auroral observations in mainland Norway and Svalbard. The ionosphere/thermosphere is the outermost portion of the Earth's atmosphere and partially ionized. Connected to the fully ionized magnetosphere through magnetic field lines is the polar ionosphere, where several spectacular physical phenomena including auroras, appear. Currents flowing along the magnetic field lines play a key role in the magnetosphere-ionosphere coupling. They were first proposed by Birkeland, more than 60 years before they were first observed with satellites in the 1960s. In addition to being the basis of fundamental auroral plasma physics, the research of the ionosphere-thermosphere-magnetosphere coupling is important for understanding environmental issues such as global warming and space weather.

The European Incoherent Scatter (EISCAT) radar system in northern Scandinavia has been a central tool to investigate the polar upper atmosphere. EISCAT consists of very powerful incoherent scatter radars with supplemental ionospheric heating facilities. EISCAT has been getting more comprehensive with complementary state-of-the art equipments, such as the recent Japanese installation of a sodium lidar at Tromsø. Furthermore, EISCAT plans to construct a new three-dimensional imaging radar, called EISCAT-3D, to make spatially and temporarily continuous measurements of the geospace environment and its coupling to the Earth's atmosphere. This new facility will certainly be the most powerful incoherent scatter radar for polar upper atmospheric and space research in the world, and will contribute to innovative progress in solar-terrestrial science.

Yara's Birkeland Prize in Physics and Chemistry

Yara's Birkeland Prize in Physics and Chemistry will be awarded to a Ph. D. candidate from a Norwegian university who has carried out a scientific study that is in accordance with the innovative spirit of Kristian Birkeland. The prize will focus on the environment and technology, and encourage research across the traditional borders. The prize will alternate between physics and chemistry, with chemistry in years with odd numbers and physics in years with even numbers.

The award ceremony will take place in connection with the Birkeland lecture. The prize was awarded for the first time in 2009.

Professsor Dr. Ryoichi Fujii, SOLAR-TERRESTRIAL ENVIRONMENT LABORATORY, NAGOYA UNIVERSITY, JAPAN

Born in Kamakura, Kanagawa, Japan.
Dr. Fuchii earned the degree Master of Science at the University of Tokyo, Japan, in 1976, and the degree Doctor of Science at the same university in 1981.
He started his academic career in 1977 as a Research Associate at the National Institute of Polar Research. In 1992 he became Associate Professor at Nagoya University, and full professor at the same university in 1995. From 2005 to 2009 he was Director of Solar Terrestrial Environment Laboratory, Nagoya University, and from 2009 to present he has served as Trustee and Vice-president of Nagoya University. Dr. Fujii was NRC Research Associate at NASA/Goddard Space Flight Center 1987-88, Visiting Associate Professor, Institute of Space and Astronautical Science, 1993–95, and Visiting Professor, Institute of Space and Astronautical Science, 1995–99. He was Member of the Japanese Antarctic Research Expedition 1981-83 and 1990-92. He is a member of the Society of Geomagnetism and Earth, Planetary and Space Sciences of Japan, The Japanese Society for Planetary Sciences, and the American Geophysical Union. He received the Tanakadate Medal, Society of Geomagnetism and Earth, Planetary and Space Sciences of Japan in 1993. He is a member of the Norwegian Academy of Science and Letters. Dr Fujii has been a member of numerous scientific committees and councils, to be mentioned are the EISCAT Scientific Advisory Committee, the Ionosphere Special Committee, Science Council of Japan, the Council of the EISCAT Scientific Association, (Chairperson 2003-2004), Bureau member of SCOSTEP under ICSU, the Advisory Board of Research Institute for Sustainable Humanosphere of Kyoto University, the Society of Geomagnetism and Earth, Planetary and Space Sciences of Japan, (President: 2003 – 2005) Science Council of Japan, the Advisory Council for Research and Management of Institute of Space and Astronautical Science of Japan, Aerospace Exploration Agency, the Advisory Board of National Institute of Polar Research.
His main scientific interests at present cover Solar Wind-Magnetosphere interactions, Magnetosphere-Ionosphere-Thermosphere coupling, and Planetary Ionospheres and Magnetospheres. He has been a driving force in the Japanese participation in the EISCAT international research activities.

Organizing committee:

Professor Jan A. Holtet, Department of Physics, University of Oslo
Professor Alv Egeland, Department of Physics, University of Oslo
Øyvind Sørensen, Chief Executive, the Norwegian Academy of Science and Letters
Rune Ingels, Yara International ASA
Bo Andersen, Director General, Norwegian Space Centre

The Birkeland Lecture is open for everybody. There is no registration. Free admission.

For more information about the Birkeland Lecture 2011:
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YARA