transatlantic science week

bridging partnerships

conference report

november 12-16 2012, houston, tx

NORWEGIAN CONSULATE GENERAL

Houston

foreword

This report summarizes the thematic contents and essential outcomes of the TSW12 sessions, panels and workshops. Furthermore, the report extrapolates the most concrete leads and suggestions for collaborative follow-up, underscoring the overarching goal of the Conference, that of "Bridging Partnerships".

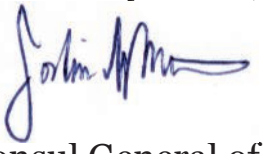
Closely linked to this conference summary, is the NorTex report, which was prepared just in advance of TSW12, and which has since been further developed in the light of follow-up measures already taken in the wake of the conference. The NorTex Report explores the feasibility of establishing a new and exciting science, technology and innovation partnership between Texas and Norway. Hence, we recommend that the TSW12 conference report and the NorTex report should be read in close conjunction with each other.

We are very pleased to report that several concrete, collaborative follow-up initiatives are already in process following TSW12. These include the recent formation of a NorTex Petroleum Cluster involving several universities in Texas and Norway. Other examples include new collaborations in nanotechnology, climate science, energy & space research, as well as in cancer and cardiology research.

I wish to thank the great number of individuals who have contributed to both reports, not least the chairs of the many conference sessions, and those who contributed to the NorTex Report. Special thanks are due to May Akrawi, Ph.D., President, ST&I Policy Advisors, LLC, Houston, who has superbly authored both reports.

Houston, March 20, 2013

Jostein Mykletun, Ph.D.



Consul General of Norway, Houston

welcome greetings

I am pleased to welcome you to Transatlantic Science Week 2012. As our theme this year is "Bridging Partnerships," I hope you will find that this year's conference fills you with inspiration and provides many fruitful opportunities for future scientific collaboration.

In 2001, the Norwegian Government decided to strengthen its bonds across the Atlantic with a new initiative: the Royal Norwegian Embassies in Washington, D.C. and Ottawa were charged with establishing Research and Technology Forums, which would bring Norwegian and North American scientists together to meet, collaborate, and share ideas. A bilateral agreement for cooperation in science and technology between Norway and the United States was signed in 2005.

Those forums have since evolved into Transatlantic Science Week. This year marks the first time the event has been held in Houston, and we are excited to be able to take advantage of the wonderful research and scientific facilities this area offers, much as we were able to tap into the resources of UC Berkeley, Stanford University, and Silicon Valley last year.

The goal of Transatlantic Science Week is to enhance transatlantic cooperation in research, innovation and higher education. We aim to facilitate and increase cooperation between Norway and North America and to put bilateral agreements on science and technology cooperation to work. We want to further develop a vibrant transatlantic arena to showcase and promote Norwegian research and innovation, while encouraging collaborative activities. We encourage dialogue among policy makers, innovators, educators, and researchers. To that end, we also invite participants from other countries who take an interest in this sort of transatlantic effort, recognizing that science, innovation and entrepreneurship are essentially borderless.

Together with the Royal Norwegian Consulate General in Houston, which helped organize this terrific event, I look forward to exciting and rewarding transatlantic science days in Houston!

Wegger Chr. Strommen

Ambassador of Norway to the United States

On behalf of the Royal Norwegian Consulate in Houston, I warmly welcome the well over 500 participants to the 11th Transatlantic Science Week. We are very proud to have Rice University and The University of Texas MD Anderson Cancer Center as our two principal partnering venues – together they form our TSW12 "Dream Team" in Houston.

Houston being the Worlds' Energy Capital, makes it natural to have energy as one central TSW12 focus area, with specialized workshops on energy, security and supply, drilling and deep water technology, synergies between space and offshore exploration, sharing environmental data in the Arctic, and conveying climate science to the public.

Houston is also the Medical Capital of the World, which explains why the second main focus of TSW12 is health and medicine. Central topics include research on global governance for health, health professionals for a new century, palliative medicine, cardiology, hypoxia and cancer. Other central features of TSW12 include nano enabling technologies, emerging technologies and commercialization, research-based education, innovation, and tech transfer. There will be a special Fulbright Session on Arctic Research, and the annual TSW Kavli Laureate Lecture. Another exiting new element for this year's TSW is the inclusion of a comprehensive student program in petroleum related subjects.

TSW12 offers a variety of optional special events, with visits to University of Houston, Texas A&M at College Station, NASA, and Schlumberger.

For me personally, it is a gratifying opportunity to host the 11th TSW, which I had the distinct privilege to help launch during my tenure (2001-2005) at the Royal Norwegian Embassy in Washington, D.C. I wish to take this opportunity to thank our great public and private partnering colleagues in Houston, Washington, D.C., and in Norway. Not the least, I want to thank the small but totally committed TSW12 staff at Norway House in Houston. Welcome to Houston!

Jostein Mykletun, Ph.D

Consul General of Norway, Houston

welcome greetings

I am proud to be the first Norwegian Minister of Health and Care Services to participate in the Transatlantic Science Week. On behalf of the Norwegian delegation on health, I would like to send my warm congratulations to the organizers and a very warm welcome to all the participants. A special thanks to the Royal Norwegian Consulate General, Rice University, MD Anderson Cancer Centre and the participants from the Norwegian reference group. We are delighted to host the first Transatlantic Science Week in Texas, in the midst of the largest medical centre in the world.

Transatlantic Science Week has grown to become a keystone for scientific collaboration between the US and Norway in science, technology, and innovation. Last year marked a decade of this distinguished annual event which has initiated several high-level transatlantic partnerships between key stakeholders in research, innovation and education.

The focus this year is on medicine and health. It offers great opportunities for bridging knowledge and best practice across national boundaries. Being a venue for discussion, I hope that the conference may foster new partnerships along the value chain of basic research, innovation, translation, commercialization and uptake of new knowledge from bench to bedside. This is our shared vision.

Norway has a strong tradition in health research. National priorities include research to ensure quality, effectiveness and patient safety. By the end of this year the Norwegian Government will present two White Papers. The first covering quality and patient safety, and the second on information technology within the health sector. In 2013 a White Paper on Innovation in Care Service will be presented.

Finally, I would like to wish you a productive and stimulating conference, with the ability to create new collaborations and strengthen existing ones between our two nations.

Jonas Gahr Støre,

Minister of Health and Care Services

Dear Transatlantic Science Week Participant,

Welcome to the Transatlantic Science Week! I am very excited to be here in Houston, a key global hub for American-Norwegian cooperation. There are long historic ties between Norway and North America, and especially Texas.

The annual Transatlantic Science Week is an event that we take great pride in, and our expectations for this week are high. The Ministry of Education and Research funds this event every year, because we truly believe it is an important arena for our brightest and best to meet to discuss and exchange ideas on education and research and further develop the relations between our countries. This year's event is definitely no exception, with its large variety of topics, themes and visitors' offsite programs.

Also, this year's theme "Bridging Partnerships" outlines some of our most exciting areas of cooperation, which are fundamental to meeting our common challenges, and building our future: Energy and Health. Innovation and higher education are key. It is fundamental for research, innovation and higher education to work together and be interlinked, internationally – and locally. I am especially pleased to notice the Ph.D. student program that has been introduced for a first time during TSW as they are our future, and hope to see many prospective researchers and innovators at the Transatlantic Science Week in the future.

The co-hosts of this year's Transatlantic Science Week are showcases of academic excellence, of innovation and research based higher education. We are fortunate to have such vital partners as Rice University and MD Anderson Cancer Center, who together with the Consul General's hard work and inspiration have created this event for us. Finally, without the efforts of the many chairs and speakers of the Transatlantic Science Week 2012 we would not have such a diverse and interesting program.

I hope you will all make the most of this week, and that we will see you again, next year, in Washington D.C.

Kristin Halvorsen

Minister of Education and Research

welcome greetings

Dear Participants in Transatlantic Science Week 2012,

Welcome to Houston and to Rice University! We are very pleased to welcome so many guests to the Rice campus for these days of panel discussions, plenary sessions and other interactions between specialists in science, medicine, public policy, as well as the many government officials and university leaders. Transatlantic Science Week 2012 is an extraordinary opportunity for Rice University and our colleagues from the Texas Medical Center to engage Norwegian institutions in a focused and productive way, and I look forward to hearing about the results of this week's meetings.

I also want to thank the Royal Norwegian Consulate General of Houston, headed by Consul General Jostein Mykletun, which has taken the lead in putting this extraordinary series of events together. Consul General Mykletun, along with many collaborators at Rice, MD Anderson and other TMC institutions, has brought together a spectacular group of people, and I am very grateful.

We hope the conference will contribute to a continuing strengthening of the research relationships between Norway and the United States.

Please let us know if there is anything we can do to make your stay at Rice more enjoyable. Both our staff and the volunteers supporting the events on our campus will be happy to assist you with any questions or needs that you may have.

We wish you a pleasant and successful stay in Houston and hope to see you on the Rice campus again in the very near future.

Warm regards,

David W. Leebron

David W. Leebron
President, Rice University

Dear Colleagues,

I would like to personally welcome you to Houston for Transatlantic Science Week. The University of Texas MD Anderson Cancer Center is proud to co-host the event with our distinguished colleagues at Rice University.

As many of you know, we already have a number of fruitful collaborations with Norway through our sister institution relationship with the Norwegian Cancer Consortium. I'm confident this event will strengthen existing ties and foster new research collaboration not only between MD Anderson and our partners in Norway but also among the institutions in the Texas Medical Center and throughout the United States — and particularly among the participants from academia, research institutions, industry, and government from Norway.

The program has been designed to share knowledge across areas of research interest and to allow time for discussion both at the meeting and during social events. I hope you will take full advantage of the program and develop relationships that will endure well beyond the event.

Best regards,

Ronald A. DePinho, M.D.
President
The University of Texas MD Anderson Cancer Center

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Thursday, November 15, 2012

Friday, November 16, 2012

background

The Royal Norwegian Consulate General Houston organized the 11th annual Transatlantic Science Week (TSW12) in Houston on November 12-16, 2012. The conference was a co-organized with the Norwegian Embassy in Washington, Rice University and the University of Texas MD Anderson Cancer Center with the workshops held at both university locations. TSW12 was the largest of its kind so far. It involved 600 participants, with a 200 strong delegation from Norway that included 5 University Rectors and 20 Deans from the most distinguished Norwegian universities. In addition, the program brought to Houston the Norwegian Ambassador to the United States, Wegger Strømmen, and the US Ambassador to Norway, Barry White, as well as two Senior Cabinet Ministers from Norway, Kristin Halvorsen, Minister of Education and Research, and Jonas Gahr Støre, Minister of Health and Care Services. Furthermore, TSW12 also included a workshop for PhD students, on petroleum engineering. The main focus of the conference was to create Transatlantic Bridging Partnerships across the fields of Healthcare, Medicine, Energy, Innovation, Public Policy and higher education.

To prepare for this, the Norwegian Consulate General in Houston commissioned a pilot study, in advance of TSW12, to explore the feasibility of establishing a new and exciting science, technology and innovation partnership between the North Star and Lone Star States. This partnership, coined **NorTex**, proposed the creation of a public private partnership between academic institutions in Texas and Norway, including universities and companies in energy, biomedicine and healthcare technologies. This initiative would focus on bridging transatlantic partnerships through joint research projects and the joint development and commercialization of novel and disruptive multi-disciplinary technologies to solve some of the most challenging issues in Energy and Healthcare. NorTex would build on some of the key discussions and outcomes of TSW12, which was especially designed to focus on some of the unique world-class multidisciplinary and innovative research based technologies in Texas that are of interest to Norway.

NorTex aims to encompass science and technology venture events, entrepreneurship programs, and exchange of students, scientists, health specialists, and engineers, as a means to delivering its goals. It is proposed that NorTex would be jointly funded by the Government (centrally, possibly also regionally) of Norway and commercial partners in Texas and Norway.

Monday 12th November:

Preconference workshop on Sharing Environmental Data Across Boundaries in the Arctic

Co-chairs: Robert Detrick, PhD, NOAA, Assistant Administrator for Oceanic and Atmospheric Research and Vidar Hepsø, PhD, Statoil R&D, Project Manager, Integrated Environmental Monitoring Program.

Topics discussed included:

- **Change in focus of data/research**: the last few decades have focused attention on the impact of climate change on the arctic region but this needs to be refocused from cause/effect activities to studying system-based problems and better use of resources to best tackle the enormous challenges ahead.
- **Data validity:** greater scrutiny of the type of data captured and its potential use. Data needs to be coupled to ensure system understanding.
- **Data availability:** data sharing needs to be widened across international partners and differing policies and regulations between governments, industry and NGOs overcome. Letting go of data ownership and thinking collaboratively is the way forward.
- **Consolidation of data:** varying data sets from different users need to be consolidated and made more accessible to a broader community. Data needs to be first catalogued and then integrated and partners adhere to common (agreed upon) standards). Setting up a task force to oversee this was recommended.
- **Abuse of technologies**: concerns that data capturing by some entities (private or government) could be used for surveillance.

Outcomes and follow up actions:

Statoil RDI and NOAA will continue to collaborate on the following targeted activities and develop a plan of work for 2103:

- **Ocean Observations Data Management and Sharing:** Integration and analysis of observations. Address obstacles or challenges for successful sharing of real time environmental data across national boundaries and between different scientific domains. Develop data governance mechanisms for these data.
- **Lofoten Cabled observatory & Sensors:** Share information on best practices and design guidelines on mooring deployment and maintenance of cabled and moored sensors. Consider the LOVE observatory as a test bed for new technologies and sensors.
- **Ecosystem modeling and oil spill response:** Develop links among experts on Algorithm sharing and model sharing and implementation.

A conference will be held at the University in Tromsø in 2013, hosted by Rector Jarle Aarbakke to further elaborate on some of the challenges addressed in the TSW12 workshop.

Pre-conference workshop on Global Governance for Health

Co-Chairs: *Ole Petter Ottersen, Rector, University of Oslo and Dr. Bobby Kapur, Director, Center for Globalization, Baylor College of Medicine, Houston*

The Commission on Global Governance for Health - an initiative of Lancet, Harvard University and the University of Oslo - wishes to positively influence policy and decision-making in the global health system. In his talk, the Chair of the Commission, Ole Petter Ottersen, emphasized how gaps in and challenges of global governance, influence the distribution of resources and money and how actors and forces outside the global health system profoundly impact the well being of populations the world over.

In the debate and comments to the issue, it was emphasized that two of the greatest challenges to health are:

1. The unequal distribution of knowledge due to the lack of higher education in the developing world as well as limited knowledge and evidence guiding health interventions.

2. Failure to acknowledge that sustainable health environments can be achieved only by working from local communities Shortcomings of global governance include its democratic deficit and it distance to the people.

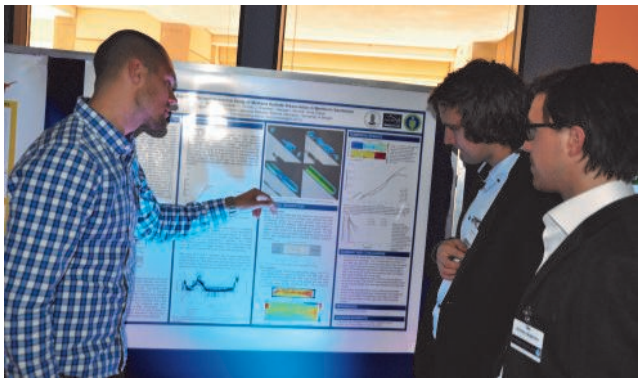
The commission drew comments from The US Ambassador to Norway, Mr. Barry White, who clarified the US contemporary Global health policy to the audience. The ambassador pointed to the increasing global health policy space within individual nations states like the US. The timing of the commission was considered opportune.

The critical factors in making global governance processes more health sensitive were discussed at length. Clarity and understanding of new science and technologies addressing global challenges is crucial for leaders to formulate and implement sound public polices.

The workshop met the principal objective about informing about the Commission's work, and received valued input in fulfilling its mandate - reporting to the UN General Assembly in September 2013.

PhD Student Petroleum Science and Technology Workshop – and Poster Session:

Co-Chairs*: Arne Graue, Professor, University of Bergen and* Alan Levander, *Carey Croneis Professor and Department Chair, Department of Earth Science, Rice University*



*PhD students at the workshop**

The PhD Student Petroleum Science and Technology Workshop gathered around 70 students (30 from 4 universities in Norway and 40 from 4 universities in Texas). The workshop demonstrated several common research interests on exploration, drilling, and reservoir characterization for EOR; also exhibiting complementary research activities trigging active discussions in particular on unconventional energy resources. Specifically, a promotion on student exchange was initiated by the Petroleum Research School of Norway (NFiP), where each of the collaborating universities will be asked provide a 3 months collaborative research project where students from Norway or the USA, respectively, will participate in as exchange students; financed by NFiP. Related to the student session, an MoU between the University of Texas at Austin and the Petroleum Research School of Norway was signed during a ceremony where the Minister of Research and Education in Norway was present.

Tuesday 13th November:

The Opening Plenary Session

Co-chairs: *Wegger Strømmen, Norway's Ambassador to the U.S., and Prof. Neal Lane, Senior Fellow in Science and Technology policy, Baker Institute for Public Policy, Rice University.*

The session was initiated by a welcome address from the Rice University President, David Leebron. He highlighted the role of energy in bringing together Houston (the energy capital of the world) with Norway, a leading nation in the energy industry. Being an energy capital nowadays also makes Houston a 'technology capital', due to the high-tech nature of the energy industry. Healthcare is also a strong area of partnership with Norway. Houston is home to the world's largest medical center, The Texas Medical Center, which ranks as the 8th largest downtown area within US cities. It houses 54 institutions, 92500 employees and sees around 7 million patients a year. Houston is keen to partner with Norway's leading medical institutions, and Leebron mentioned Norway's remarkable cancer database as one of the many reasons. He reminded the audience of how the discovery of the C60 (Buckyball) at rice spawned the field of Nanotechnology and that such life changing curiosity driven research is essential to support. He concluded, with emphasis, that TSW12 was not just about advancing knowledge but also advancing relationships and bridging partnerships.

*Minister of Education and Research Kristin Halvorsen**

The Norwegian Minister for Education and Research, Kristin Halvorsen, was next and she stressed the importance of Transatlantic Science Week in fostering new links and strengthening existing academic relations between Norway and Norway's important partners in North America. The challenges we are facing are global and she emphasized that research and collaboration are essential if we are to understand and resolve these challenges. The full text of her speech can be accessed via this link.

Dr. Subra Suresh, Director of the National Science Foundation (NSF) in the USA, gave the next talk at the plenary session and a special lunch presentation at the Baker Institute for public policy at Rice University, as part of the 'civic scientist' program, led by Prof. Neal Lane. He outlined how innovation from science and engineering research is necessary for the success of a nation. Basic research is important and should be funded by government and carried out at academic institutions, to give researchers the scientific freedom to carry out 'curiosity driven' research, without the pressure to justify its commercial applications. He gave the example of how NSF funded the basic research that led to 'Google', based on page ranking technology. The NSF's current budget is $7 billion and funds about 300,000 projects for research as well as science communication and public outreach via museums and the media. In fact, 70 % of the U.S. Nobel Laureates have been funded by the NSF. The agency is also fostering innovation via its Innovation Corps (I-Corps) program to speed up the development and translation of research from the laboratory to the marketplace. He outlined the need for global solutions to the current global challenges where observation facilities and 'Big Data' are crucial areas for international collaboration on climate science, space, physics, Genomics to name but a few disciplines. A webcast of Dr. Suresh's lunchtime presentation at the Baker Institute is available.

*Dr. Subra Suresh, Director of the National Science Foundation**

*Arvid Hallén**

Next was Arvid Hallén, Director General of The Research Council of Norway, who outlined how new technologies could offer solutions to the global energy and climate challenges. He also stressed the importance of international collaboration and mentioned that Norway has seen the largest increase in international collaborations with North American researchers, as evidenced by the increase in joint publications. Norwegian researchers publish their highest number of papers and those that have the highest impact in the area of geosciences. Norway is also proud of being the Number one on the United Nations' development index and is an international leader in the role of women and gender equality. One of the best ways to connect with the top Norwegian experts is via the Centers of Excellence (CoE) funded by the Research Council of Norway. These centers have been instrumental in increasing Norway's science impact and are centers of innovative research that have strong ties to industry. Hallén also went on to mention the Norway's strengths in the medical research, including neurosciences, cardiovascular disease, respiratory diseases, inflammation, cancer, rheumotology and orthopaedics. Norway has a unique Biobank, which includes data from 500,000 patients. This is a valuable resource for cutting edge international projects. Norway is of course well known as a technology leader in petroleum engineering, especially in subsea exploration and enhanced oil recovery as well as being one of the cleanest petroleum producers. He ended by reminding the audience how Houston based companies, like Halliburton's KBR, were pioneers in exploiting North Sea resources, just as Norwegian technology is essential for the Oil and Gas industry in the Gulf of Mexico.

Ambassador Edward P. Djerijian, Founding Director of the James A. Baker Institute for Public Policy, presented next, on The Geopolitics of Oil and Gas. He opened with an overview of world energy outlook, outlining a 2.5% rise in worldwide energy consumption in 2011, 85% of which was in emerging economies and in the Middle East. In contrast, energy demand dropped in OECD countries. Saudi Arabia still has the largest reserves and 12.5 million barrels a day in production capacity. He also explained that 80% of known worldwide reserves are controlled by National Oil Companies (NOCs), which represent 75% of the world's largest oil companies. However, Independent Oil Companies (IOCs) have an important role to play in developing technology and compliment the role of NOCs. He cited Pemex in Mexico, as an example of an NOC that has not been successful in exploiting the country's resources, without partnerships with IOCs that would lead to improving their technology. Unconventional sources like Shale Oil and Gas, heavy oil and Deep-water drilling are factors that have influenced the energy balance throughout the last few years. The role of technology in developing the 'shale gas revolution' has been significant, especially improvements in drilling, hydraulic fracturing and horizontal drilling. He also cited the importance of stability in the Middle East in the Geopolitics of Oil, as 20% of the world's oil passes through the Straights of Hormuz. Japan, for example, imports 75% of its oil from the Persian Gulf region. Even a temporary closure of this important region could 'spook' energy markets and hike up the price of oil. He also addressed the impacts of the Arab Spring (or Awakening, as he termed it) and its implications on the geopolitics of energy and the importance of Arab governments investing in education and the training and role its younger citizens, especially women. Unemployment, especially in the under 25, is double the global average, with an extremely high level of lliteracy, especially in women. Investment in education is also very low. All of these factors, as well as the lack of basic human rights, he believes, contributed to the Arab awakening. He pointed out the futility in using US military power and funding to stabilize Arab regimes, when they may crumble from within. There are also new challenges as a result of this awakening, with new groups coming into power, who have no experience in government.

The audience at Rice University during the opening plenary session

The other area he covered was the shift in the energy geopolitics in the Western Hemisphere, with large deposits of oil and gas discovered in Brazil as well as large reserves in Venezuela and Columbia. A modernized Mexico could also play a role in the future, as well as Shale in the US and Tar sands in Canada. These discoveries will make the Western Hemisphere truly energy secure, he added, with implications beyond just the energy sector. This will also affect the foreign policy of future administrations, who will not be as dependent on the Middle East for their energy resources. In spite of this, he concluded that the Middle East will still remain an extremely important factor in the geopolitics of energy, especially Iran, Saudi Arabia, Iraq and Qatar, but with a different scenario in play.

Robert Detrick speaking at the opening plenary session

Robert Detrick, Assistant Administrator for Oceanic and Atmospheric Research at the National Oceanic and Atmospheric Administration (NOAA), followed**.** His presentation focused on the importance of monitoring the Arctic region and the dramatic changes already noted, including temperatures, sea ice retreat, ecosystems, ocean acidification and permafrost warming. There are large amounts of untapped hydrocarbon reserves (30% of the world's natural gas and 13% of undiscovered oil) but the Artic environment presents challenges for exploration, is seasonally dependent and very expensive to work in. NOAA published its Artic vision and strategy in 2011.

There are challenges in the Artic to all types of traditional monitoring technology (e.g. satellites, ships, moorings). Emerging technologies, such as Gliders, Drifter, animal born sensors and UAVs and AUVs will revolutionize our ability to work in the Arctic. In addition, a seabed based fiber optic network will provide real-time high bandwidth access to data on shore, as well as mounting automated on commercial vessels, for observation. Data management will remain an issue (as addressed in the Arctic data workshop earlier). The problem is the amount and also the heterogeneity of the data. He concluded that effective partnerships between the eight nations of the Arctic basin are extremely important, as well as collaborations between government/academia and industry, under the Arctic council umbrella. NOAA has existing MoUs with Statoil, Conoco and Shell to exchange environmental data and an agreement with Statoil to develop cable observation technology.

Speakers at the Climate Science Workshop

Dr. Vicki Colvin, Vice Provost for Research and Professor, Chemical and Bio-molecular Engineering, Rice University, gave the next talk, focused on Rice's innovative use of Nanosciences to tackle the most pressing energy and environmental challenges. The late Nobel Laureate, Prof. Richard Smalley, laid the groundwork for this area of research with his vision, which has now been refined by two decades of research. The reality is that hydrocarbons will be part of our global energy future for at least 50 years and she emphasized the need to reduce their environmental impact as well as achieve energy security. Rice has focused on both areas, especially with the new Energy and Environment Initiative (E^2I). Rice is focusing on CCS, energy efficiency as well as practical and innovative policy solutions. She also outlined dye-doped solar cell technologies as well as energy storage. Rice is also working on the food-energy nexus with research on optimizing crop production by making soil drought resistant.

The next presenter was Ove Flataker, Director General, Norwegian Ministry of Petroleum and Energy, who outlined the importance of natural gas in Norway's low emission energy future and how the development of CCS technologies will make it an even 'cleaner' technology. Norway has progressive policies on carbon emissions, with a price on carbon and focus on improving low emission technologies. Norway has one of the lowest emissions in the world for production of its oil resources. There is even an agreement between parliament and industry to double CO2 tax.

TSW12 Civic Scientist Lecture

Keynote Speaker: *Dr. Subra Suresh, Director, National Science Foundation, and introduction by Neal Lane, Senior Fellow in Science and Technology policy, Baker Institute*

*At the TSW12 Civic Scientist Lecture at the Baker Institue, Rice University***

*Dr. Subra Suresh, NSF Director, and Dr. Neal Lane, former NSF Director, now at Baker Institute***

Workshop: Energy Technology

***Co-Chairs**: George Hirasaki, Professor, Rice University and Arne Graue, Professor, University of Bergen*

The session on Energy Technology gathered ca. 150 participants from universities and petroleum industry in the USA and Norway. The first part of the session; Energy Outlook and Technology Trends, emphasized the future energy portfolio, with special attention to unconventional resources. The second part; Reserve Growth: Increased Recovery and Unconventional Energy, highlighted specific emerging technologies within seismic reservoir characterization, use of CO2 in EOR and hydraulic fracturing in shales. The discussions during the session on energy technology emphasized the need for closer collaboration between industry and academia. A direct follow up of this session led to a proposal for a NorTex Petroleum Cluster consisting of an initiative relative to the stakeholders benefitting closer collaboration between Norway and Texas within EOR and Petroleum Research in general.

*Professor Arne Graue to the right (University of Bergen) and Professor Alan Levander (Rice) facing PhD student Kanokwan Kullawan from the University of Stavanger**

Workshop: Conveying Climate Science to the Public

***Co-Chairs**: Knut Helland, Professor, Dean, University of Bergen, and John B. Anderson, Professor, Rice University and John B Anderson, W. Maurice Ewing Professor in Oceanography, Rice University*

The workshop addressed a range of issues on the challenge of communicating scientific knowledge on climate change to the public. The role of language in scientific communication was emphasized. Challenges in

communication of data on the actual effects of climate change were addressed as very important for building public trust in climate science. Examples from the Pacific area showed how the livelihood of people is closely intertwined with changes in climate. It was argued that the knowledge of how people understand and respond to climate change is a key to communicate information on climate change on a wider scale. With reference to the Norwegian context, the media's representation of climate change and the popular conceptualization of climate issues were discussed. Models measuring climate skepticism were discussed and it was argued that communication of climate science could be based on this type of research. The impasse in the US public and political debate of actions to combat climate change was discussed and the challenge of moving from scientific consensus to political decisions was addressed. One presentation explained the challenge of communicating science to politicians and other decision makers and argued that communication must be improved. The seven presentations showed a range of challenges in conveying climate science to the public but also strategies for better communication of information on causes of climate change.

Footprints:

- The importance of social sciences and humanities in addressing global challenges was clearly demonstrated at Transatlantic Science Week.
- Faculty of Social Sciences, University of Bergen has established a close collaboration with John B. Anderson, Rice University
- Faculty of Social Sciences, University of Bergen and School of Social Sciences, Rice University have established contact and both institutions are committed to extending the collaboration.
- Department of Social Anthropology, University of Bergen has established contact with its counterpart at Rice University and expect to establish collaboration.

Workshop: Nano-Enabling Technologies

***Co-Chairs**: Daniel Mittleman, Professor, Interim Faculty Director, Smalley Institute, Rice University, and Anne Kjersti Fahlvik, Director, The Research Council of Norway*

Presentations and discussions through the workshop unveiled the potential for more collaboration between researchers from Rice and Norwegian Nano technologists in the years to come, especially in graphene research. There was a clear message to scientists to use existing funding possibilities for transatlantic cooperation, as there are several to enable mobility and joint projects as listed below:

- Norway is participant in EUs framework programs, including the ERA NETs. M.ERA.NET and is currently in discussions with the NSF to establish arrangements for U.S. scientists to participate. Focus of the ERA.NET is materials and nanotechnology. This funding scheme can provide good opportunities for more cooperation between Norwegian researchers and colleagues at Rice. The NSF have been invited to join and will hopefully, be able to organize participation for U.S. scientists in the 2013 call. See information on enclosed link https://www.m-era.net/call2012
- Norwegian research projects, the scientists are always encouraged to include international project participation. In the project, it is entirely legitimate to add charges to guest visit by U.S. scientists to Norway and Norwegian researchers to the U.S. and Texas. We propose mobility of researchers between our two countries utilizing this funding possibility.
- U.S and Norwegian scientist have previously collaborated on projects. U.S. scientists have been reimbursed by NSF and Norwegian researchers by the Research Council of Norway. This procedure requires co-ordination on content and timing of funding calls, between NSF and Norway and should be used more actively by scientist. At the Norwegian side the program of choice in the Research Council of Norway's NANO2021.

Workshop: Health Professionals in a New Century

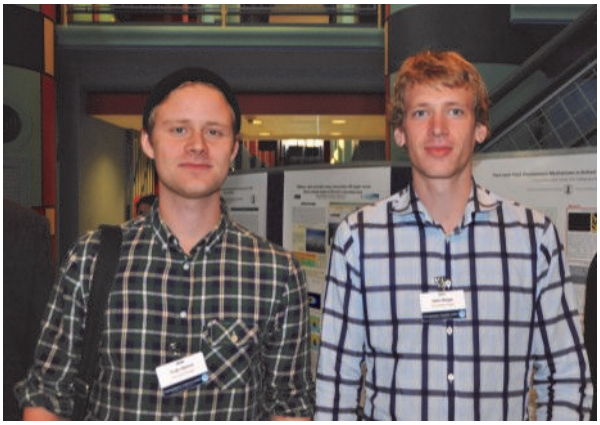
Co-Chairs: Stig Slørdahl, Dean of Medical Faculty, Norwegian University of Science and Technology
Kathryn E. Peek, Assistant Vice President for University Health Initiatives, University of Houston

The workshop brought together Norwegian and U.S. health professions education leaders to discuss modern challenges of health workforce development, and to explore possible transatlantic collaborations designed to jointly address these challenges. Topics included:

- How inter-professional health education is facilitating the development of collaborative, interdisciplinary teams of health care providers. The Universities of Tromso and North Dakota have developed effective models for training professionals to work on health care teams.
- A commitment to global health is essential for developed nations, for both humanitarian and pragmatic reasons. Leaders from Baylor College of Medicine and the University of Bergen shared their experiences and observations in developing and supporting global health initiatives.
- Post-graduate education is an essential element of inter-professional health practice. MD Anderson Cancer Center and the University of Oslo (among others) have developed innovative resources and tools to facilitate lifelong learning for health professionals.

Special Session on Think Tank Collaboration

Co-Chairs: Ambassador Edward P. Djerejian, Founding Director of the James A. Baker Institute,
Rice University, and Wegger Strømmen, Norway's Ambassador in the United States



*PhD students Truls Hamre and Hans Berge at the Student session at Rice University**

The Think Tank session had its focus on the role of Think Thanks in contemporary American and Norwegian public life. It was hosted by the James Baker Institute for Public Policy, at Rice University and included participants from the Peace Research Institute, PRIO, Oslo, the Humphrey School of Public Affairs, University of Minnesota, the FAFO - AIS, Institute of Applied International Studies and the Center for Islamic and Middle Easter Studies, University of Oslo. Discussions explored the space between Universities, the media and political actors. Most participants argued that there is indeed a need for institutions in this space, not least due to limited possibilities for in depth conversations in modern media and the more narrowly defined goals of research in many universities. Financing and political affiliation of Think Tanks were brought up and eagerly debated. A number of presentations on how Think Tanks actually work were made and proved useful for deliberations on the role and functioning of Think Tanks in general.

Student Session: Energy for the Future

***Co-Chairs**: George Hirasaki, Professor, Rice University and Arne Graue, Professor, University of Bergen*

The student session: Energy for the Future included presentations from PhD students from Norway and the US on emerging technologies and ongoing research efforts of high priority in their respective countries. Keynote addresses from the US Department of Energy (DoE) and comments from the Ministry of petroleum and energy in Norway underlined the importance of establishing scientific networks among the next generation of scientists and engineers in Norway and the US within the energy sector. A specific outcome related to the student involvement in TSW12 included a paper competition where one Norwegian student and one US student won a 3-month research visit in the counterpart country.

Wednesday 14th November:

Plenary Session

***Chairs**: Oliver Bogler, PhD, Senior V.P. Academic Affairs, V.P. Global Academic Programs, Professor of Neurosurgery, MD Anderson Cancer Center and Sigbjørn Smeland, President, Norwegian Cancer Consortium*

Dr. Oliver Bogler opened the session by welcoming participants to MD Anderson Cancer Center (MDACC) and highlighting MD Anderson's role in fighting cancer globally. Dr. Bogler's presentation is publicly available via this link. MD Anderson's Sister Institution Network; the largest global network of cancer centers working collaboratively on cancer research and education as key to developing global partnership. MDACC has created a sister institution fund which includes 42 projects and has $4.4 million funding over 4 years. It works by leveraging funds equally with partner institutions and has a total of $8.4 including partners. This includes 3 projects from Norway. To facilitate international collaboration, MD Anderson develope tools such as SciVal Experts to help researchers locate counterparts with shared interests as well as newsletters such as GAPconnect. In order to have impact on a global scale for Non Communicable diseases he stressed that it is important to work via international institutions such as the United Nations and the World Health Organization

Dr. Oliver Bogler opening the plenary session at MD Anderson Cancer Center

The keynote speech was given by Jonas Gahr Støre, Norwegian Minister of Health and Care Services, who outlined, the importance of childhood vaccination and maternal health, that are at the heart of Norway's global health goals, especially in the most vulnerable communities. He also highlighted the rise of non communicable diseases (NCDs) that arise from chronic life style conditions such as diabetes, obesity and lack of physical exercise – and from cancer, mental health, dementia and the needs of an ageing population. These are diseases that challenge the health systems of all countries, poor and rich and put new strains on their health systems. To tackle these public health challenges, governments need to adopt policies bases on knowledge, research and innovation to focus on prevention, early diagnosis and effective treatments. He emphasized his commitment to see that scientific research and assembled knowledge will underpin the objectives of Norway's policies and deliver health and care services that are available, equitable and effective. Global goals, he stressed, can only be tackled by effective international collaboration, such as the partnership between MD Anderson Cancer Center and its sister institutions Stavanger University Hospital and Oslo University Hospital and the Cancer Registry of Norway. He supported the proposed partnership between Norway and Texas, NorTeX, as an exciting new initiative and hoped that the meetings and encounters resulting from TSW12 will help strengthen this fine initiative. The full text of the Minister Store's speech can be read via this link.

*Keynote speaker, Minister of Health and Care Services Jonas Gahr Støre**

Olav Bergheim, Founder and Managing Director of Fjord Ventures LLC in California addressed how Innovative Technologies could revolutionize the Future of Healthcare. Data on global healthcare spending per capita shows that increased spending does not necessarily correlate with an increase in life expectancy and that innovation could improve life expectancy while reducing healthcare spending. The roles of physicians, technology and healthcare infrastructure and management are all critical in this increased

Olav Bergheim adressing how innovative technologies can revolutionize the future of healthcare

efficiency. He cited Hypertension as an example, a disease which as a direct cost of $131 million in the US and affects 68 million patients. In this case, a 10 second renal denervation treatment, using radio frequency beams, could reduce hypertension by 30 mm mercury, while every reduction of 20mm decrease in systolic blood pressure could cut the risk of stroke and cardiovascular disease in half. A JP Morgan Equity study in October 2011 called this *'the* next big thing in *cardiovascular devices'*. He also cited examples of how innovative medical technologies can be adopted to improve outcomes in breast cancer, diabetes and glaucoma.

Continuing in the theme of global health, Kenneth Mattox from Baylor College of Medicine outlined their global Ob/Gyn program in Malawi, which has the highest rate of maternal mortality worldwide, on capacity building to improve maternal-fetal health outcomes and increase life expectancy. Their focus is on training doctors, nurses and midwives to tackle post partum care. Their vision is to develop a scalable, self sustaining, Ob/Gyn healthcare and education model in Malawi that can then be expanded into a Global Ob/Gyn Initiative comprising multiple sites in multiple countries, working with multiple partners, for the benefit of local patients and healthcare providers. Their ultimate goal is to have a scaled process leading to independent and sustainable functioning system by Malawians over 5 years. These programs offer rich collaboration opportunities for Norway and other international academic institutions, governments, NGOs, and philanthropic foundations. They have launched a free educational initiative called 'Launchpad', currently beta tested in Malawi, which can be implemented and accessed worldwide. Dr. James Willerson, President of the Texas Heart Institute in Houston, followed with an update on the treatment of coronary heart disease and severe heart failure using adult stem cells, harvested from bone marrow. The seminar was concluded by a presentation on Cancer Treatment and Research in Norway, by Sigbjørn Smeland, President of the Norwegian Cancer Consortium, who outlined how this population based registry presents unique opportunities for researchers worldwide. It not only includes information on cancer incidence but also on treatment and life long follow up of the population. He also outlined how the government has implemented Norway's National Cancer plan by providing better access to radiotherapy, improved screening and diagnosis for breast cancer, research and palliative care, as well as standardized care guidelines with initiatives such as Oncolex, an encyclopedia for diagnosing and treating cancer. Personalized medicine is another focus, via the national initiative in genome-based cancer medicine carried out by the Norwegian National cancer genomics consortium, including the leading Norwegian universities and hospitals. The Norwegian approach has been widely praised for taking account of equally vital considerations such as having nationally agreed protocols and systems to handle and process new testing and data, as well as efforts to underpin health professional and public education, and provide health economic impact data. The Norwegian Cancer Consortium has strong collaborations, on an international level, via the EURAMOS-1 program (Randomized trial in Osteosarcoma), a pan-European/American collaboration and on the Institutional level, via the MD Anderson Sister Institution Network, a unique network of 26 leading international cancer institutions.

*The audience during the plenary session at MD Anderson Cancer Center**

The morning seminar was followed by a plenary lunch presentation by Robert Satcher, former astronaut, Assistant Professor in Orthopedics, MD Anderson Cancer Center on "*The interface of Space, Health and Telemedicine*".

Workshop: Palliative Medicine

***Co-chairs**: Stein Kaasa, Professor in Palliative Medicine, European Palliative Care Research Center, Norwegian University of Science and Technology /St. Olav Hospital, Trondheim and Eduardo Bruera, Professor, Department of Palliative Care and Rehabilitation Medicine, MD Anderson Cancer Center, Houston*

This workshop included presentations from palliative care researchers from the Norwegian University of Science and Technology, Trondheim, and MD Anderson Cancer Center, Houston. These two institutions have a long-standing history of collaborative research in palliative medicine.

The workshop consisted of two parts. Part one debated the implementation of palliative care in general cancer care. The background for this discussion is the emerging knowledge that cancer patients' disease trajectory is not divided into one phase where the only purpose for the treatment is to cure the disease and a later phase where only palliative care can be given. On the contrary, these phases overlap and therefore all health care personnel caring for cancer patients should be able to administer treatments directed at symptom control. The discussion included developments in Trondheim for implementing symptom assessments and therapy in outpatient cancer clinics, one example being the use of electronic devices to obtain patient self-reports and to guide pain therapy. The Houston center presented strategies and experiences in how to implement a palliative care unit in a large cancer center traditionally oriented towards the cure of cancer.

Part two of the workshop presented new developments within three specific symptoms: pain, dyspnea and cachexia. For all three symptoms there are challenges in understanding basic biological mechanisms, define symptoms assessments and classification, and to achieve symptom control. The discussions covered current research agendas, at the two centers, in relation to these three adverse symptoms.

Workshop: Cardiology

***Co-Chairs**: James Willerson, President, Texas Heart Institute, and Alf Inge Larsen, Professor, University of Bergen/Stavanger University Hospital*

This was a very productive workshop that has resulted in establishing new relationships and strengthening existing ones. Areas of discussion included:

- Coronary artery disease; detection and prevention by PET scanning
- Heart failure; basic mechanisms of contractile dysfunction and calcium metabolism
- Use of cardiac resynchronization therapy
- Exercise training in cardiology; effects on restenosis, inflammation and left ventricular performance.
- Alternative algorithms for treatment of patients with ST segment elevation myocardial infarction

The participants identified points 1 and 5 as issues for joint research and collaboration and suggested a follow up workshop focusing on these areas.

Workshop: Hypoxia and Cancer

***Co-Chairs**: Edward T.H. Yeh, Professor and Chair, Department of Cardiology, MD Anderson Cancer Center, and Erik O. Pettersen, Professor, Department of Physics, University of Oslo*

This workshop was well attended, especially by young MD Anderson researchers who took an active part in discussions. Participants gave an overview of central themes regarding the cancer-specificity and possibilities for new treatment principles connected to the hypoxic fraction of solid tumors. Three of the presentations were linked to the large-scale EU-financed project, METOXIA, coordinated by the University of Oslo, which represented the starting point for the planning of this workshop. The two main objectives of METOXIA are a) to seek new knowledge concerning tumor metastasis due to hypoxia and b) to translate this new knowledge into new treatment modalities. The interest from both the European (Norwegian) side and from the US side was created by the fact that METOXIA-participants and the two MD Anderson groups involved (from the Departments of Experimental Therapeutics and Cardiology) work on slightly different regulatory cellular pathways triggered by hypoxia than those included in METOXIA. This interconnection is of high interest for all the involved parties and should be further extended in the future. MD Anderson gave an overview of the signaling/sensing at moderate hypoxia (the HAF-HIF switch) and introduced the audience to the hypoxia response related to protein stabilization in connection to so-called SUMOylation, a mechanism influencing several cellular functions, including DNA-repair, which has not yet been studied in connection with the METOXIA project. The three presentations linked to METOXIA the Princess Margareth Hospital in Toronto, Canada, Oslo University Hospital and the University of Oslo. Their lectures covered a broad range of mechanisms and possible targets for new treatments: viz. novel signaling pathways, hypoxia biomarkers for personalized therapy and radio-modifying effects of cycling hypoxia. A specific mechanism for cellular sensing of severe hypoxia was also presented the University of Oslo; the deactivation by hypoxia of the enzyme Ribonucleotide Reductase which is necessary for DNA synthesis. The workshops and networking provided via TSW12 helped to strengthen the existing partnerships between the Norwegian and MD Anderson researchers, as well as initiate discussions on including MD Anderson colleagues in the follow-up projects of METOXIA.

Workshop: Research-based Education Keeping Pace with Innovation and Tech Transfer

***Co-Chairs**: Michael Mann, M.D., MIT Enterprise Forum of Texas and Emergency Physician, Memorial Hermann Northeast Hospital, and Hilde Skeie, Director of International Affairs, The Norwegian University of Science and Technology, NTNU*

After a warm and invigorating welcome by Ambassador Barry B. White, renowned educators, administrators and innovators showcased their efforts to invigorate applied research and technology development in their students, colleagues and institutions. The speakers generally described the strong entrepreneurship programs at the various universities represented and provided examples of successful outcomes of such programs. Industry, too, was represented at the program and a general description was provided of one particular company's program for fostering innovation of solutions for problems within that industry.

As part of the effort to conduct research of potential solutions to the world's vexing problems, the speakers highlighted the need for collaboration across all boundaries – government, business, and academia discipline – to achieve real innovation. A challenge exists in developing a collaborative process or model that identifies appropriate collaborative partners, taps the knowledge and aptitudes of the collaborative partners in the process, and meshes different disciplines and ways of thinking.

Special Workshop: Petroleum Technology
Part 1: Drilling and Deep-water Technology

Co-Chairs: *Svein Bredahl, Aker Solutions and Satish Nagarajaiah, Professor, Rice University*

*From the left: Satish Nagarajaiah (Rice University), Ove Flataker (The Petroleum and Energy Ministry), Siri Helle Friedeman (Research Council of Norway), Svein Bredahl (Aker Solutions), Kristian Brekke (Flowpro Group LLC), and Per Gerhard Grini (Statoil)**

A wide variety of technologies and themes were discussed. Ranging from Risk Assessment from Det Norske Veritas (DNV), to Deep-water Survey needed for safe installation of production facilities. DNV made it clear that many companies and projects set up a large amount of barriers and correlating procedures in order to prevent accidents, but that the main challenge is to follow these procedures. It is highly important to review the total risk throughout the whole project in order to prevent accidents and to secure safe operations and cost control. Schlumberger followed up by outlining the increased risks associated with deep water drilling and the importance of online well logging when drilling in deep waters in order to get enough information for safe operations. National Oilwell Varco (NOV) presented a new computer based operating system for drilling – NOVOS, to be launched in 2015. The system is under development partly in US and partly in Norway. It includes an operating system for the driller where all the services providers connected to drilling and well construction are connected with their own apps, allowing the driller to get all information needed in order to drill safely. NOV's goal is to control the automation process for the drilling operations. The Dutch company, Fugro has had huge success in the Gulf of Mexico the use of the autonomous underwater vehicle (AUV) Hugin 3500, developed in cooperation between Statoil, The Norwegian Defense Institute (FFI) and Kongsberg Maritime. Fugro uses Hugin in deep-water surveys in areas where oil companies plan to install platforms, moorings, or subsea equipment. Stavanger University explained the projects "extended reach drilling' and 'riser-less drilling'. The latter to be executed in Brazil at the Tupi field, where oil companies will use the Reelwell equipment to drill through salt in order to come into the reservoir 5000 meters below the seabed. The technology can be used for drilling from fixed platforms that can reach oil fields, which were otherwise abandoned or had separate installations. The method also enables the possibility to drill for shore to reservoirs situated in vulnerable areas. AGR presented the RMR technology they deliver to customers in the GoM. AGR also has a project where they qualify the next step in their development, the riser-less drilling and managed pressure drilling from the seabed.

Part 2: Subsea Processing and Production

Co-Chairs*: Per Gerhard Grini, Statoil, and Kristian Brekke, Tulsa University*

Sigmund Stokka, Research Director, International Research Institute of Stavanger (IRIS), credit Research Council Norway

The subsea seminar covered all the latest technologies under development or in use in order to finally realize the Subsea factory in deep waters in remote areas. Shell International in Houston underlined that use of subsea separation was an important factor when deciding new explorations which otherwise would not be developed. Subsea separation systems reduce the development cost and give the licensees the possibility to develop fields with different oil characteristics and transport petroleum to remote infrastructure. However there are challenges that need to be solved. Power supply, chemical

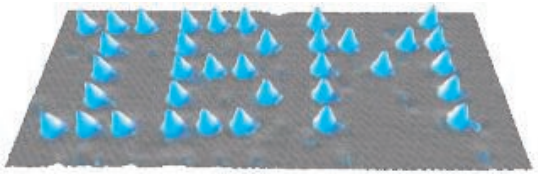
injection systems and the overall process engineering must be improved. The Marlim subsea separator delivered by FMC is unique. The basis for the development is the pipe separator developed by Norsk Hydro, later Statoil, and consists of a long horizontal pipe with gas outlets and one separator tank for treatment produced water. It separates gas, oil and water.

Siemens presented their plan for new electrical subsea distribution systems and testing of the subsea distribution grid. They develop systems that are pressure neutral in deep waters, and will use the ambient sea for cooling of the equipment. This will give smaller, lighter and more compact equipment. The most important Norwegian development for the petroleum exploration is the OLGA multiphase simulations system. This software, originally developed for the nuclear industry, enables long distance transportation of multiphase flows. It is possible to simulate any crude with this fluid and correlate this to the OLGA software and thereby predict the well stream behavior with higher accuracy. The new features IFE can offer will be important for the future of the petroleum industry when entering into remote areas, such as The Arctic

The Kavli Laureate Lecture

***Introductions by**: Nils Chr. Stenseth, President of the Norwegian Academy of Sciences and Letters and, Fred Kavli, Founder and CEO, The Kavli Foundation*

The Kavli lecture was presented by Dr. Donald M. Eigler, Fellow of the American Physical Society, Fellow of the American Association for the Advancement of Science and the 2010 Kavli Laureate in Nanoscience. Introductions were made by Nils Chr. Stenseth, President of the Norwegian Academy of Sciences and Letters and Fred Kavli, Founder and CEO, The Kavli Foundation. Dr. Eigler 's imaging of electron wave patterns in his demonstrations of quantum corrals earned him the front cover of Science, Physics Today and Nature, all within the space of a few months. He has received numerous awards for his work in Nanoscience. In May 2012 he was elected member of the National Academy of Sciences. He was the first person to arrange individual atoms into a desired pattern. He used a one of a kind multi-million dollar scanning tunneling microscope that he designed, and created entirely new fields of science. Eigler demonstrated for the first time the ability to build structures at the atomic level by spelling out "I-B-M" with individual xenon atoms, as shown below. A video of the lecture can be seen on the following link.



Don Eigler moved the first individual atom 20 years ago, and shortly afterwards, he wrote IBM's name with 35 Xenon atoms. (Credit: IBM)

Thursday, November 15, 2012

Workshop: Cancer Research Collaboration

Background:

Norway and MD Anderson Cancer Center have a long history of fruitful collaborations. This was helped by Norway's formation of the Norwegian Cancer Consortium (NCC), created as a direct result of the 2005 agreement in Research and Technology between Norway and North America. The NCC is comprised of The Norwegian Radium Hospital -Oslo University Hospital, The Stavanger University Hospital and The Cancer Register of Norway. The aim of the consortium is to formalize a working agreement with the University of Texas's MD Anderson Cancer Center (MDACC). The first MoU was signed in 2007 and renewed for five more years in 2012. There is a very active and dynamic collaboration between NCC and MDACC over a range of

projects, which deal with cancer therapeutics, predicting cancer metastases with circulating tumor cells, and the metastases of cancer through cancer stem cells. All of which represent innovative approaches to continuing the step-wise progression of better understanding cancer in order to defeat it.

The NCC has partnered with MDACC via the MD Anderson Cancer Center's Global Academic Programs (GAP), which includes 26 of the top international cancer institutions. GAP allows for multinational and multicenter research projects to be established with the aim of sharing data and working towards the same goal of MDACC (*making cancer history*). In addition the collaboration with MDACC allows transfer of faculty between NCC and MDACC to encourage best practice exchange of clinical care and research between the institutions.

In 2012 NCC hosted the annual Global Academic Programs conference, which was held outside of Houston, for the first time. Twenty-four countries participated and over 100 high level faculty from MD Anderson, making the 2012 GAP conference the largest yet with approximately 400 delegates.

This strong history of collaboration formed part of the background for including medical research as a central dimension if TSW12, and also trigged the generous willingness of MDACC to serve as a key host for TSW12. Furthermore, the past collaboration served as one motivating factor for the Norwegian Minister of Health and Care Services' decision to participate at TSW12, and in that same context bring with him a significant group of Norwegian medical and health professionals to Houston. Some of the past and on-going projects between Norway and MDACC were presented and taken further during TSW12.

Part 1: Lung Cancer

***Co-Chairs**: Åslaug Helland, Associate Professor, Department of Oncology, University of Oslo, and Vassiliki Papadimitrakopoulou, Professor, Department of Thoracic/Head and Neck Medical Oncology, MD Anderson Cancer Center.*

The lung cancer workshop consisted of two talks from the University of Oslo and two from MD Anderson's proton-therapy facility. Discussions covered the latest developments in the molecular characterization of the disease to personalized therapeutics and proton therapy for thoracic malignancies. There are some strong on -going projects that could result in interesting collaborations. Oslo colleagues invited their MD Anderson colleagues to visit and participate in upcoming meetings in person or via web links.

Part 2: Melanoma

***Co-Chairs**: Lynda Chin, Professor and Chair, Genomic Medicine, Scientific Director, Institute of Applied Cancer Science, MD Anderson Cancer Center, and Øystein Fodstad, Professor, Oslo University Hospital.*

From being an almost intractable disease when metastasized, melanoma has emerged as one of the most interesting solid tumors in oncology with entirely new treatment options.
Targeted therapy, depending on genetic changes in the tumor, and immunotherapy are the new melanoma therapies. This workshop included presentations from clinical melanoma researchers from Oslo University Hospital and MD Anderson Cancer Center, Houston. Both institutions are heavily involved in developing new melanoma therapies. The presentations covered results from clinical trials with dendritic cell vaccine using cells transfected with tumor mRNA, anti-angiogenesis therapy and results from large-scale analysis of melanoma exome data identifying new potentially targetable mutations.

Norway with the second highest melanoma incidence in Europe and Texas with the third highest incidence in the US and a steady increase of new cases, provide a large cohort of patients requiring better treatments.

Part 3: Cancer Vaccines

Co-Chairs: *Steinar Aamdal, Head of Section for Clinical Cancer Research and Resource Development, Oslo University Hospital and Larry Kwak, Professor, MD Anderson Cancer Center*

Like many of the other TSW12 sessions, this seminar was populated by world-renowned experts in their field and therefore represented the latest advances in immunotherapy. Oslo University Hospital, Radiumhospitalet has an existing a formal collaboration with Prof. Malcolm Brenner, Director of the Center for Cell Gene Therapy at Baylor College of Medicine in Houston, on adoptive T-cell therapy. Future collaborations with Professor Larry Kwak at MD Anderson Cancer Center were also discussed.

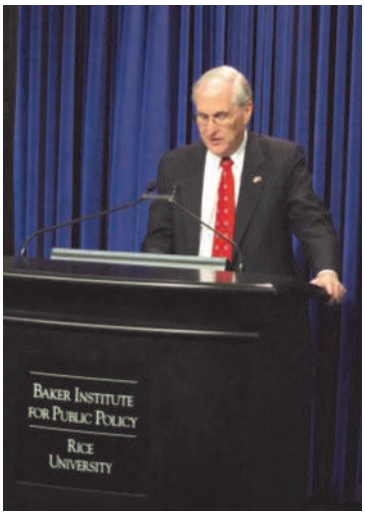
Special Session: Fulbright Arctic Chairs and beyond

Chair*: Jarle Aarbakke, Rector, University of Tromsø, Norway*

Jarle Aarbakke, Rector at University of Tromsø, speaking at the Artic Fulbright Session, credit Timothy Moore

The US-Norway Fulbright Foundation, in collaboration with TSW12, organizers, professor Anders Elverhøi, and Public Affairs Counselor Tim Moore of the US embassy, organized a special session entitled "Fulbright Arctic Chairs and Beyond." This well-attended session, held a day after the conclusion of the conference proper, examined the Arctic Chair and other joint Norwegian-North American projects with an emphasis on sharing best practices, strengthening scientific collaboration, and improving logistical coordination and resource sharing.

Presenters and audience members were gathered with the understanding that the challenges facing the Arctic and High North region are multidimensional and global in scope, and require a deliberate and carefully concerted international response. Furthermore, only through international scientific collaboration, resource sharing and logistical coordination will it be possible to safeguard biodiversity, monitor and understand the implications of climate change, and resolve international disputes in the region. Panelists from Norway, the U.S. and Canada, including U.S. Ambassador Barry White, Secretary General Pål Sørgaard of the Norwegian Ministry of Education, and Fulbright Arctic Chairs Lise Øvreås and Jeffrey Welker, provided insightful presentations about a range of scientific projects focusing on the Arctic region.



U.S. Ambassador to Norway Barry White, copyright Timothy Moore

In addition to the significant fruits of collegial networking, this TSW12 session yielded a specific proposal to approach Statoil about possibilities for further funding of a Fulbright Arctic Chair. The idea was proposed by President of the Norwegian Academy of Sciences and Letters, Nils Christian Stenseth, the U.S. Embassy, and the U.S. Norway Fulbright Commission will work together in 2013 on moving this forward.

Workshop: Diasporas in Conflict

***Chair**: Kristian Berg Harpviken, Director, Peace Research Institute Oslo*

PRIO, in collaboration with the George Washington Diaspora Research Program, hosted a panel on diasporas and conflict at the TSW Houston. Research has shown that diasporas, migrant communities that maintain economic, socio-cultural and political ties with their country of origin and its Citizens abroad, influence conflicts in their countries of origin. Their transnational activities may at times prolong warfare, at times also facilitating peace. Whereas originally, most research on diasporas focused on their support for insurgencies and their contribution to political instability, in later years a more nuanced picture has emerged. Return to (post) conflict settings is one important channel through which diasporas can play an important political role: After a stay in Europe or the US of 15 to 20 years, Somalis are now returning to Mogadishu, some taking positions as Members of Parliament. Ellen Sirleaf Johnson, the president of Liberia, is not only the first female president, but also a president who was educated in the US and has spent a large part of her adult life outside Liberia.

Speakers Cindy Horst (PRIO), Stephen Lubkemann (GWU) and Ibrahim Noor (University of Minnesota), as well as discussant Jeronimo Cortina (University of Houston), engaged with questions like: How does their stay abroad impact diaspora understandings of their role in the country of origin? How are diaspora perceived in their country of origin, what underlies the legitimacy of their contributions? What impacts do diaspora transnational ties and contacts in Europe and the US have on economic and political transformation processes in country of origin? The workshop enabled ongoing collaborations between PRIO and GWU - in particular plans for joint publications - to advance. Furthermore, PRIO and the University of Minnesota are committed to submitting a joint proposal for research funding on a project focusing on the impact of return of Somali-Norwegians and Somali-Americans.

Workshop on Synergies between Space and Offshore Exploration

***Co-Chairs**: David Alexander, Rice University and Bjørn Ottar Elseth, Senior Advisor, Norwegian Space Center.*

The workshop was well represented with about 60 representatives from the US and Norway, mostly from NASA's Johnson Space Center (JSC), the Norwegian Space Center, academia and aerospace and energy companies. The three presentations from NASA-JSC covered their wide variety of technology developments and their perspective on collaboration, both institutional and with industry, as well as the need for international collaboration. The Norwegian Space Center emphasized the positive cooperation already existing in science and ground station services at Svalbard and signaled a positive attitude towards more cooperation on technology-based projects. Overall, the presentations from the speakers presented a variety of common themes between the Space and the Energy sector that could provide the foundation for collaborative discussions between the US and Norway. Key topics are material science, nanotechnology, robotics, resource mining, drilling, automation, energy storage and safety and crisis management and systems engineering (the challenges with integration and big projects).

NASA JSC and the Norwegian Space Center (NSC) had two meetings in conjunction with and as a result of the seminar, and will evaluate possible new US-Norwegian space technology projects. Rice University's Space Institute provides a means by which to bring together space, medicine and energy partnerships to identify the technological synergies across these disparate fields and to address the crosscutting technology issues that formed the theme of the workshop. A partnership between Rice and the University of Stavanger with a focus on identifying common themes that can build bridges between the space and energy (and the medical) communities with technology innovation as the linchpin would be very fruitful. Safety management is one of the areas under consideration. Robotics and simulation are potential areas of partnerships between the Norwegian energy industry, NASA and US industry. The chairs concluded that successful innovation requires

support from and cooperation between government, academia and industry.

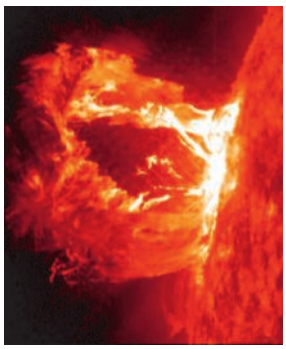
Workshop: Emerging Technologies and Commercialization

***Co-Chairs**: Nina Langeland, Dean of Faculty of Medicine and Dentistry, University of Bergen*
George McLendon, Howard H Hughes Provost and Professor of Chemistry, Rice University

The session ranged from talks on inexpensive and robust technologies intended for the developing world, but still smart for industrialized nations, to pure advice and options for commercialization of ideas. It included excellent examples of simple inventions with large potentials beyond the initial scope, such as the use of smart phones, as well as engineering development fostered through the needs of war settings. Other discussions focused on examples where the necessity of inexpensiveness and robustness in medical diagnostics in the setting of developing nations brought about inventions and solutions, which will also serve in affluent settings. Lab-on-a-chip innovations in medical diagnostics intended for developing nations can also be commercialized for global usage as well as programmable bio-nano-chip sensors, which brought the former topic even further. This was followed by discussions on a novel technology of targeted cancer drug deliver, which is in the process of commercialization. The final talk covered the commercialization of academic ideas in general, and the various systems of funding which are present and being built upon in and around Houston and the medical and academic institutions in the region. All talks sparked questions and comments from the audience, and seem to fit well into the ideas sketched in the NorTex Pilot study, commissioned by the Norwegian Consulate in Houston, proposing a mechanism for seed funding for collaborative research and collaboration, involving industry and academic institutions within the fields of Energy and Medicine.

Special Lecture on Solar & Space

Title: Our Explosive Sun – The Source of the Northern Lights
Presenter: Pål Brekke, Senior Advisor, Norwegian Space Center
***Chair**: David Alexander, Director, Rice Space Institute, Rice University*



The beautiful aurora borealis, "the northern lights," dancing across the sky is a stunning phenomenon embedded in the mythology of many cultures and has been characterized as everything from dancing spirits to God's anger. But no one suspected the phenomenon's connection with the Sun until a little more than a hundred years ago, when an eccentric Norwegian scientist, Kristian Birkeland, realized that the Sun bombards the Earth with particles. In a multimedia presentation with breathtaking imagery of the Sun from NASA's Solar Dynamic Observatory and the most amazing time lapses of the mystical Northern lights, Dr. Pål Brekke explored the myths and the modern science behind the northern lights and our Sun, a stormy and variable star that can affect our technology-based society in many ways.

Friday, November 16, 2012

The Abel Prize Seminar

***Chair**: William Beckner, Professor of Mathematics, University of Texas Austin*

This seminar focused on three themes: the broad legacy of Abel's mathematical achievements, the work of John T. Tate, Jr. [Abel Laureate 2010], and the impact of fundamental mathematics in crossing scientific boundaries for technological application. The seminar featured talks from distinguished US and Norwegian mathematicians, including a video-taped conversation with Ingrid Daubechies (Duke University and President of the International Mathematical Union) on collaboration across interdisciplinary boundaries, and closing

outcomes drawn from the seminar. An overwhelming theme of the seminar talks was the interaction and relevance of abstract mathematics with the technology on which our society increasingly depends, plus the way that chance encounter facilitates cross-disciplinary scientific innovation.

Four recommendations could be drawn from this inaugural Abel Prize Seminar:

- The Abel Prize Seminar should be made a permanent part of the annual Transatlantic Science Week. Scientific interaction should be encouraged between academic programs at universities in Texas (especially the University of Texas at Austin, Texas A&M University and Rice University) and
- Norwegian industry, particularly in terms of application related to a) software design and scientific computation, b) communication technology, c) computational seismology and geophysical fluid modeling, and possibly d) mathematical risk and finance.
- Redesign of graduate training in university programs to encourage increased conversation and interaction across scientific and engineering disciplines.
- Development and innovation for a pre-college mathematics curriculum that would be both exciting and relevant to showing students the importance of Mathematics for career choice.

Though small in initial scope, this Abel Prize Seminar suggests a program to encourage future activity that will enhance public awareness for the legacy of Abel's mathematical achievement and for the underlying impact of Mathematics on technological advances that will help our society, and that will encourage scientific and engineering collaboration between Norwegian and American universities.

The NorTex Petroleum Cluster

NorTex is a collaboration between four Norwegian universities, four universities in Texas, and oil- and service industry in Texas and in Norway. The objectives of NorTex Petroleum Cluster are to initiate or strengthen and coordinate collaboration on petroleum related education and research cooperation between Norway and Texas. The Cluster will assist in facilitating industry funding for adjunct and chair positions at the collaborating universities; especially emphasizing the NorTex collaboration. The Cluster will emphasize industry challenges to be exposed to the academia.

The concept of NorTex relates back to the Transatlantic Science Week 2012, which was held in Houston, when approximately 200 people related to universities in Norway came over to Texas to attend the conference. Among those people were Rectors from the five major universities: University of Oslo, University of Bergen, University of Stavanger, University of Tromsø, and NTNU in Trondheim, who came to participate in the conference, but also to seek out common interests where cooperation would be beneficial. From a Norwegian perspective it has been a clear statement that Texas is important, as seen by three parliamentary delegations visiting the last three years, as well as two Ministers of Health and Care Services, two Ministers of Education and Research, the Minister of Defense, and the Minister of Petroleum and Energy. When Ola Borten Moe, the current Minister of Petroleum and Energy, came to Houston he visited University of Austin and familiarized himself with Statoil's Academia-program. Through this program, Statoil funds UT Austin with one million dollars a year for five years, in an attempt to transfer research from paper into action. Consequently, the increased presence of Norwegian companies and people has strengthened ties between Norway and Texas, which in turn has increased the relevance of a formulated collaboration between these two entities. As a result, the notion of NorTex was born.

NorTex is the suggested establishment of a Norway-Texas Energy and Biomedical Science and Technology Partnership, which is meant to result in exchange of students, teachers, and industry professionals and to

improve research collaboration between universities and industry. The idea of a Petroleum Cluster was conceived at the Transatlantic Science Week, with the idea of coordinating the various petroleum related research activities between Norway and Texas. At the first meeting, an Interim Board was created and Arne Graue, professor at University of Bergen, was elected as Chairman of the Interim Board for a period of three years.

The main area of focus for the Cluster is to initiate and expand collaboration on petroleum education and research between universities and industry in Norway and Texas, and further to integrate relevant industry into the different university collaborations. Members in the Executive Board of the NorTex Petroleum Cluster are from University of Bergen, University of Stavanger, and NTNU in Trondheim, and in Texas: Rice University, University of Houston, University of Texas at Austin, and Texas A&M. Also, the Board Members from the industry this far include Schlumberger and Statoil. The number of companies in the Cluster will increase as the level of activity increases; the startup phase will be focused on EOR.

As a starting point the board suggested two adjunct professor positions in Norway and two in Texas, where the position will demand a certain time spent at the host institution. The commitment for the position will be one year, with the opportunity to stay on for a total of three years. The Board argued that in an attempt to integrate academia and industry it is desirable to get people from the industry to lecture at the member universities.

A natural starting point regarding a specific field of study would be carbon capture storage and next generation CO2 injection for increased recovery of oil. This field has strong relevance for both parties and a great upside potential, thereby emphasizing the advantages provided by the NorTex Petroleum Cluster.

NorTex is only in the startup phase, but due to its relevance it will be interesting to observe the Cluster in the near future – the potential is great and the people contributing are all experts within their fields. Thus, results should be observable in the foreseeable future, which will benefit both Norway and Texas, and hopefully the world of petroleum and energy as a whole.

organizing tsw12 hosts

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Partnering Venue Institutions:

Rice University

MD Anderson Cancer Center

Collaborating Hosts:

Innovation Norway

INTSOK, www.intsok.no

Norwegian American Chamber of Commerce, NACC

The Research Council of Norway

The Research Council of Norway is a government funded institution, designed to help facilitate and vanguard advanced research in Norway. Last year they received over $ 120 million to promote research within its five divisions: Science, Energy, Resources and the Environment, Society and Health, Innovation and Administration .

Statoil

Statoil is an international energy company with operations in 37 countries. Building on 40 years of experience from oil and gas production on the Norwegian continental shelf, they are committed to accommodating the world's energy needs in a responsible manner, applying technology and creating innovative business solutions. They are headquartered in Norway with approx. 21,000 employees worldwide, and their North American upstream activities are managed out of Houston, Texas and Calgary, Alberta.

Det Norske Veritas (DNV)

DNV (Det Norske Veritas) is an independent foundation with the purpose of safeguarding life, property, and the environment. Their history goes back to 1864, when the foundation was established in Norway to inspect and evaluate the technical condition of Norwegian merchant vessels. DNV is one of the three major companies in the classification society business, with 300 offices in 100 countries, and over 10,000 employees. Important industries where the company operates include ship transport, energy (including wind and solar), aviation, automotive, finance, food, health care and information technology.

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