

PEOPLE

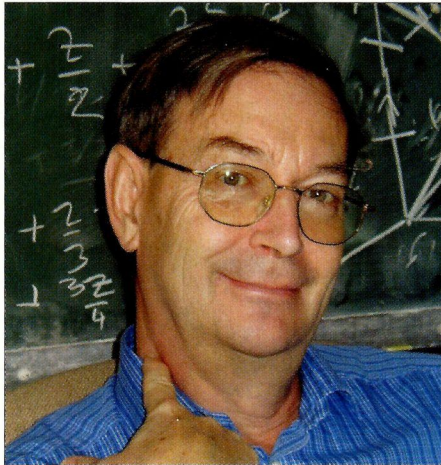
APPOINTMENTS

Zinn-Justin becomes head of DAPNIA

Jean Zinn-Justin has succeeded Michel Spiro as head of the Department of Astrophysics, Particle Physics, Nuclear Physics and Associated Instrumentation (DAPNIA) at the Saclay laboratory of the French Atomic Energy Commission (CEA).

A theoretical physicist, who joined the theoretical physics service of the CEA in 1965, Zinn-Justin has worked principally on quantum field theory and its applications in particle physics and in the statistical mechanics of phase transitions. He led the theoretical physics service from 1993 to 1998.

Zinn-Justin has been a visiting scientist in many research centres and universities,



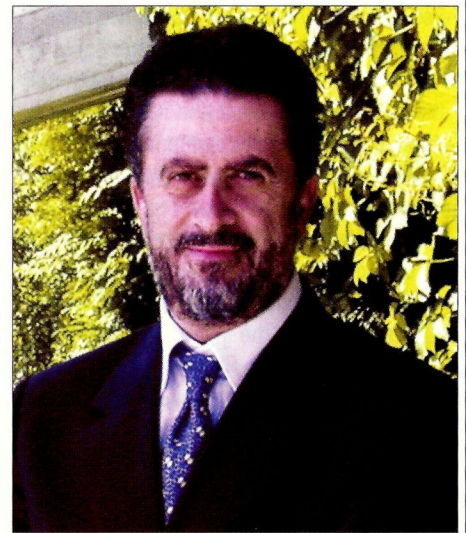
including CERN, MIT and the universities of Stony-Brook, Princeton and Harvard. He is editor of several scientific journals and is a member of numerous scientific committees, both in France and elsewhere. As a teacher, between 1987 and 1995, he was director of the Les Houches Summer School and co-organizer of the courses.

Zinn-Justin is the first theoretician to become director of DAPNIA. However, having participated on scientific committees for the astrophysics and particle physics services of DAPNIA for many years, he will be working with the department's experimenters in an environment he knows well.

New director for the INFN Gran Sasso National Laboratory...

Eugenio Coccia is the new director of the INFN National Laboratory of Gran Sasso, the world's largest underground laboratory for astroparticle physics. Coccia, who is full professor of gravitational physics at the Physics Department of the Faculty of Science of the University of Rome Tor Vergata, succeeds Alessandro Bettini at the end of his six-year mandate. Coccia has carried out research mainly at CERN and the INFN National Laboratories of Frascati, working on the real-

ization of the cryogenic detectors EXPLORER and NAUTILUS, which are currently the most sensitive gravitational wave detectors in continuous operation. Prior to this appointment, he was chairman of the Scientific National Committee for Astroparticle and Neutrino Physics of the INFN, and is the current president of the Italian Society of General Relativity and Gravitational Physics. Coccia, who took over on 16 June, will be director at Gran Sasso for the next three years.



...and for the Instituto de Fisica at UNAM

Arturo Menchaca, a leading Mexican experimentalist and member of the ALICE collaboration at the Large Hadron Collider, has recently been appointed as director of the Instituto de Fisica of the Universidad Nacional Autonoma de Mexico (UNAM). The Instituto de Fisica at UNAM has the largest concentration of physicists in Mexico, with approximately 100 post-docs and around 115 graduate students, and plays an essential role in the education and training of the country's physicists.



Willibald Jentschke commemorative issue

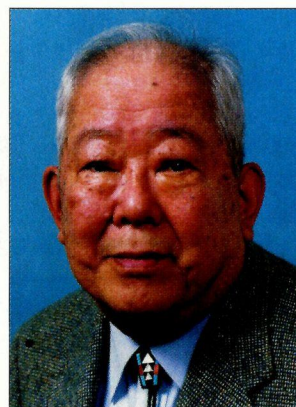
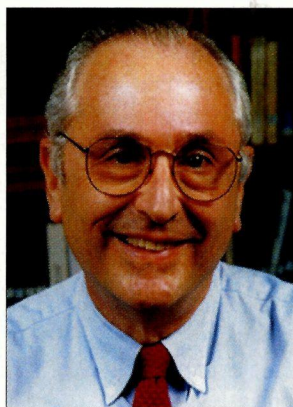
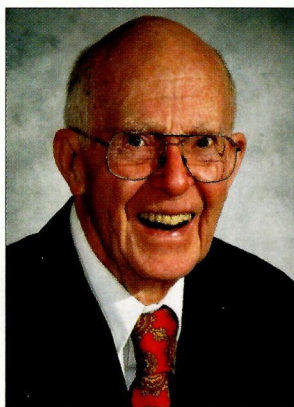
A special issue of *CERN Courier*, dedicated to the memory of Willibald Jentschke, has just gone online at the *CERN Courier* website (www.cerncourier.com – click on “Special Issues”). A limited number of paper copies will be available on a first-come first-served basis from the CERN library. To request a copy, fill in the form at: <http://weblib.cern.ch/publreq.php>, or write to CERN Scientific Information Service, CERN, 1211 Geneva 23, Switzerland.

PRIZES

Neutrino physicists pick up awards

The Franklin Institute in Philadelphia has awarded its 2003 Benjamin Franklin Medal in Physics to three pioneers of solar neutrino physics. John Bahcall of the Institute for Advanced Study, Princeton, Raymond Davis of the Brookhaven National Laboratory and the University of Pennsylvania, and Masatoshi Koshiba of the University of Tokyo, have received the medal for work that led to an understanding of neutrino emission from the Sun. Bahcall performed some of the earliest research in this area and provided the theoretical basis for the experimental work of Davis, in his pioneering detector in the Homestake gold mine, and then Koshiba, who led the design and construction of the Kamiokande neutrino observatory. Bahcall is also a winner of the 2003 Dan David prize. The prize, which is funded by auto photo-booth developer Dan David, makes awards for past, present and future "time dimensions". Bahcall's award is in the Future Time Dimension category, in the field of cosmology and astronomy.

On 13 May, the Markov prize was presented to Tom Bowles from Los Alamos National Laboratory, and Vladimir Gavrin and Vadim Kuzmin, both from the Institute for Nuclear Research (INR) of the Russian Academy of Sciences. The Markov prize was established last year by the INR as a memorial to Moisey Alexandrovich Markov, one of the founders of the INR, with its Baksan and Baikal neutrino observatories. This year the prize was presented in acknowledgement of contributions to research on the solar neutrino problem.



Medal winners Raymond Davis (left), John Bahcall (centre) and Masatoshi Koshiba.



Markov prize winners (from left) Vadim Kuzmin, Tom Bowles and Vladimir Gavrin, together with the first director of the INR, Albert Tavkhelidze, and its current director Victor Matveev.

Gavrin and Bowles are, respectively, the Russian and American co-principal investigators of SAGE (Soviet-American Gallium Experiment), which has been in operation at

Baksan since 1987, while Kuzmin was, in the 1960s, the first person to suggest gallium as a target for solar neutrinos produced in proton-proton fusion reactions.

NEW PRODUCTS

Integrated Engineering Software (IES)

has recently unveiled the V6.1 release of its two-dimensional low-frequency electric and magnetic field solvers, which now incorporate new technology solvers that are based on FEBEM, a hybridized finite element (FEM) boundary element (BEM) method. Users can select between FEM, BEM or the FEBEM hybrid mode. For further information, tel: +1 204 632 5636, fax: +1 204 633 7780, or e-mail: info@integratedsoft.com.

Thales Computers has announced a new PCI mezzanine card, the PMC-PIO. The card provides 64 channels of 3.3 V (5 V compatible) parallel I/O, which can be independently programmed as input or output. The company is also offering a new shortform catalogue. For more details and a free copy of the catalogue, see www.thalescomputers.com, tel: +1 800 848 2330, or fax: +1 919 231 8001.

Acqiris has introduced a new 21-slot crate that enables high-speed digitizer systems with up to 80 channels to be configured in a single 19" wide, 9U high rack. Acqiris has also devel-

oped a new family of PCI 12-bit ADC digitizer cards that feature a high level of throughput. The DP310 has a sampling rate of up to 400 MS/s, while the DP306 and DP308 sample at up to 100 and 200 MS/s, respectively. More details are available at www.acqiris.com.

FIZ Karlsruhe has launched a new defensive publication database on the online service STN International. RDISCLOSURE contains over 27 000 records, with full text and images, and covers inventions from all areas of science and technology since 1960. For further information see www.fiz-karlsruhe.de.

PRIZES

DESY acknowledges young physicists

David Milstead from the University of Liverpool has received the DESY communication award, which was presented to him on 23 April by Erich Lohrmann. Milstead won the €1000 prize for the film "Chasing the Magnetic Monopole" that he produced last year in collaboration with a BBC television team. The film provides an insight into Milstead's life as a young physicist looking for magnetic monopoles at the H1 experiment at HERA. The award is presented by the Association of Friends and Sponsors of DESY to young scientists who have an excellent capability to give an understanding of their work to a scientifically interested audience.

DESY's PhD thesis prize has this year been awarded, for work carried out at HERA, to Lara De Nardo and Oscar González López. De Nardo, from the University of Alberta, received the prize for her thesis on "Measurement of the structure function g_1^d at HERMES and extraction of polarized parton distributions", which was carried out at the HERMES experiment at HERA. On the basis of her measurement of the spin structure function of the



David Milstead (left) receives the DESY communication award from Erich Lohrmann.

deuteron – the most precise so far – De Nardo carried out an impressive theoretical analysis of all previous measurements and came to the conclusion that the gluons very probably contribute a large positive amount to the spin of the proton. González López from the Universidad Autonoma de Madrid was



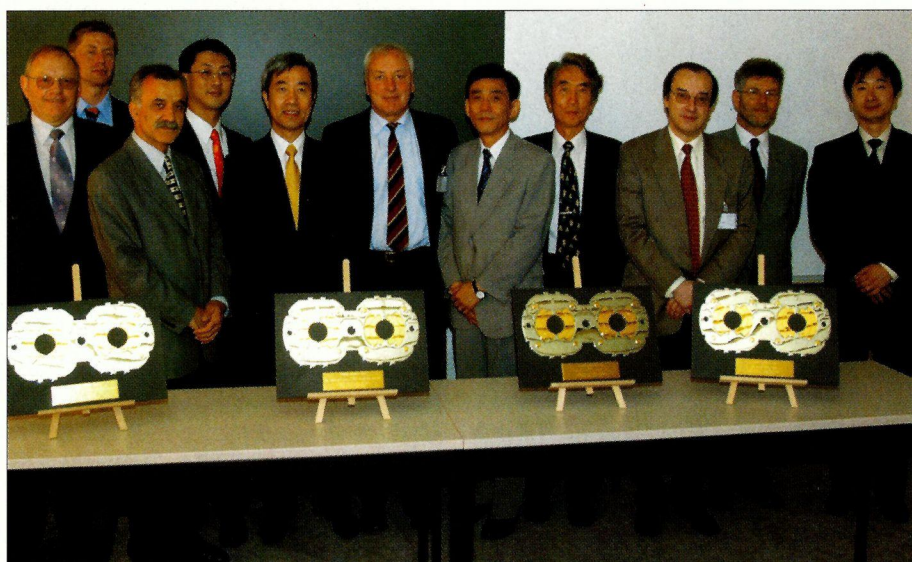
DESY's PhD thesis prize winners Lara De Nardo (left) and Oscar González López (right) with Erich Lohrmann.

awarded the prize for his thesis on "Precise determinations of the strong coupling constant at HERA". This was based on a new, precise measurement of the coupling constant carried out at the ZEUS experiment, which provides a very precise and methodically "clean" verification of quantum chromodynamics.

CERN

LHC suppliers receive Golden Hadron awards

In a ceremony at CERN on 16 May, three companies received CERN's "Golden Hadron" awards for 2003. The awards, for the LHC project's best suppliers, were presented not only for technical and financial achievements, but also for compliance with contractual deadlines. The Furukawa Electric Company from Japan won its award for delivering some 575 km of superconducting outer cable, representing a whole octant of the LHC ring. The Belgian firm JDL Technologies distinguished itself by developing a cable inspection system by image analysis, which detects the slightest defect in a cable in real time. IHI (Japan)–Linde Kryotechnik (Switzerland) received its award for manufacturing four 1.8 K refrigeration units for the LHC cryogenic system. Based on a unique advanced cold-compressor technology, each unit has a cooling power of 2400 W.

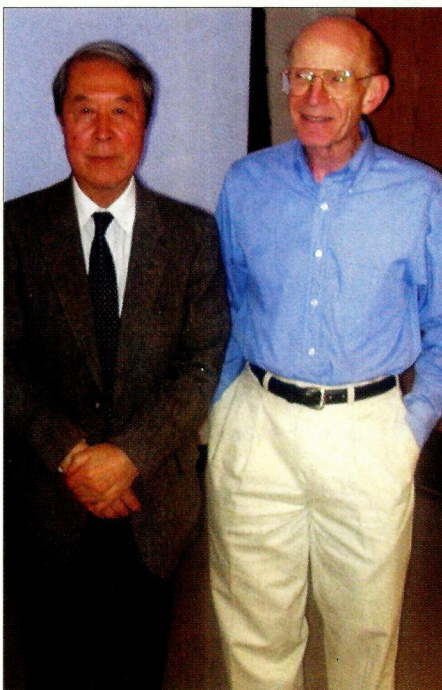


Representatives of the companies who have received the 2003 Golden Hadron awards, together with Lyn Evans (centre), the LHC project leader, who made the presentations.

'Wallyfest' in Maryland and 'Joefest' in Syracuse

To celebrate the 70th birthday of OW "Wally" Greenberg (right of picture) on 9 May, the University of Maryland hosted a "Wallyfest", a symposium on "Quarks, Statistics and Colour". Speakers included Dan Zwanziger, on non-perturbative QCD; Carl Bender, on PT symmetry in quantum mechanics; Gabriel Karl and Yoichiro Nambu (left of picture) on colour and related topics; Alan Kostelecky, on Lorentz and CPT violation; and Masud Chaichian, on non-commutative quantum field theory.

Meanwhile, the University of Syracuse celebrated the 65th birthday of Joe Schechter with a "Joefest" on 13–15 May, which was attended by many distinguished theoretical physicists, including Robert Jaffe, Susumu Okubo and Lincoln Wolfenstein, as well as many of Schechter's former students, post-docs and friends. Schechter is well known for his contributions to several areas of particle physics, in particular the origin of neutrino masses, QCD-effective Lagrangeans and current algebra.



TRIUMF's new ISAC-II building, funded by the government of British Columbia, Canada, was formally opened by the premier of British Columbia, **the Honourable Gordon Campbell** (left), on 11 June. The ISAC-II accelerators, now under construction with funding from the Canadian government, will increase the maximum energy of the radioactive ion beams from 1.5 MeV/u to at least 6.5 MeV/u, and their mass range from $A < 30$ to $A < 150$ (*CERN Courier* January/February 2003 p30). Campbell is seen here with **Alan Shotter**, director of TRIUMF. Photo credit: Hapke, TRIUMF.



The Portuguese minister for science and higher education, **His Excellency Pedro Augusto Lynce de Faria** (right), visited CERN on 6 May. He toured various LHC and ATLAS installations, including the hall where the hadron calorimeter is being assembled. Here, the minister shares an amusing moment with **Peter Jenni** (left), spokesman for ATLAS, and **Ana Maria Henriques Correia**, the tile calorimeter group leader at CERN.



On 30 April, **Bjørn Haugstad**, the state secretary of the Norwegian ministry of education and research, paid a visit to CERN, where he toured various installations including the LHC test facility and the ATLAS assembly areas. He also learned about initiatives from CERN and the European Union on Grid technology, in particular CERN's openlab for Grid applications. Here, he is seen (left) at a luncheon given in his honour, hosted by **Carlo Wyss**, CERN's director for accelerators (standing right).



Technology transfer from CERN to medicine was the theme for two visits hosted by **Hans Hoffmann**, director for technology transfer and scientific computing. **Octavi Quintana Trias**, director of the health directorate of the European Commission's Directorate-General for Research, visited on 14 May, and heard about the application of CERN's technologies in medical imaging and hadron therapy. He is seen seated in the left-hand picture with Hoffmann (standing right) and **Juan Antonio Rubio**, CERN's Education and Technology Transfer Division leader. On 19 May, **Maria Rauch-Kallat** (right-hand picture), Austria's minister of health and women's issues, also heard about the spin-offs from CERN for medical applications and toured the assembly areas for the ATLAS experiment.



Members of the Swedish Research Council and the Scientific Council for Natural and Engineering Sciences visited CERN on 26 May. The visit included tours of the LHC magnet test facility, the ISOLDE facility and the ATLAS assembly areas, where there was time for a group photo in front of one of the vacuum vessels for the ATLAS toroid magnet.

MEETINGS

The ICFA Future Light Sources Sub-Panel's **Mini-Workshop on Start-to-End Simulations of X-Ray FELs** will take place at DESY-Zeuthen, Berlin, on 18–22 August. The purpose of this workshop is to discuss and compare results of start-to-end simulations of specified benchmark scenarios. Attendance is by invitation only. For further information, see www.desy.de/s2e.

The International Workshop on Astroparticle and High Energy Physics (AHEP-2003) will take place in Valencia on 14–18 October. The meeting forms part of the activities of the European Science Foundation Neutrino Astrophysics Network, aimed at fostering collaboration on neutrino physics and astrophysics. For further details and online registering, see the conference website at <http://nac15.ific.uv.es/conference/>.

LETTERS

CERN Courier welcomes letters from readers. Please e-mail cern.courier@cern.ch. We reserve the right to edit letters.

Charmonium revisited

We were very pleased to read the article "The eventful story of charmonium singlet states" by André Martin and Jean-Marc Richard (*CERN Courier* April 2003 p17), because we have ourselves been involved in this search for more than a decade. We unsuccessfully searched for the η'_c in our $p\bar{p} \rightarrow \gamma\gamma$ measurements at Fermilab (T A Armstrong *et al.* 1995), and then in the DELPHI $\gamma\gamma \rightarrow$ hadrons measurements at CERN (P Abreu *et al.* 1998). However, we are happy to report that we finally succeeded in our recent measurements of the reaction $\gamma\gamma \rightarrow K_S K\pi$ at Cornell. In two independent measurements – 13.5 fb^{-1} of e^+e^- data using the CLEO II/II.V detector, and 9.2 fb^{-1} data using the CLEO III detector – we successfully identified the η'_c . Our mass for the η'_c is $3643 \pm 4(\text{stat}) \pm 4(\text{syst}) \text{ MeV}$, which makes its hyperfine splitting a bit less drastic than the larger of the two Belle results suggests, but it is still quite unexpected. This result was presented by Z Metreveli at the Philadelphia meeting of the American Physical Society in April (Z Metreveli, CLEO Collaboration 2003). We expect to be able to submit our results for publication soon. Until then, they will of course carry the caveat of "preliminary".

Further reading

P Abreu *et al.* 1998 *Phys. Lett.* **B441** 479.
T A Armstrong *et al.* 1995 *Phys. Rev.* **D52** 4839.
Z Metreveli, CLEO Collaboration 2003 *Bull. Am. Phys. Soc.* **48(2)** 12–17;
www.lns.cornell.edu/public/TALK/2003/TALK 03-8/aps_talk.ps.

Z Metreveli, K K Seth and A Tomaradze, Northwestern University, Evanston, Illinois.

CORRECTION

An error crept into the caption to the picture of particle tracks on page 26 of the June issue. It should have said that the image shows "multiparticle production by 24 GeV/c protons".

OBITUARIES

Vernon Hughes 1921–2003

Vernon W Hughes, well known for his work on precision measurements of elementary particles and the use of polarized electrons and muons in particle physics, passed away on 25 March 2003.

Born in Kankakee, Illinois, on 28 May 1921, Hughes attended Columbia University, where he received an AM degree in 1941. During the Second World War he helped develop radar at the MIT Radiation Laboratory and was one of the co-editors of a volume of the *MIT Radiation Laboratory Series* entitled "Waveforms" – a volume that has been of major significance to the development of the US electronics industry. Hughes then returned to Columbia and received his PhD in 1950. This early work – and in fact much of his life's work – involved investigations of the effects of the interaction of radiation with matter, and in 1950 he and his colleagues discovered the first two-photon transition in atomic spectroscopy.

Hughes' career involved a broad spectrum of studies of physical phenomena, ranging in energy from the very low to the very high. But he consistently maintained the theme of understanding the physics of elementary particles and their interactions at the most fundamental level. He measured the sum of the difference in magnitude between the electron and proton charges to be one part in 10^{19} , and the electric charge on the neutron to be zero, with similar precision.

One area for which Hughes is particularly well known is the study of atomic physics by means of experiments with the most elementary particles. For 30 years he studied the helium and positronium atoms, and made the first observation of the muonium atom in 1960. The latter evolved into precision measurements of the properties of the atom, eventually leading to hyperfine measurements.

These 35 years of experimentation, verifying to a high precision that the muon is indeed a

"heavy electron", provided new avenues into the experimental study of quantum electrodynamics and created a tool to probe the highest energy scales of elementary particle physics.

Hughes was the originator of another field of great importance: the use of polarized electrons in high-energy accelerators. His interest in polarized electron beams began in 1959 and he developed the first polarized source for SLAC. His vision and perseverance led to the first measurements of the spin-dependent structure of the proton and to the historic observation of parity non-conservation in electron scattering from nucleons. More recently, the success of the SLAC Linear Collider experiments in probing the electroweak interaction with polarized electrons colliding with positrons are directly traceable to Hughes' seminal work.

His pioneering work also opened up the field of nuclear physics to investigations with polarized electrons at low-energy accelerators. The first such experiment in the US was performed by Hughes and his collaborators at the Bates linear accelerator, where they observed parity violation in polarized electron-carbon elastic scattering.

Extending the reach of deep inelastic polarized lepton scattering from nucleons, Hughes led a large collaboration at CERN in investigations that employed polarized muons scattering from polarized neutrons and protons. This work was stimulated by the "proton spin crisis", first observed by Hughes and his group, and led to a more complete understanding of the relationship between the nature of the constituents of the proton and its spin.

Most recently, he conceived and led an experiment at the Brookhaven National Laboratory to greatly improve the measurement of the muon anomalous magnetic moment ($g-2$). This quantity embodies our knowledge of the interactions of elementary



particles in one parameter, and has long served as a crucial parameter with which we can test new ideas in particle physics.

Hughes was on the Yale University faculty from 1954 until his retirement in 1991, and was Sterling professor, the highest honour Yale can bestow. He was also chairman of the Physics Department from 1961 to 1966 and presided over a large expansion of the department. Hughes received many honours in his lifetime, including membership of the National Academy of Sciences, an honorary doctorate from the University of Heidelberg, and both the Davisson-Germer Prize in Atomic Physics and the Tom R Bonner Prize in Nuclear Physics of the American Physical Society.

Hughes' focus was always on the most fundamental questions in physics, and his development of ultra-precise experimental techniques allowed him to establish several of the fundamental constants that characterize our universe and all its wonderful phenomena.

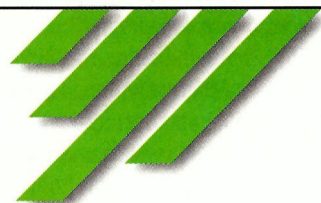
Never satisfied until he fully understood the phenomenon he was studying, Hughes educated a generation of students who have become leaders in the international scientific community. He will be much missed by all his friends and collaborators worldwide, and especially by his colleagues at Yale.

Robert K Adair and Michael E Zeller,
Yale University.



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OBITUARIES

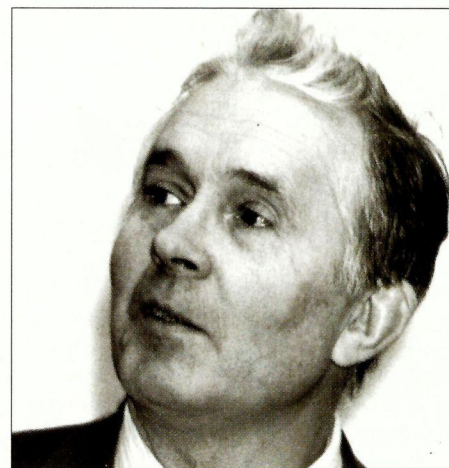
Grigory Silvestrov 1934–2003

Grigory Silvestrov, one of the outstanding disciples of Gersh Budker, passed away on 22 April.

In 1958, after graduating from Moscow University, Grigory joined the team working on the realization of Budker's original ideas. During his first years at the Institute of Nuclear Physics he constructed transport channels from synchrotrons to electron-electron colliders (VEP-1) and to electron-positron colliders (VEPP-2 and later VEPP-4). Pulsed power supply, for which he was always an enthusiast, was employed for the magnets and lenses in these channels and allowed a smaller size and lower energy consumption. Quadrupole lenses and septum magnets, which he constructed using skin formation of the field profile, were widely used. Grigory's development of parabolic and cylindrical lithium lenses, and their use to obtain positron beams at VEPP-2 and VEPP-2M colliders, is well known. The next generation of

these lenses, designed to obtain antiproton beams, served as a prototype for devices later used at CERN and FNAL, a fact recognized in the *Encyclopaedia Britannica* in 1983.

The parabolic and cylindrical lenses Grigory created were very original devices, typical of his style. Supplied by mega-ampere sources, they could operate in environments of high radiation, heat and mechanical load. A natural way to obtain intensive secondary beams is to construct liquid metal lenses for converters and here, as in many other devices, Grigory showed his inventiveness and talent. Another branch of his activities was the development of pulsed high field magnetic elements in which fields up to 10 tesla can be created by iron poles and current buses. During the last years of his life, Grigory became interested in creating a powerful neutron source for boron-neutron capture therapy. He suggested an original system



consisting of a 2.5 MeV tandem proton accelerator with vacuum insulation and a liquid lithium lens. Grigory gathered a team of enthusiasts and, supported by international grants, started active work on the project.

We will remember Grigory as a talented physicist, an optimist and a kind man.
A Skrinkin and G Tumaikin, Budker Institute.

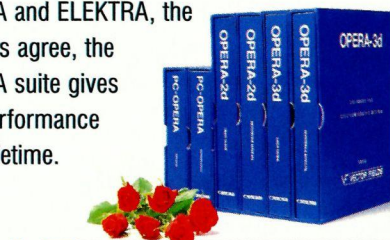
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Email: info@vectorfields.co.uk
Web: <http://www.vectorfields.co.uk>

Vector Fields Inc
1700 North Farnsworth Avenue, Aurora, IL 60505, USA
Tel: (630) 851 1734 Fax: (630) 851 2106
Email: info@vectorfields.com
Web: <http://www.vectorfields.com>