

FACES AND PLACES

COLLABORATION

CERN and GSI sign new agreement

CERN and GSI have a long and successful history of collaboration, which started even before CERN launched its programme for fixed-target physics with heavy ions at the Super Proton Synchrotron in the 1980s, culminating with the prospect of collisions between beams of lead ions at the LHC. GSI has made major contributions to the LHC – in particular to the ALICE experiment, which is designed principally for the study of lead–lead collisions.

Now, GSI is to become the host laboratory and major partner for the Facility for Antiproton and Ion Research, which is scheduled to start construction at Darmstadt next year.

CERN and GSI have decided to continue as well as strengthen their co-operation in the fields of heavy-ion and hadron physics, accelerator physics and technologies, educational programmes and high-performance computing.

On 14 April GSI's director, Horst Stoecker,



Left to right: Hartmut Eickhoff, Horst Stoecker and Rolf Heuer shake hands on the new agreement.

and CERN's director-general, Rolf Heuer, signed a newly enlarged agreement to enhance the co-operation between the two

laboratories. The agreement was also signed by the two accelerator directors, Hartmut Eickhoff for GSI and Steve Myers for CERN.

ITU and CERN strengthen their relationship

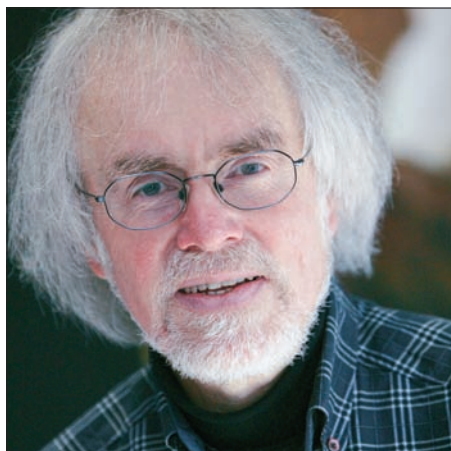
On 10 May CERN and the International Telecommunication Union (ITU) signed a framework agreement that is intended to strengthen the collaboration between the two organizations on scientific and technological issues. The ITU is the leading UN agency for information and communication technology issues. For nearly 145 years it has co-ordinated and promoted international co-operation in telecommunications, from the shared global use of the radio spectrum to efforts to improve telecommunications infrastructure in the developing world and to strengthen cybersecurity.

The agreement will facilitate the setting up and implementation of joint initiatives that are of mutual interest. These are expected to concern the following fields in the near future: citizen cyberscience; the extension of broadband-communication systems to developing countries; training in the use of "digital library" methods in these countries; and cybersecurity.



Hamadoun Touré, secretary-general of the ITU and Rolf Heuer, CERN's director-general, have signed a co-operation agreement on scientific and technological matters. (Courtesy ITU.)

LEARNED SOCIETIES



Andrzej Buras. (Courtesy facesbyfrank.)

Buras elected to the Bavarian Academy of Sciences

Andrzej Buras, professor of theoretical elementary particle physics at the Technische Universität München (TUM), has been elected to the Bavarian Academy of Sciences. A leading researcher in applied quantum-field theory, in particular in flavour physics, he is head of the Fundamental Physics Group at the Institute for Advanced Study at TUM and leader of a research area in the Excellence Cluster "Origin and Structure of the Universe".

Buras is elected on the basis of his studies of strong-interaction (QCD) effects in deep-inelastic processes (the modified minimal subtraction, or $\overline{\text{MS}}$ -bar, scheme, with William Bardeen, Dennis Duke and Taizo Muta); calculations of higher-order QCD effects in weak and rare meson decays; and numerous studies of rare decays and CP violation within the Standard Model and several of its extensions.

The Bavarian Academy of Sciences and Humanities was founded in 1759 and counts Johann Wolfgang von Goethe, Werner Heisenberg and Albert Einstein among its past members. It has two sections, or "classes" – one for philosophy and history and one for mathematics and the natural sciences. The number of ordinary members in each class is limited to 45. Julius Wess was the only particle physicist to be a member, until his death in 2007.

APPOINTMENT

Arturo Menchaca becomes president of the Mexican Academy of Sciences

Arturo Menchaca, of the Instituto de Física de la Universidad Nacional Autónoma de México and a member of the ALICE collaboration at the LHC, is the newly appointed president of the Mexican Academy of Sciences (AMC).

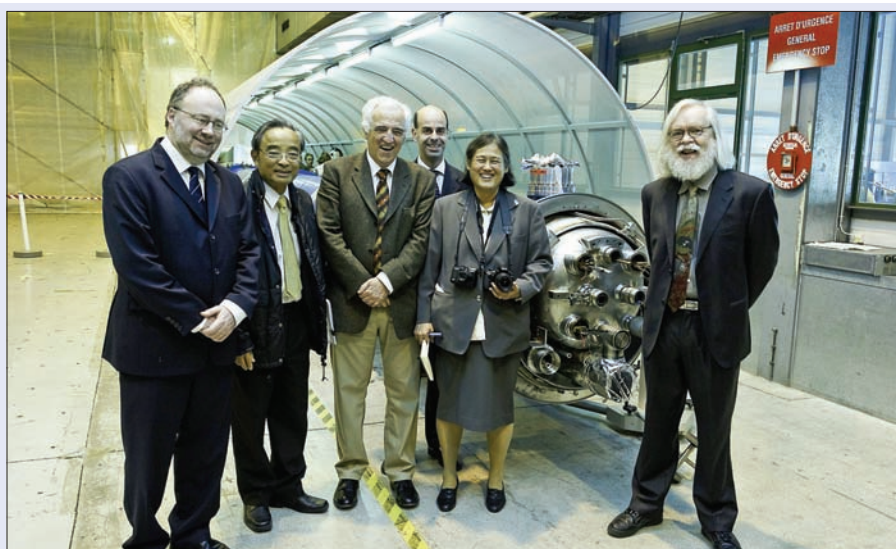
The AMC promotes communication between the national and international scientific communities, advises the Mexican state on issues in science and technology and promotes the development of research in these fields in Mexico. The AMC membership numbers about 2000 and consists of leading Mexican scientists, as well as some 80 scientists from other countries, including nine Nobel laureates.

During his mandate Menchaca aims at strengthening international relations and build up the AMC's participation in the scientific academies of the G8+5 countries, as well as in other organizations.



Arturo Menchaca. (Courtesy Enrique Siqués.)

VISITS



Her Royal Highness Princess **Maha Chakri Sirindhorn** of the Kingdom of Thailand, second from right, came to CERN on 13 April. During her visit she toured the LHC superconducting magnet test hall accompanied by, from left to right, Albert de Roeck, CMS deputy spokesperson, **Pairash Thajchayapong**, attached to the office of His Majesty's principal private secretary, Frédérick Bordry, head of CERN's technology department, Emmanuel Tsesmelis, adviser for South-East Asia, Oceania, Cyprus, Malta and Iceland, and John Ellis, adviser for non-member states.

CELEBRATION

Jiří Niederle: a voice for science and CERN

Jiří Niederle, CERN Council member for the Czech Republic, celebrated his 70th birthday in 2009. A well as being a respected theoretical particle physicist, he has been instrumental in building the scientific reputation of Czechoslovakia and, subsequently, the Czech Republic.

A native of Prague, Niederle studied in the Faculty of Technical and Nuclear Physics of the Czech Technical University in his home city. After graduating, he joined the Institute of Physics of the Czechoslovak Academy of Sciences, also in Prague, and followed his PhD studies both there and at the International Centre for Theoretical Physics (ICTP), in Trieste. In 1967 he became a research scientist at the institute and, after defending his thesis on “Generalized Symmetries of Space-Time and their Application to Elementary Particle Physics”, he became associate professor.

Over the years Niederle has made important contributions both to particle physics and mathematical physics. In particle physics he has concentrated on theories that unify fundamental particle interactions, conformal quantum field theory, gauge formulations of gravitation, and the symmetry of elementary particles. In mathematical physics he has solved problems related to the representation theory of Lie algebras and superalgebras and their corresponding groups and special functions, integrable non-linear systems, and the theory of contractions and deformations.

However, Niederle’s influence on science extends beyond his contributions to theoretical physics. Science has always been one of the first fields to penetrate the artificial political barriers that separate individual countries and prevent free scientific contacts and circulation of scientists. After the collapse of the communist regime in Czechoslovakia in November 1989, a radical reconstruction of the organization of international contacts and co-operation in science was unavoidable, both in the Academy of Sciences and in the country’s universities. The enormous challenge that such a reorganization entailed fell to Niederle, who was president of the Council for International Co-operation of



Hoisting the flag when Czechoslovakia became a full member of CERN in 1992. From left, Jiří Niederle, Carlo Rubbia, CERN director-general, Zdenko Pírek, Foreign Affairs Deputy Minister of Czechoslovakia, and William Mitchell, president of the CERN Council.



Jiří celebrating his 70th anniversary in 2009. (Courtesy J Niederle.)

the Academy of Sciences. While in this position in 1990–1997 and in 2001–2005 he was able to help the academy to become a top scientific institution and to find its place in the community of world scientific organizations, despite the previous 40 years of communist isolation.

Niederle also contributed in a decisive way to his country’s membership in CERN, initially as Czechoslovakia (in 1992) and later as the Czech Republic (1993). As president of the Czech Committee for Co-operation

with CERN, a position he has held since 1992, he has rendered outstanding service in support of the collaboration of the Czech Academy and Czech universities with CERN. He has been a member of the CERN Council since 1992, and was its vice-president in 1996–1998. He was also the first Czech delegate to the NATO Science Committee, in 1994–1995.

An experienced lecturer, Niederle gave lectures at ICTP and at the International School for Advanced Studies in Trieste from

1964 until 1979, and wrote the three-volume work *Group Theory* aimed at students. He has also been visiting professor and presented many invited lectures at institutes in both Europe and the US. His communication skills are not limited to academic circles – he successfully writes and gives interviews in popular science, covering topics from special relativity and quantum mechanics to the construction and work on the Large Electron Positron collider and its successor, the LHC. He is very active in broadcast popular science programmes, such as *Keys to knowledge*, a

five-part TV programme that won a prize for popularization. He has also made successful TV programmes about CERN and the activities of Czech experts at CERN.

Niederle has been a member of several scientific societies and associations. For example, he was a founding member of the International Association of Mathematical Physics and for many years was an elected member of the council of the European Physical Society. He has been a member of the Czech branch of the Club of Rome since 1991 and was a founding member of the

Euroscience Association. He was a member of the Subcommittee for Research and Education of the Parliament of the Czech Republic in 1995–1998 and now sits on the scientific councils of a number of Czech universities and on the editorial boards of seven scientific journals.

In 1995 Niederle was appointed professor of theoretical physics at Charles University, Prague, and in 1999 he became head of the Department of the Theory of Elementary Particles of the Institute of Physics at the Academy of Sciences of the Czech Republic.

MEETINGS

The **5th International Accelerator School for Linear Colliders** will take place at Villars-sur-Ollon, Switzerland, on 25 October – 5 November 2010. Organized by the International Linear Collider Global Design Effort, the Compact Linear Collider study and the International Committee for Future Accelerators Beam Dynamics Panel, the school is hosted by CERN and sponsored by a number of funding agencies and institutions. The first two days of the 10-day programme will be an introductory course with an overview of TeV-scale lepton colliders. This will be followed by two elective courses,

one on accelerator physics and the other on RF technology. The school will accept a maximum of 70 students from around the world. Students will receive financial aid covering their expenses for attending the school including travel (full or partial). There will be no registration fee. The application deadline is 15 June. For more details, see www.linearcollider.org/school/2010.

The **6th International Workshop on the CKM Unitarity Triangle** will take place at the University of Warwick, UK, on 6–10 September. The CKM workshop

provides the opportunity for theorists and experimentalists in quark-flavour physics to discuss results and develop new ideas. The meeting will feature results from the Tevatron, B factories and charm and kaon experiments, the status of preparations for next generation experiments, and first results from the LHC. There will be reports on the latest progress in lattice QCD calculations and on the development of techniques that enable ever more precise determinations of the elements of the CKM matrix. For more details about CKM2010, and on-line registration, see <http://ckm2010.warwick.ac.uk>.

LETTERS

The LHC and cosmic rays

Very recent measurements at the LHC show that the charged-particle density in the central rapidity region is following a simple power law in energy all of the way from as low as 10 GeV up to 2.6×10^7 GeV laboratory energy (ALICE collaboration 2010, see also page 6). Specifically the power law exponent, $\alpha = 0.11$, is the same as that found for laboratory energies $1.5 \times 10^3 - 1.5 \times 10^5$ GeV (Erlykin 1983) and close to $\alpha = 0.13$ found at even lower energies $10 - 1.5 \times 10^3$ GeV (Wdowczyk and Wolfendale 1979).

There is immediate relevance to the nature of the famous “knee” in the primary cosmic-ray energy spectrum around 3×10^6 GeV, because it is the first time that measurements cover interactions at these and even higher energies. The preservation of that rate of rise for the charged-particle density means that drastic changes in the “nuclear-physics model” of the knee cannot be invoked. Conventional astrophysical models – with no change in

interaction mechanism – suggest light nuclei (protons and helium) from a local single supernova as being responsible.

ALICE collaboration 2010 arxiv:1004.3514.
A D Erlykin 1983 *Proc. Int. Cosm. Ray Conf. Bangalore* **5** 1.

J Wdowczyk and A W Wolfendale 1979 *Nuovo Cim.* **54A** 433.

A D Erlykin and A W Wolfendale.

Krisch and cross-sections

I am a great admirer of Alan Krisch and I was delighted to see the article about him in the *CERN Courier* of April 2010. I think that all of those like Krisch, or, at CERN, Louis Dick, who had the courage to investigate polarization phenomena without the support of most of the theoretical community have great merits. Their surprising results remain largely unexplained, and many theoreticians say that these results are not really interesting. Indeed perturbative QCD is unable to say anything about these because the transition

from quarks and gluons to hadrons is poorly understood. For this reason, at CERN, several proposals of experiments with polarized particles have been rejected. I am not sure that this is a very scientific attitude.

I would like to make a historical correction to the statement, that it is in Krisch's papers of 1967 and 1968 that the notion of “inclusive cross-section” was introduced. As early as 1961 it was realized that with electron linacs one could only get inclusive cross-sections. For electron and neutrino inclusive cross-sections, Fubini, Gourdin and I, and, independently, Bjorken found that these processes could be described by respectively two and three functions later called “structure functions”. Also, in the purely hadronic case, Ascoli and Minguzzi, in 1960, defined the cross-section for production of a particle at a given angle, i.e. the inclusive cross-section integrated over the energy of this particle.

André Martin, CERN.

AWARD

Dolgov and Sobel receive the 2009 Pontecorvo Prize

The Pontecorvo Prize for 2009 goes to Alexander Dolgov of the Institute for Theoretical and Experimental Physics, Moscow, and Henry Sobel of the University of California, Irvine. Dolgov receives the prize for his fundamental work on neutrino oscillations and kinetics in cosmology, while Sobel is honoured for his significant contributions to experiments in neutrino oscillations.

The awards ceremony was held on 19 February at the 107th session of the JINR Scientific Council. Alexei Sissakian, director of JINR, presented the prize certificates and



From left to right: Prizewinners Henry Sobel, Alexander Dolgov with JINR director Alexei Sissakian.

badges of honour. (Sissakian very sadly passed away on 1 May, see p32.)

Dolgov and Sobel presented the experimental results based on the ideas

postulated by Bruno Pontecorvo. Both of them noted that it was a great honour to be awarded with a prize named after one of the 20th century's most outstanding physicists.

NEW PRODUCTS

Agilent Technologies has introduced the U1084A PCIe high-speed digitizer with an on-board field-programmable gate array for real-time data processing. This platform provides higher sampling rates, faster measurement throughput and more flexibility, while maintaining precision and cost-effectiveness. The product's PCIe form factor and flexible architecture are ideal for use in scientific instrumentation. The digitizer's performance is also suited to advanced research in high-energy physics, nuclear physics and astrophysics. For further details, e-mail digitizers@agilent.com; or visit www.agilent.com/find/advanced-research.

Elma Electronic Systems Division has announced the 6211 cPCI RAIDStor with up to 1.2 TB in a single cPCI slot or 2.4 TB with two slots. The new 6U CompactPCI blade network attached storage board provides automatic and transparent cross-network or intra-blade data replication and re-sync for enhanced data security and preservation. Standard with dual 2.5-inch SATA hard-disk drives, the new RAIDStor also comes in lower capacity configurations. For more information, contact Valerie Andrew, tel +1 215 956 1200; fax +1 215 956 1201; e-mail sales@elma.com; or visit their website at www.elma.com.

Lake Shore Cryotronics Inc has introduced

the Model 425 gaussmeter. Designed to meet the needs of the permanent magnet industry, the Model 425 provides high-end functionality and performance in a desktop instrument. Additional features, which include DC to 10 kHz AC frequency response, maximum hold and relative measurement, make the Model 425 useful for manufacturing, quality control and R&D flux density measurement applications. For further details, tel +1 614 891 2244; fax +1 614 818 1600; e-mail info@lakeshore.com; or visit www.lakeshore.com/mag/ga/gm425po.html.

Maxon Motor Ag has announced the EPOS2 70/10, a positioning system developed specifically for commanding and controlling in the CANopen network. USB and RS232 are also available as further communication interfaces. The EPOS2 70/10 matches with DC brush motors with encoder, or with brushless EC motors with Hall sensors and an encoder with up to 700 W of power. It features high-precision motion control functionalities and offers a dual-loop position and speed controller. For more information, tel +41 666 1500; fax +41 666 1650; e-mail info@maxonmotor.com; or visit their website at www.maxonmotor.com.

UltraVolt Inc has introduced a new line of benchtop high-voltage power systems, the

BT series. Standard features include a clear output-voltage display, power grid input, positive or negative polarity, tight line/load regulation, low ripple, high stability, overload protection and optional shielded HV output cable. The BT series systems are single channelled and have output voltages from 0–100 V up to 0–6 kV. UltraVolt has also announced that the V series and M series of microsize, micropower products have been enhanced with power levels increased by up to 50%. These modules are now offered at 500 mW with 12 V input, 800 mW with 15 V input, or 1 W with 24 V input for all output voltage ranges. For more information, tel +1 631 471 4444; or visit www.ultravolt.com.

Unitemp has introduced a new range of easy-access temperature and humidity chambers, designed for the testing and monitoring of electronics and semiconductors, for example. The control panel incorporated in the door allows easy access to the specimen under test through cable ports located on both sides of the equipment. The series has a temperature range of –40°C to +150°C and 20–98% RH. The control panel allows 20 program patterns to be stored in memory. For further details, contact Paul Brown, tel +44 162 885 0611; e-mail paul@unitemp.co.uk; or visit their website at www.unitemp.co.uk.

OBITUARIES

W Owen Lock 1927–2010

Following a long and cruel illness, which he and his family bore with great fortitude, Owen Lock died on 19 March 2010.

Owen was born on 8 August 1927 and grew up in Cirencester, England. In 1945 he won a state scholarship to study physics at the University of Bristol, where he graduated in 1948 with a first-class honours BSc. He joined the international group of Cecil Powell and colleagues, immediately after their Nobel prize-winning discovery of the π meson, and worked with the newly developed technique of photographic nuclear emulsions, which were exposed to cosmic rays in high-altitude balloon flights. Owen's numerous papers from that time include observations of the production and decays of μ , π and K mesons and their interactions with nuclei. He wrote a review article in *Progress in Cosmic Ray Physics* in 1951 and obtained his PhD in 1952. By then he had been, successively, secretary and chair of the Bristol branch of the Association of Scientific Workers and had joined the World Federation of Scientific Workers and the British Pugwash Movement.

Owen met his wife, Eleanor, in Bristol. They were married in 1952 and moved to Manchester, where Owen took up a research fellowship, working with Patrick Blackett on further investigations of K mesons. After five months he became a lecturer at the University of Birmingham in 1953. In addition to lecturing in the physics and extra-mural departments, he formed a group to expose nuclear emulsions to beams at the university's newly constructed 1 GeV proton cyclotron. There followed a rich series of papers on proton interactions with matter and the nuclear disintegrations they provoke. While in Birmingham he wrote a book, *High Energy Nuclear Physics*, which was subsequently translated into Russian, French and Polish.

Having savoured the rich, international atmosphere of Powell's group in Bristol, Owen was attracted by CERN. He was awarded a research associateship in 1959, which led to a staff appointment in 1960, when he took over the joint leadership of the Nuclear Emulsion Group in the nuclear physics division. He was responsible for organizing the exposure of emulsions to beams from



W Owen Lock – a rare organizational talent.

the Proton Synchrotron (PS), in conjunction with groups from all over Europe and beyond. He became, in turn, PS physics co-ordinator, secretary of the Emulsion Experiments Committee and secretary of the Nuclear Physics Research Committee. He initiated and organized the first Easter School for emulsion physicists, held in St Cergue in 1962 and repeated in 1963. This became the CERN School of Physics, held each year in a different CERN member state. Owen was subsequently responsible for the school's becoming a joint venture with JINR, Dubna, which was then in the USSR. Starting in 1970, the school was hosted alternately in eastern and western Europe.

The breadth of his human contacts and his rare organizational talent led Owen to transfer to the personnel division in 1965 to become head of the Fellows and Visitors Service. Already in 1962 he had started organizing conferences and in 1966 he became head of the Scientific Conference Secretariat and secretary to a working group, chaired by the director-general Bernard Gregory, on the European Space Research Organization (a forerunner of ESA). In 1970 he was appointed head of Education Services and deputy to

the PE division leader until 1977, when he became personal assistant to John Adams, who was then executive director-general (at the time when Léon Van Hove was research director-general). He also became secretary of the board of directors and of the management board. He guaranteed continuity in this respect because he also fulfilled these roles under two subsequent directors-general, Herwig Schopper and Carlo Rubbia.

As early as 1965, Owen had accompanied Bernard Gregory to Moscow to negotiate an agreement with the State Committee for Atomic Energy on collaboration between the new Institute for High Energy Physics, in Protvino, and CERN. First contacts with China followed under Willibald Jentschke in 1971, which resulted in a visit by a Chinese delegation to CERN in 1973 and return visits in 1975 and 1977. These contacts led to co-operation agreements with China, signed by John Adams in 1979 and by Herwig Schopper in 1981 and 1985, during visits where Owen was the link-person. In 1976, the International Council of Scientific Unions founded what, in 1978, became the International Committee for Future Accelerators with John Adams as chairman and Owen as secretary. Under Carlo Rubbia, Owen became responsible for relations with central and eastern Europe, in addition to his ongoing contacts with China and India, which continued until his retirement in 1992. He was largely responsible for five countries acceding to full membership of CERN: Finland, Poland, Hungary, the Czech Republic and Slovakia.

Owen was highly educated and widely read, yet a modest person. Complementing his outstanding contributions to physics and scientific co-operation, he possessed deep convictions that led him to weld human contacts and friendships, encompassing people throughout the world. To his family and to those of us who experienced his generosity and had the privilege of being guided by him, an era has ended and we feel the loss. Our sympathy goes to his wife, Eleanor, and his four sons, Nicholas, Adrian, Evan and Eric. *His close friends.*

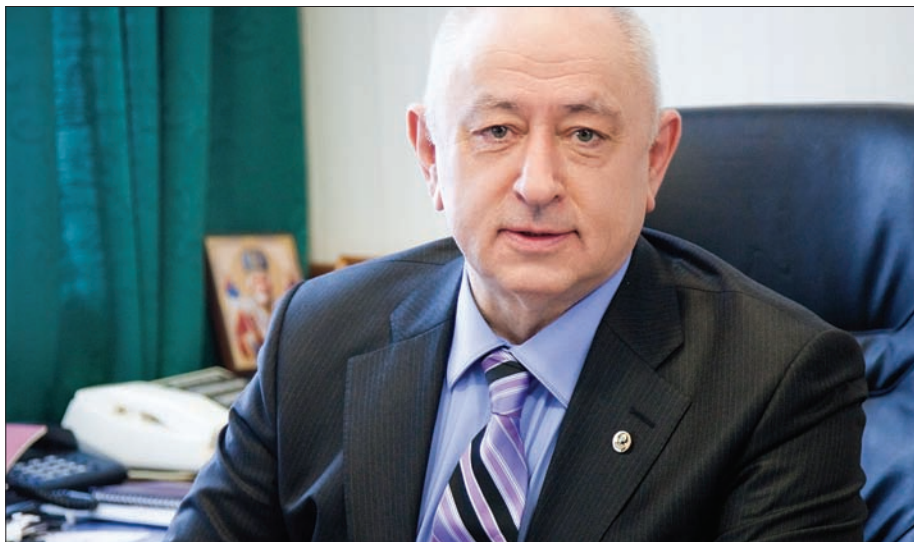
Alexei Norairovich Sissakian 1944–2010

Alexei Norairovich Sissakian, the director of JINR, a member of the Presidium of the Russian Academy of Sciences, a distinguished theoretical physicist and an organizer of scientific research based on broad international co-operation, passed away on 1 May aged 65. He had been elected for his second term as director of JINR in March.

Alexei Sissakian was born on 14 October 1944 in Moscow. In 1968 he graduated from the physics faculty of the M Lomonosov Moscow State University and started work at the JINR Laboratory of Theoretical Physics in Dubna under the guidance of Nikolay Nikolaevich Bogoliubov. Sissakian's main scientific work concerned elementary particle physics, approximation methods and equations of quantum field theory, the quantization problem of systems with nontrivial geometry, symmetry and topology, and the physics of strong interactions at high temperatures and densities.

In quantum field theory, Sissakian and colleagues offered a new description of processes with large momentum-transfers within the 3D approach to quantum field theory and developed a multicomponent approach in the theory of multiple particle production. Under his guidance seminal investigations in the field of mathematical physics were carried out on classical and quantum superintegrable systems in constant curvature space, as well as on the generation of topologically nontrivial objects. In recent years Sissakian and co-workers dealt with the further development of the method of contraction of Lie algebras applicable for theoretical physics problems.

Studies by Sissakian's research group were widely recognized in one of the most topical problems of particle physics – the development and application of nonperturbative methods in quantum field theory and the development of new approaches to very high multiplicity processes. Under Sissakian's leadership, novel and promising investigations took place to search for processes in the formation of a mixed quark-hadron phase of nuclear matter in heavy-ion collisions. He initiated and led JINR's largest project for the construction of a heavy-ion collider – the Nuclotron-based



Alexei Sissakian, who had just begun his second term as director of JINR. (Courtesy JINR.)

Ion Collider Facility (NICA) – to study phase transitions and critical phenomena in nuclear matter (*CERN Courier* January/February 2010 p13).

Under Sissakian's leadership a very fruitful collaboration developed between JINR and CERN in preparing many experiments at the Large Electron Positron collider and the LHC. As a member of the ATLAS collaboration, he did much to strengthen the collaboration between JINR and CERN team members.

Sissakian always combined his active research work with pedagogical and organizational activities in science. He supervised 15 theses, was head of the chairs at Moscow Institute of Physics and Technology and Moscow Engineering Physics Institute, was a professor at the M Lomonosov Moscow State University, the vice-president of the International University "Dubna" and had the chair in theoretical physics. In addition he led the scientific seminar "Symmetries and Integrable Systems" at JINR.

Sissakian was the editor-in-chief of *Physics of Particles and Nuclei Letters*, a deputy editor-in-chief of *Physics Particles and Nuclei* and a member of the editorial boards of several scientific publications. He was also a member of specialized scientific councils and programme committees of international conferences and symposia, and the organizer of major international conferences and

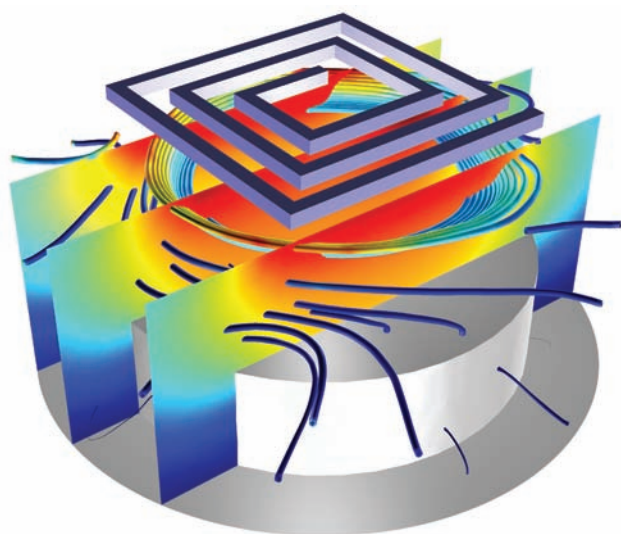
schools on particle physics.

As vice-director of 1989–2005 and director of JINR since 2006, Sissakian made invaluable contributions towards maintaining and enhancing the potential of the institute, determining its future scientific prospects, improving its research and production capacity, renovating the institute as an open international nuclear physics laboratory, promoting broad co-operation with national and international research and educational centres, and training qualified scientific personnel.

Sissakian was elected a corresponding member of the Russian Academy of Sciences in 2006 and a full member of the academy and a member of its presidium in 2008. As president of the Union of Russian Science Cities, he actively participated in the establishment of science cities. He was also first deputy chairman of the Russian Pugwash Committee under the Presidium of the Russian Academy of Sciences.

Since school age his favourite hobby was poetry. He was the author of several collections of fine poems.

Alexei Norairovich was always distinguished by his dedication to science, by a wonderful combination of great will power with kindness and sympathy to his relatives, friends, colleagues, indeed to all people. *JINR Directorate, his colleagues and friends.*



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