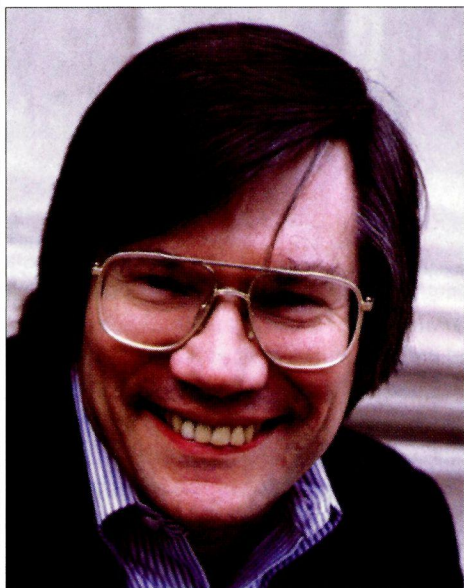
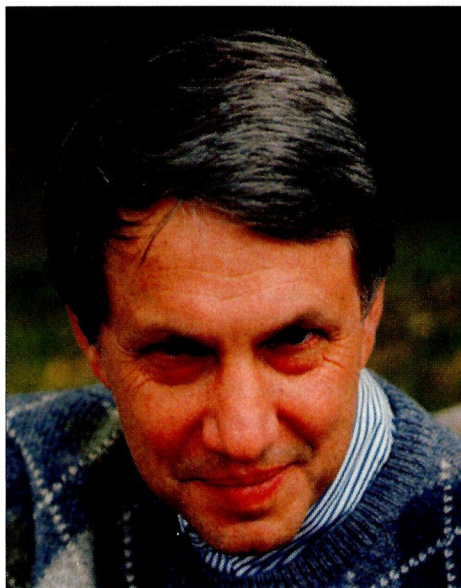


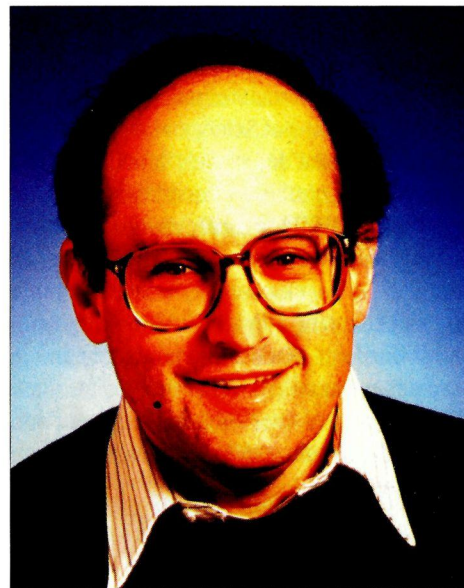
Dirac prize is awarded to inflation pioneers



Alan Guth of MIT. (Donna Coveney, MIT.)



Andrei Linde of Stanford.



Paul Steinhardt of Princeton.

The Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, has awarded this year's Dirac Medal and Prize to **Alan Guth** of MIT, **Andrei Linde** of Stanford and **Paul Steinhardt** of Princeton for the development of cosmological inflation. While the possibility of an exponential expansion of the early universe had been noted before, it was Guth who first realized that inflation would solve some of the major problems

confronting Big Bang cosmology. Difficulties with the original inflationary model were recognized from the start, and were overcome with the introduction of "new" inflation by Linde, Steinhardt and Andreas Albrecht, a student of Steinhardt's. Linde went on to propose other promising versions of inflationary theory, such as chaotic inflation. Guth and Steinhardt, among others, showed that inflation leads to a spectrum of density

perturbations that can seed galaxy formation and explain the fluctuations in the cosmic microwave background.

Although not yet firmly established, the idea of inflation has had notable observational successes, and has become the paradigm for fundamental studies in cosmology. Its greatest success has been in accounting for the existence of inhomogeneities in the universe and predicting their spectrum.



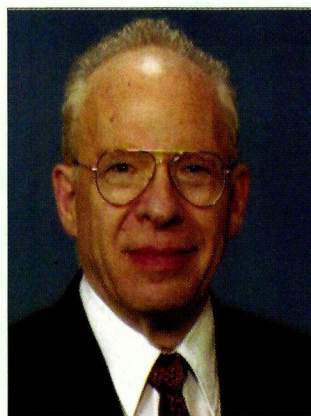
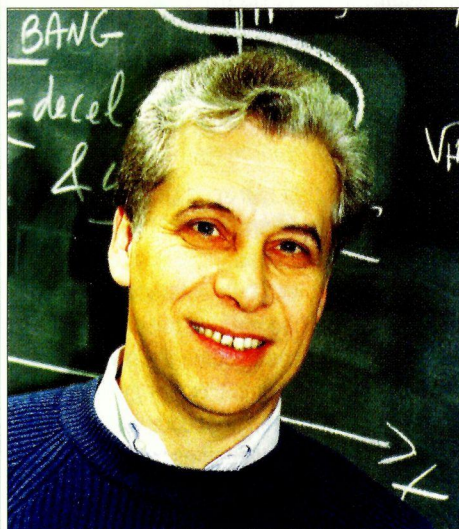
Gunnar Ingelman (left) and **Torbjörn Sjöstrand** attended a symposium at Lund University, Sweden, in June to celebrate the 25th anniversary of the Lund model and to honour one of its pioneers, Bo Andersson, who died earlier this year (*CERN Courier* May p40). Both Ingelman and Sjöstrand were students of Andersson and his long-time collaborator Gösta Gustafson. The Lund model that they developed together has proved an indispensable tool for high-energy physics, and has given rise to a range of Monte Carlo event generators whose names – Ariadne, Jetset and Pythia, for example – are common currency to physicists. The original 1983 paper of Andersson, Gustafson, Ingelman and Sjöstrand has been cited some 1400 times.



Takashi Kohiriki (right) presented elements of the ATLAS superconducting tracker to CERN research director **Roger Cashmore** (centre) and ATLAS collaboration spokesman **Peter Jenni** during a visit to the Japanese KEK laboratory in June.

Veneziano joins French Academy

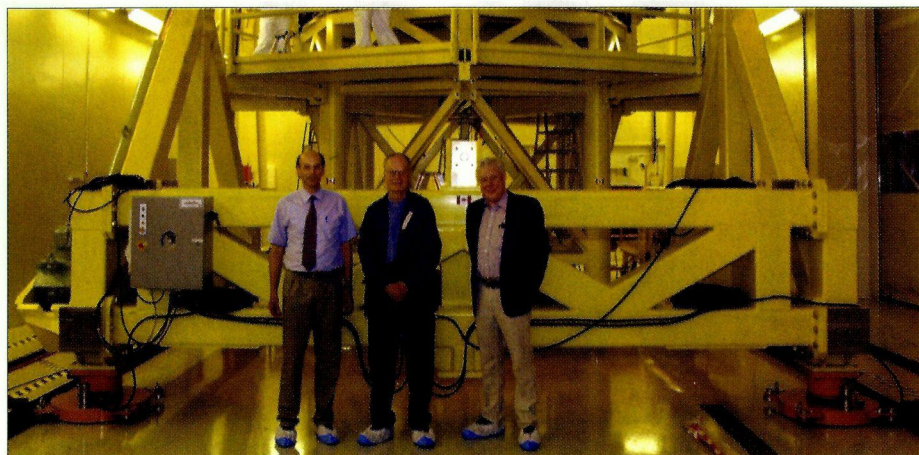
CERN's Gabriele Veneziano (below) was among 24 new foreign associates received into France's Academy of Science at a ceremony under the Institut de France's famous Coupole in June. Head of CERN's theoretical physics division from 1994 to 1997, Veneziano is already a member of the Italian Accademia dei Lincei. He is best known for starting the string theory ball rolling with his 1968 description of the strong force in which fundamental particles behave as strings rather than points. In the physics section of the Academy, Veneziano shared the honour with MIT's Daniel Kleppner.



US physicist **Richard L. Garwin** (left) has been awarded the French Academy of Science's Grand Medal for 2002. A student of Enrico Fermi in Chicago, Garwin has led a distinguished career touching many aspects of science and its impact on society. In 1960, he led the landmark muon magnetism (g-2) experiment at CERN, one of the young laboratory's first major achievements. He also studied liquid and solid helium using nuclear magnetic resonance, and was granted a key patent in the application of this technique to medical use.

His contributions to areas as diverse as high-speed laser printing, superconducting computing, satellites and arms control have been described by Nobel prize-winner Georges Charpak as "examples of the work of a highly talented scientist who also applies his talents to the resolution of society's problems with a remarkable independence of spirit". Garwin is a member of the US Academy of Science, the Academy of Engineering and the National Institute of Medicine. He is the recipient of numerous prizes both for his scientific work and his contributions to peace.

At the same session, the academy awarded its Jaffé prize to **Ioanis Giomataris** (right), a physicist working at the French Atomic Energy Commission's Saclay research centre. This prize recognizes Giomataris's work on detectors, in particular the micromegas device which he invented with Charpak. A novel gas-filled tracking device, micromegas is competitive with silicon and has been used in a number of experiments including COMPASS at CERN. The award ceremony will take place under the Coupole of the Institut de France in Paris in November.



Thomas Brzustowski (centre), president of the Natural Sciences and Engineering Research Council of Canada, visited CERN in August to see at first hand the fruits of Canadian efforts towards the Large Hadron Collider project. During the visit, ATLAS collaboration spokesman **Peter Jenni** (left) and ATLAS Canada spokesman **Robert Orr** showed Professor Brzustowski around the assembly stand for the experiment's hadronic end-cap calorimeter.



Professor Che-Ho Wei, chairman of the National Science Council in Taipei, Taiwan, signs the guest book during a visit to CERN in August. Taiwanese physicists are involved in the ATLAS and CMS experiments.

AWARDS

2002 Pomeranchuk winners announced

The Pomeranchuk Prize for 2002 is awarded to **Ludvig Dmitrievich Faddeev** of the Steklov Mathematical Institute in St Petersburg, Russia, and to **Bruce DeWitt** of the University of Texas, Austin, US, for the discovery and development of quantization methods in gauge theories, which laid the foundation for understanding the quantum dynamics of gauge fields.

Professor Faddeev is director of the Euler International Mathematical Institute. He is a full member of the Russian Academy of Sciences (RAS) and the head of the Division of Mathematical Sciences of the RAS. Among his most famous theoretical research achievements is the development (in collaboration with Victor N Popov and independently DeWitt) of the method for quantization of non-Abelian gauge theories. Faddeev also found the complete solution of the quantum three-body problem and since that time "Faddeev's

equations" have become nuclear physics folklore. Together with Vladimir E Zakharov he developed an extremely useful Hamiltonian approach to the theory of solitons and put forward the soliton quantization. With Evgeni K Sklyanin and Leon A Takhtajan, Faddeev developed the quantum inverse scattering method, which constitutes one of the approaches to modern quantum group theory. He is the author of several books and monographs, and was awarded the Heineman Prize for mathematical physics by the American Physical Society in 1974, and the ICTP Dirac medal in 1991.

Professor Emeritus Bruce S DeWitt's outstanding achievement is the extension of the methods of quantum theory to non-Abelian gauge fields including quantum gravity. He created an approach to quantum field theory, which consistently combined this theory with geometry and thus became a basis of the

modern development. He is also credited with a covariant renormalization theory, which in a more general setting is known as the Schwinger-DeWitt technique. The so-called Wheeler-DeWitt equation constitutes the basis of quantum cosmology. DeWitt is a pioneer of numerical methods in general relativity. His work on the radiation of gravitationally accelerated charge had a prominent impact on the many-worlds interpretation of quantum mechanics. He is the author of several books and important review articles. His latest monograph *The Global Approach to Quantum Field Theory* sums up a whole epoch in this area of theoretical physics. DeWitt received the ICTP Dirac medal in 1987.

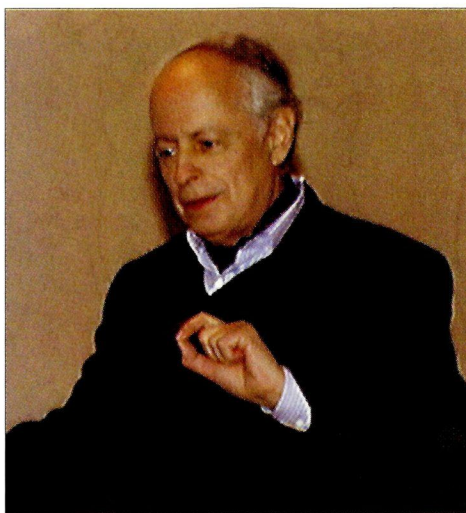
Nominations for the Pomeranchuk Prize 2003 should be sent to pomeron@heron.itep.ru no later than 1 February 2003. Further information is available at <http://face.itep.ru/pomeranchuk.html>.

EPS rewards communicators of physics

The European Physical Society (EPS) has awarded its annual prize for the public understanding of physics to **Rafel Carreras**. With his unique gift for communicating science, Carreras enthralled public audiences at CERN for decades until his retirement in 1998. His lectures – presented under the banners of "Science for All" and "The Sciences of Today" – touched on all aspects of science, and were delivered with clarity, understanding and an infectious enthusiasm.

Carreras is also the author of the popular CERN publication, *When Energy Becomes Matter*. He combines his gift for communication with a genuine and unassuming modesty. In accepting the prize, he traced his enthusiasm for science popularization back to his childhood. "As a schoolboy, I often found it difficult to understand what my classmates understood easily," he explained, "so when I understood something I was so happy that I wanted to share my recently acquired knowledge with everybody I met!"

At the same time, the society's high-energy physics board awarded its annual outreach



Rafel Carreras – a unique gift for communicating science.

prize to **Michael Kobel** of Bonn University, Germany, for his efforts in bringing high-energy physics into the classroom. Kobel has worked directly with educators in Germany to introduce high-energy physics into the school curriculum, both through the creation of new



Michael Kobel – bringing physics into the classroom.

materials and the imaginative use of concepts developed in other European countries. He is a member of the ECFA European particle physics outreach group, and coordinator for German involvement in the "Physics on Stage" teachers' programme.

ATLAS

French town hosts ATLAS overview meeting



Left: ATLAS spokesperson Peter Jenni (left) receives the medal of Clermont-Ferrand from the town's mayor Serge Godard. Robert Pickering, vice-president of Blaise Pascal University, is in the background. Right: Clermont-Ferrand's Polydome conference centre was host to the ATLAS collaboration for the Journées ATLAS 2002. (Daniel Massacrier.)

The ATLAS collaboration, which is building a detector for CERN's Large Hadron Collider, held an overview week away from CERN in June. Following similar gatherings at Dubna in Russia two years ago and at Brookhaven in

the US last year, the French town of Clermont-Ferrand welcomed collaboration members to the Journées ATLAS 2002. During the welcome ceremony at the Clermont-Ferrand town hall, Mayor Serge Godard awarded medals of

the city to members of the ATLAS management, while the Blaise Pascal University presented ATLAS members with a text written by Blaise Pascal, who was born at Clermont in 1623, printed on hand-crafted paper.

CERN recognizes LHC suppliers with Golden Hadron awards

CERN's partnership with industry took centre stage on 12 August when the project leader for the laboratory's Large Hadron Collider (LHC), Lyn Evans, presented awards to some of the project's major suppliers. Golden Hadron awards have been established to recognize outstanding performance of LHC suppliers. The first three went to Russia's Budker Institute of Nuclear Research (BINP), Belgian steel firm Cockerill-Sambre, and US company Wah-Chang.

The BINP received the award in recognition of high standards of fabrication of the 360 dipole and 185 quadrupole magnets that will equip the two transfer lines carrying proton beams into the LHC. BINP director Alexander Skrinksky was unable to attend the ceremony and will collect the award in September.

Cockerill-Sambre has been supplying CERN with steel since the early 1970s, and in presenting the award, Evans drew attention to the company's long-term dedication to achieving the best results. Accepting the award, company representative Santo Comel said: "CERN



LHC project leader Lyn Evans (centre) with recipients of the first Golden Hadron Awards, Santo Comel of Cockerill-Sambre (left) and Lynn Davis of Wah-Chang.

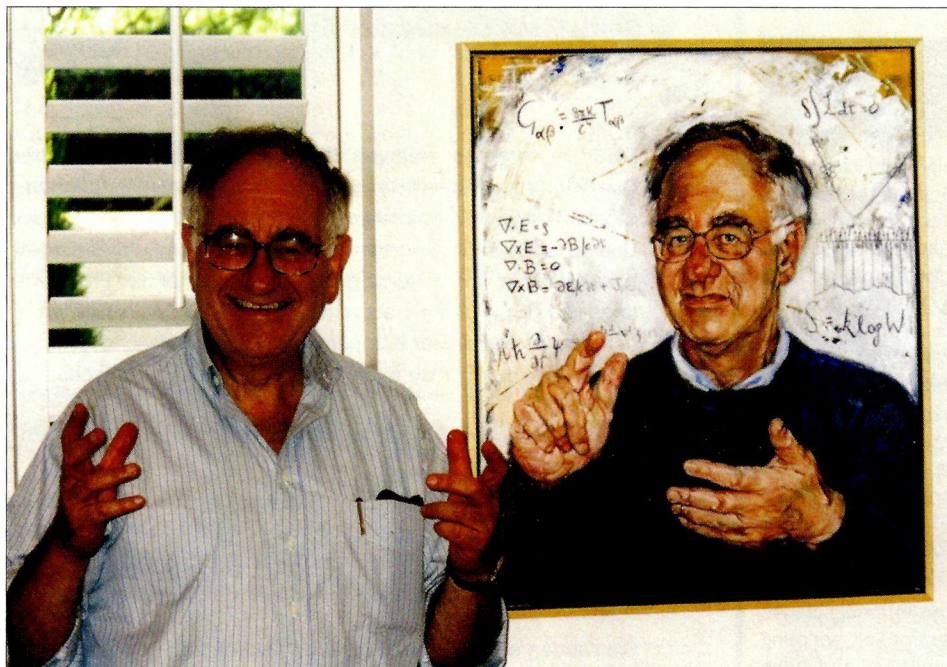
is not just a client, but above all a partner," going on to explain how innovations developed with CERN over the years have helped the business as a whole.

The final recipient of the first round of

awards, US firm Wah-Chang, was recognized for similar dedication to excellence in the production of high-quality niobium-titanium for superconducting cable. The company's president, Lynn Davis, received the award.

OBITUARY

Geoffrey Opat 1935 – 2002



Geoffrey Opat with a portrait commissioned to mark his retirement at the end of 2000.

Geoffrey Opat, one of Australia's most noted and versatile physicists, died suddenly on 7 March. Born in Melbourne on 16 November 1935, he was educated at the University of Melbourne, where he obtained his PhD in theoretical photonuclear physics in 1961. He won a Fulbright Fellowship and spent the next three years working at the University of Pennsylvania, with the late Henry Primakoff. Their work on radiative muon capture has stood the test of time and in recent years was the subject of experimental verification at TRIUMF. He returned to Melbourne in 1964, where he was the founder of Australia's first Experimental High-Energy Physics group, which worked initially with the Brookhaven 30 inch bubble chamber (filled with deuterium), studying antiproton-neutron interactions.

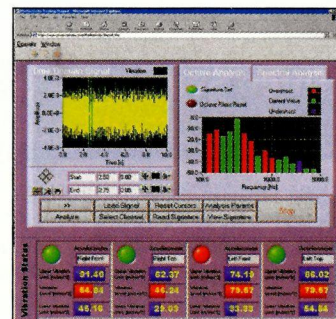
That experiment alone yielded 20 publications, including some measurements that are still the best available. Some notable results were on topological cross-sections, later to be verified (and improved upon) at the LEAR ring at CERN, on G-parity and on beam-target reversal symmetry, a concept that he first postulated. Later the group carried out experiments at the US Argonne National Laboratory and at the UK's Rutherford Laboratory.

Opat was appointed to the Chair of

Experimental Physics in 1973. After that, much of his research was concerned with wave-optical experiments using beams of low-energy neutrons, and more recently, neutral atoms and molecules. He also studied the effects of gravity and inertia on the electromagnetic properties of metals. He enjoyed sabbatical years at the Rutherford Laboratory, the University of British Columbia in Vancouver, Canada, and the University of Washington in the US. He was best known internationally for his work on neutron optics, in particular experimental verifications of the Aharonov-Casher and Scalar Aharonov-Bohm effects, carried out with colleagues from the University of Melbourne, and collaborators at the University of Missouri. This led to the joint award in 1990 with his lifelong friend and collaborator, Tony Klein, of the prestigious Walter Boas Medal of the Australian Institute of Physics, and to his election as a fellow of the Australian Academy of Science.

Opat had an enormous influence on the teaching of physics at all levels, in Melbourne, in Australia, and in several neighbouring countries that sought out his advice. As a profound scholar, great teacher and wonderful friend, he is sorely missed by colleagues, former students and friends on all continents.

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