

CAS Scholarships for Visiting Professors

The aim of the scholarship programme is to invite world-renowned scientists representing international research institutions who, by delivering lectures on innovative solutions and modern technologies as well as by running seminars with students, PhD students and academics, will strengthen the WUT academic community's intellectual potential.

IN THE SPRING SEMESTER OF 2013/2014, THE CENTER FOR ADVANCED STUDIES HOSTED THE FOLLOWING SCIENTISTS:

- Gaetano Assanto, Department of Electronic Engineering, University of Rome "Roma Tre" (Italy)
- Zeev Baran, Honorary Consul General of Poland in Jerusalem (Israel)
- Michael Berry, HH Wills Physics Laboratory, University of Bristol (UK)
- Bill Bruce, Edge Hill University (UK)
- James Damon, Department of Mathematics, University of North Carolina (USA) - **the second part of the visit**
- David Djurado, National Center for Scientific Research (France)
- Maria del Carmen Romero Fuster, Department of Geometry and Topology, University of Valencia (Spain) - **the first part of the visit**
- Michael Giersig, Department of Physics, Freie University Berlin (Germany)
- Bartosz Grzybowski, Non-Equilibrium Energy Research Center, Northwestern University (USA)
- Goo Ishikawa, Department of Mathematics, Hokkaido University (Japan)
- Shuichi Izumiya, Department of Mathematics, Faculty of Science, Hokkaido University (Japan) - **the second part of the visit**
- Joaquim Joao Judice, Instituto de Telecomunicações, Polo de Coimbra (Portugal)
- Wojciech Knap, University of Montpellier 2 & National Center for Scientific Research (France)
- Seiji Kuroda, National Institute for Materials Science (Japan)
- Franck Leprévost, University of Luxembourg (Luxembourg)
- Mutsu Oka, Tokyo University of Science & Tokyo Institute of Technology (Japan)
- Osamu Saeki, Institute of Mathematics for Industry, Kyushu University (Japan)
- Ilan Riess, Physics Department, Technion - Israel Institute of Technology (Israel)
- Joachim Rubinstein, Department of Mathematics and Statistics, University of Melbourne (Australia)
- Gerd Rudolph, Institute for Theoretical Physics, University of Leipzig (Germany)
- Meir Shillor, Department of Mathematics and Statistics, Oakland University (USA)
- Tomoyoshi Shimobaba, Chiba University (Japan)
- Farid Tari, Instituto de Ciências Matemáticas e de Computação, Universidade de São Paulo (Brazil)
- Sabu Thomas, Centre for Nanoscience and Nanotechnology, Mahatma Gandhi University (India)
- Keizo Yamaguchi, Hokkaido University (Japan)
- Ehrenfried Zschech, Technical University Dresden & Fraunhofer IKTS Dresden (Germany) - **the second part of the visit**

IN THE AUTUMN SEMESTER OF 2014/2015 THE WARSAW UNIVERSITY OF TECHNOLOGY WILL BE VISITED BY:

- Marco Cantoni, Centre For Electron Microscopy CIME, École Polytechnique Fédérale De Lausanne (Switzerland)
- Jose Alberto Cuminato, Instituto de Ciências Matemáticas e de Computação, Universidade de São Paulo (Brazil)
- Alexey Davydov, Functional Analysis and its Applications Department, Vladimir State University (Russia)
- Takuo Fukuda, Tokyo Institute of Technology & Department of Mathematics, Nihon University (Japan) - **the second part of the visit**
- Victor Goryunov, Department of Mathematical Science, University of Liverpool (UK)
- Cecilia Haskins, Department of Production and Quality Engineering, Norwegian University of Science and Technology (Norway)
- Adam Kowalczyk, Victoria Research Laboratories, National ICT Australia (NICTA), The University of Melbourne (Australia) - **the second part of the visit**
- Terence Langdon, Department of Aerospace and Mechanical Engineering, University of Southern California (USA) and Engineering and the Environment, University of Southampton (UK)
- Takashi Nishimura, Institute of Environment and Information Sciences, Yokohama National University (Japan)
- Maria del Carmen Romero Fuster, Department of Geometry and Topology, University of Valencia, Spain - **the second part of the visit**
- Armen Sergeev, Steklov Mathematical Institute (Russia)
- Tomasz Wielicki, Craig School of Business, California State University (USA)

To find more information on scholarships for visiting professors please visit <http://www.csz.pw.edu.pl/index.php/cszeng/Scholarships/Visiting-Professors>

The CAS scholarships for visiting professors are co-financed by the European Union within the European Social Fund

Calendar of Events

- MAY 2014**
 - > Top Engineering Series: *Geared Turbofan Engine - Revolution in Aircraft Propulsion Systems* by Marek Darecki, President of the Board of WSK "PZL-Rzeszów", Chairman of Pratt Whitney Poland
 - > CAS Spring Scientific Workshop, Sterdyń
 - > Publishing of the 10th issue of the *Profundere Scientiam* CAS bulletin
 - > Publishing of the 6th issue of the CAS Newsletter
 - > Publishing of a book within the *CAS Lecture Notes* titled *Geometric Tools* by Professor Irmina Herbut (WUT) and Professor Maria Moszyńska (UW)
 - > Meeting of the CAS Advisory Council
- JUNE 2014**
 - > WUT Colloquium Lecture: *Making Light of Mathematics* by Professor Sir Michael Berry, Bristol University, UK
 - > WUT Colloquium Lecture: *The Latest Projects* by architect Mario Botta, Academy of Architecture in Mendrisio, Switzerland
 - > 5th workshop co-organised by the Polish Children's Fund and the Center for Advanced Studies
 - > CAS Mini Mathematical Workshop - *Singularity and Related Topics*
 - > Constituting the CAS Judging Panel for task 6 (targeted international research scholarships) of the project titled *Supporting Educational Initiatives of the Warsaw University of Technology in Teaching and Skill Improvement Training in the Area of Teleinformatics*
- JULY 2014**
 - > CAS Mini Mathematical Workshop - *Caustics and Singularities*
- AUGUST 2014**
 - > Computer Holography Workshop
 - > Signing of an academic exchange agreement between the Warsaw University of Technology and Hokkaido University, Japan
- OCTOBER 2014**
 - > Launching of the CAS Advanced Studies Offer for the 2014/2015 autumn semester, 7 basic and 6 special lectures
 - > *Effective Methods in Information Management* - training session for WUT PhD students
 - > Publishing of the 11th issue of the *Profundere Scientiam* CAS bulletin
 - > Targeted international research scholarships for WUT PhD students and academics - visits at the University of Luxembourg, Polytech Nantes and the Technical University of Denmark - announcement of competitions
 - > Special seminar - *Large-scale Problems, Methods and Calculations. The Challenges of Engineering and Business Modelling* - a series of lectures co-organised by the Center for Advanced Studies and the Centre for Information Technology (WUT)
 - > CAS Autumn Scientific Workshop, Radziejowice Palace

Participants of the workshop in Radziejowice

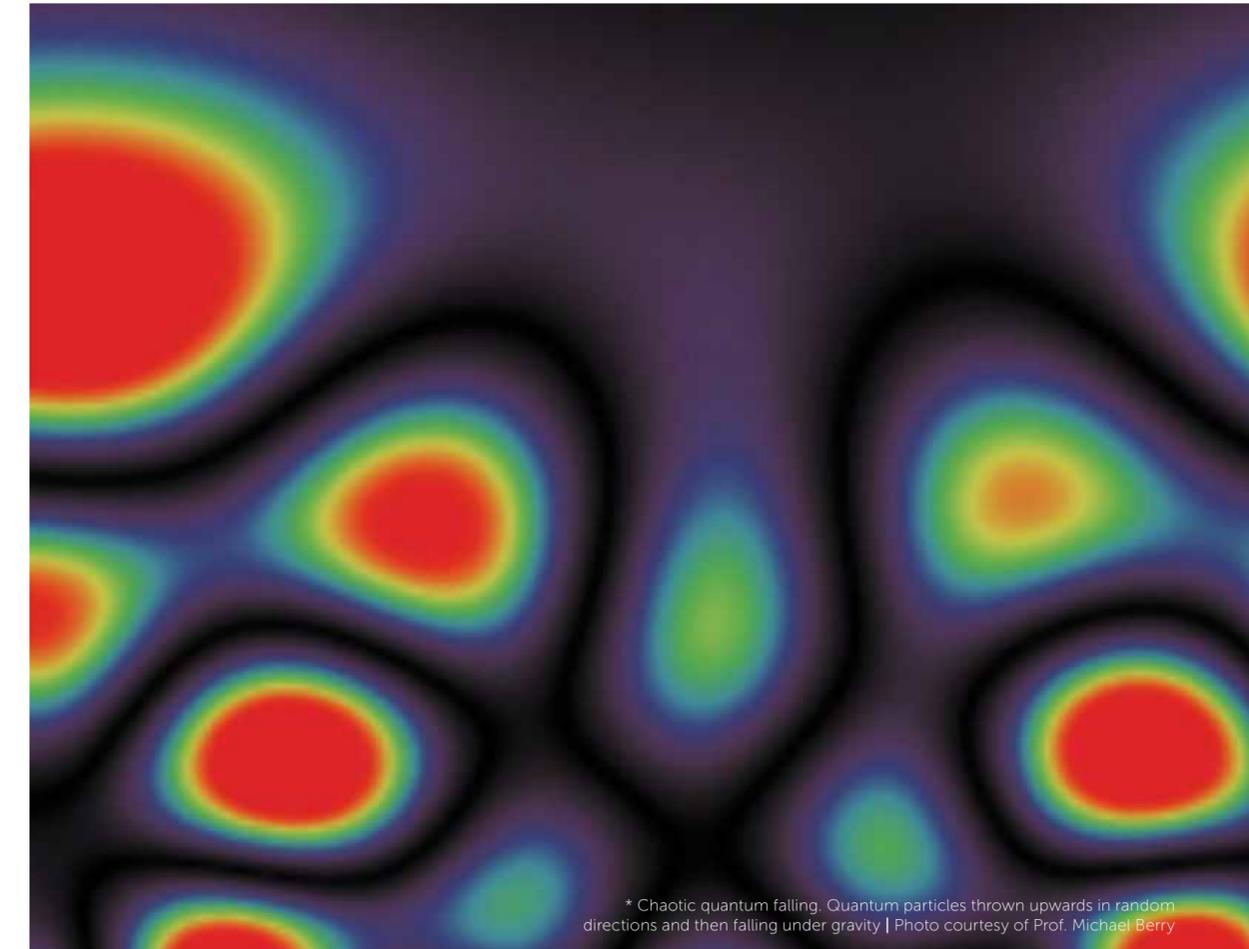


7 NEWSLETTER

No. NOVEMBER 2014



Center for Advanced Studies
OF WARSAW UNIVERSITY OF TECHNOLOGY



* Chaotic quantum falling. Quantum particles thrown upwards in random directions and then falling under gravity | Photo courtesy of Prof. Michael Berry

CAS Newsletter

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Newsletter no. 7 covers the tenth and the eleventh issue of the *Profundere Scientiam* CAS bulletin (published in May and October 2014).
See all of the *Profundere Scientiam* issues at www.csz.pw.edu.pl/index.php/biuletyn

Fighting for a brighter future



based on an interview given by the President of Hokkaido University, Professor Keizo Yamaguchi, published in the *Profundere Scientiam CAS* bulletin, issue no. 10

Featured by its motto: “Be ambitious”, repeated after the university’s initiator and first president William S. Clark, Hokkaido University is one of the most prestigious universities in Japan. For years the university has strived to create a competitive didactic offer, a range of scholarship programmes, to select inspiring and supporting teaching staff and to develop international cooperation with other units. The mission of Hokkaido University is not only to educate but also to make students pursue their own scientific paths and to make them look at the world with their own eyes. Yet, molding students’ independence is no small deed, as the Japanese model of upbringing with its main characteristics, i.e. obedience towards parents accompanied with excessive care for children and the lack of parental determination to fold down the umbrella, affects young people’s personalities to a great extent. As a consequence, Japanese students are inclined to be passive and tutor-dependent and, although the master-pupil relation is considered unique and beneficial with many respects, for it provides valuable guidance, it may also limit pupils’ courage to elbow through obstacles occurring in the research process. Additionally, masters may focus too much on their areas of research and may discourage pupils’ initiatives towards multi-directional experimenting.

Despite its unquestionable prestige, which has been achieved by setting high educational standards, Hokkaido University’s further existence is at stake. The reason for this fear is Japan’s population decline, which will eventually enforce the closing of many ex-

isting Japanese state universities. In the face of such a threat, Professor Yamaguchi has to find a remedy for maintaining the university’s stable condition. All actions to be taken must increase the competitiveness of Hokkaido University in the educational market. This may be achieved by designing the university’s unique profile, promoting the most excellent academics, developing up-to-date curricula and working out effective forms of close inter-faculty cooperation. The above guidelines, according to the President of Hokkaido University, will constitute “effective solutions to survive”.



Professor Keizo Yamaguchi is an outstanding mathematician, specialist in differential geometry, graduate of Kyoto University and Nagoya University, Japan; he has been affiliated with Hokkaido University, Japan since 1978 until the present. That is where his academic career developed. Professor Yamaguchi has held many prestigious positions: as Dean of the Graduate School of Science, Senator, Executive and Vice-President. In April 2013 he was elected the President of Hokkaido University.

Vantage Point: The Shoulders of Giants

based on an interview given by Professor Sir Michael Berry, published in the *Profundere Scientiam CAS* bulletin, issue no. 11

Characterised by his unending curiosity of the world, Professor Michael Berry has devoted his professional life to looking for connections between many physical phenomena across different levels and dimensions. Far from calling himself a genius – although for many he appears to be one – and known for his pioneering discovery of the geometric phase, Professor Berry has admitted that rewards, especially financial ones, will never be a driving force in his career. It is the very ability to make science that brings him pleasure and joy, and that is the best reward ever. Professor Berry’s recipe for success is a combination of several elements – timing, which means conducting research at a convenient moment when the topic has not yet gained much attention from other scientists and a breakthrough is still in our hands, persistence, hard work and observing the achievements of others – although not too many of those. And, finally, repeating the words of the great scholar Louis Pasteur, the mind must be prepared. As Professor Berry elaborates, when we are close to making a discovery, one little impulse may spur an avalanche of ideas which may eventually lead us to the answer we have been looking for. Physicists are not detached from reality and are not highly limited in perceiving the world. They do not hide behind data, figures and equations. It is true that they operate at a different level of understanding in comparison with non-scientists, however, to know more is to see more. In a rainbow, which is a visually beautiful phenomenon in itself, there is a range of scientific processes which take place. Knowing these phenomena intensifies one’s aesthetic impressions. Thus, beauty and science are one. The latter explains a given phenomenon but does not deprive it of the former. On the contrary, its beauty will be completed and we can be left aware and delighted at the same time.

Professor Berry shares with the reader his vision of contemporary science. He sheds some light on the reasons why it might be threatened. One menace is the lack of autonomy to do research in countries where rampant religious fanaticism has taken away freedom and replaced it with obedience and mantra-repeated prayers. Also, strict morality-related issues are likely to hinder any advancement in science.

Another impediment comes from scientists’ unshakable self-praise after a given research project has been completed. According to Professor Berry, one should not rest on the laurels as there is always more to discover. In this sense a research process never ends. Many a time, excessive enthusiasm over a proved theory has overshadowed the fact that there is still much to do in a given scientific topic. We cannot remain deaf and mute to the countless layers of cognitions, some of which we have already reached, but many of which are still coated in the mist of human ignorance. On the other hand, Professor Berry remarks that the human species is cognitively limited and that this limitation is a natural barrier on our way to full comprehension of the world and beyond. All-encompassing cognition itself is like a dance which is to lead us to the core of the fundamental question on the origin of everything that exists. However, we should not expect to receive the ultimate answer. The dance will continue as long as humans are around.

Professor Sir Michael Berry is a world-renowned physicist famous for the discovery of the geometric phase, called the Berry phase, in quantum mechanics; he has been affiliated with the University of Bristol for nearly 50 years. Professor Berry’s scientific interests concern mathematical physics, quantum mechanics, optics and photonics. He is the author of over 470 articles which were published in prestigious scientific journals; a recipient of numerous awards, including the Wolf Prize, the Royal Medal and the 2000 Ig Nobel Prize. He holds 10 honorary doctorates, one honorary professorship and was knighted by Queen Elizabeth. Professor Berry is a member of the Royal Society of London and was the editor of the *Proceedings of the Royal Society*, one of the oldest and most reputable research journals worldwide. As a visiting scholar, Professor Michael Berry held positions in Nigeria, Italy, Germany, the Netherlands, Switzerland, Australia, New Zealand, USA, Israel and Belgium.

Running for the Homestretch

CAS in the project *Warsaw University of Technology Development Programme*

Both science and the entire educational system are the building blocks of the future. Thus, people who are involved in this process are burdened with the great responsibility of working out, implementing and maintaining high standards of innovation and the purpose of conducted research and, as a consequence, of facing the demands boosted by contemporary society. Undoubtedly, PhD students and post-docs constitute a part of this group as they are people endowed with higher-than-average intellectual potential and, with the support of more experienced academics, are able to formulate bold scientific ideas. The Center for Advanced Studies, with its diversified and interdisciplinary activity and which was implemented to promote areas of supreme science, has managed to attract many brilliant representatives. The Center, a unit which is unique and of its kind in Poland, was established to gather prominent scientists who are both highly experienced and those who have just begun their professional path. It is a place where one has the opportunity to attend lectures delivered by specialists that are characterised by an open-minded approach to the mission of being an academic teacher and who wish to activate the potential that is latent in young minds. Thus, the Center fulfills its primary goal, i.e. it creates intellectual debates which lead to innovative research ideas and to an understating of the complexity of multidimensional scientific themes.

By carrying out scholarship programmes addressed to WUT PhD students and academics, within tasks 3 and 4 of the project *Warsaw University of Technology Development Programme*, the Center has supported, in a broad sense of the word, beneficiaries in their aspirations to climb further in their scientific careers. Since the beginning of launching the project the Center has announced 5 editions of competitions for home research scholarships directed towards WUT PhD students and postdoctoral scientists as well as 6 editions of competitions for international research scholarships addressed to PhD students and academics. As a result of organising all of the above competitions, the CAS Judging Panel has granted 490 scholarships altogether. Thanks to this support, beneficiaries continued or completed research, both at their home university and at research centres abroad. Many of these visits turned out to be starting points for regular cooperation between WUT and leading international scientific institutions.

As a part of the scholarship programme for visiting professors, CAS hosted 69 distinguished professors from all over the world. These visiting scholars ran classes, seminars and gave lectures (so far estimated at 800 hours) – and all of these didactic activities have provided



CERN: ALICE Experiment in which a few of CAS scholarships holders have taken part | source: cds.cern.ch

a platform for scientific discussions with members of the WUT academic community. By the end of the project, 15 more scholars will have visited the Warsaw University of Technology. Another form fostering the development of young scientists is the organisation of training sessions. Since 2009 the Center has held 12 training sessions devoted to HR, information and project management, interpersonal communication, assertiveness and dealing with emotions, negotiations, social intelligence, creating self-image, and intellectual property. The training sessions gathered 95 participants altogether. The project also allowed to, and this was one of the crucial aims of allocating the funds, raise the quality of MSc and PhD students’ education by augmenting the CAS didactic offer with new special lectures. Consequently, a total of 1355 hours of lectures were delivered which were co-financed by EU funds, whereas the overall number of participants was 1605.

To sum up, the past six years of carrying out the project was, as the team of CAS specialists have unanimously stated, a time laced with challenges and successes. It was a time abundant in meetings with many inspiring people who are full of passion for science and who, with their presence and commitment, have confirmed the rationale and importance of the project. We have been successful in completing the tasks we were assigned in almost 100% and, by collecting opinions and data from the beneficiaries involved in the project, we know that for them it was support of no less importance, for it contributed to innovative paths of research, to publications, fruitful results and scientific topics for future consideration.