AWARDS

CMS honours international industry with both crystal and gold awards

The seventh annual CMS Awards ceremony was held on 13 March to recognize industries that have made substantial contributions to the construction of the collaboration's detector.

General Tecnica of Italy received the prestigious crystal award for developing and producing the resistive plate chambers (RPCs) for the barrel muon detector and prototyping for the endcap RPC detector. The company began working with CERN on the project in the early 1980s, making major improvements to certain assembly procedures. General Tecnica has already built 300 of the 480 RPCs needed for the experiment.

Other companies making excellent contributions to the CMS project were recognized with gold awards. AICON 3D Systems GmbH received their award for developing and constructing components for the optical camera-based 3D systems that are used to measure large parts of CMS.

Firms from three countries were rewarded for work connected with the CMS superconducting solenoid magnet. KONCAR Electrical Industries of Croatia won gold for manufacturing the magnet's 20 kA power lines and installing them in the pillar wall between the service and experiment caverns. The French company SDMS was honoured for designing and constructing the proximity cryogenics system for the coil, while ZEC Services of Poland was rewarded for producing and assembling cooling and gas circuits on the magnet yoke.

Representatives of the firms that received the CMS crystal and gold awards for 2006.

Three Swiss firms received gold for work related to electronics. ASCOM was honoured for producing and assembling electronic boards for the electromagnetic calorimeter barrel; Cicorel was rewarded for producing and laminating the tracker front-end hybrid circuits, and Hybrid SA received its award for component assembly and for testing the tracker front-end hybrids.

eXception EMS of the UK received gold for manufacturing drivers for the tracker front-end, and TM Engineers, also of the UK, was rewarded for manufacturing the electromagnetic calorimeter endcap support structures.

DESY director-general receives Cross of Merit

Albrecht Wagner, chair of the DESY board of directors, received the Cross of Merit, First Class, of the Order of Merit of the Federal Republic of Germany on 16 March. He was honoured for his contributions "to the present and future of one of the most important research centres in Europe, and to high-energy physics in general". According to the Order, Wagner's numerous contacts in many countries rendered outstanding services to Germany's international reputation. Frieder Meyer-Krahmer, state secretary of the German Federal Ministry of Education and Research, presented the award at a ceremony at DESY in Hamburg.

Wagner has been chair of the DESY board of directors since 1999. He is also the spokesman of the TeV-Energy Superconducting Linear Accelerator (TESLA) Technology Collaboration. This international collaboration has made decisive contributions to developing the superconducting TESLA technology, which has been chosen as the basis for both the planned European X-ray Free-Electron Laser and the International Linear Collider. As the declaration states, "thanks to his expertise, his untiring commitment, his acknowledged authority and his exemplary circumspection, [Wagner] was able to maintain and enhance the excellent international reputation of DESY".

Frieder Meyer-Krahmer (left) presents the Federal Republic of Germany's Order of Merit to Albrecht Wagner. (Courtesy DESY.)

COLLABORATION

HPLUS meets WASA: Chinese and German physicists join forces in studies of strong QCD

On 13–18 January, the Joint Sino-German symposium on Hadron Physics at COSY and CSR (HPC^2) took place in Lanzhou, located in central China on the banks of the Yellow River. The symposium was jointly organized by the Institute of Modern Physics (IMP) of the Chinese Academy of Sciences, and the Institute for Nuclear Physics (IKP) of the Research Centre Jülich, and financed by the Sino-German Center for Research Promotion in Beijing. Around 80 participants, mostly from China and Germany, attended the workshop.

The IKP has been operating the Cooler Synchrotron, COSY, for more than 10 years, providing proton and deuteron beams with momenta up to 3.7 GeV/c. A similar facility – with the CSRm and CSRe rings – has been built at the IMP and is now in the commissioning phase.

At COSY several detection systems – such as the ANKE dipole spectrometer and the non-magnetic COSY-TOF experiment – are used for experiments on hadron physics. A disadvantage of these detectors is that they

HPC^2 participants in front of the IMP building.

are "photon blind". This will change with the start of operation of the Wide Angle Shower Apparatus (WASA) in 2007 (*CERN Courier* April 2005, p8). WASA is a fixed-target 4π detector and is designed to detect neutral and charged particles.

On the Chinese side, a novel detector, HPLUS, is being prepared for hadron physics experiments. This device is designed to study baryon resonances, scalar mesons and/or isospin-violating effects. The R&D for the project has started at the IMP with participation from other Chinese universities.

Once operating, the WASA and HPLUS detectors will allow researchers to investigate basic questions of non-perturbative quantum chromodynamics (strong QCD), for example through a precise study of symmetry breaking and through specific investigations of hadron structure. Decays of η and η' that vanish in the limit of equal light-quark masses reveal the explicit isospin symmetry breaking in QCD. Precision measurements of rare η and η' decays can be used to obtain new limits on the breaking of charge, parity and time symmetries or their combinations. Last but not least, through precise measurements of decay chains and couplings to other hadrons, WASA and HPLUS can both contribute to testing the various models offered to explain exotic and crypto-exotic hadrons.

These and other hot topics of strong QCD were discussed in about 40 talks during the symposium, with the aim of coordinating the physics programmes of the two experiments and of sharing technological expertise. Further common projects, focused on measurements with WASA and the preparation of HPLUS, are now being launched.

VISITS

CERN welcomes King and Queen of Norway

King Harald V and Queen Sonja of Norway visited CERN on 4 April, taking a tour of part of the Large Hadron Collider (LHC) tunnel and the ATLAS cavern, and also greeting Norwegian students, scientists and industrialists at the laboratory.

The tour was part of the royal couple's state visit to Switzerland, which also included a stop in Bern. Robert Aymar, CERN's director-general, welcomed the royal party and provided an overview of CERN's history and research. Steinar Stapnes, the deputy spokesman of ATLAS, explained the concept and inner workings of the LHC and ATLAS, which is one of the main experiments at CERN to receive Norwegian contributions.

Norway was one of the founding 12 countries when the laboratory was established in 1954.

King Harald V of Norway watches while Queen Sonja signs CERN's visitor's book.

King Harald (left) and Queen Sonja with CERN's director-general, Robert Aymar, during their tour of the ATLAS cavern.

There are currently 17 Norwegian staff members, a user community from Norwegian universities of more than 100 and about 10 technical students at CERN. Norwegian contributions are focused on the ATLAS and ALICE experiments, particularly the silicon detector systems, calorimeter modules and trigger and read-out electronics.

PUBLISHING

New European journal brings science research to schools

EIROforum, the partnership between Europe's seven largest intergovernmental research organizations, has launched *Science in School*, a new European journal to help teachers to make their science lessons exciting and inspiring. The aim is to provide a platform for communication between science teachers, practising scientists and others involved in science education, so bridging the gap between the worlds of research and schools.

Science in School will address science teaching not only across Europe, but also across disciplines. It will highlight the best in teaching and cutting-edge research, drawing on the overlap between subjects and the potential for interdisciplinary work. Furthermore, the discussion forum on the website will enable readers to pose questions, offer solutions and discuss current topics – communicating directly across national and subject boundaries.

Science in School will appear quarterly online and in print and will feature news about the latest scientific discoveries, teaching materials, interviews with inspiring teachers and scientists, reviews of books, films and websites, suggestions for class trips, training opportunities and many other resources for science teachers. Contributors to the first issue include the world-renowned neurologist and author Oliver Sacks and scientists and teachers from nine countries.

● *Science in School* is supported by the European Commission's Science and Society programme in the framework of the Nucleus project (see www.xplora.org/ww/en/pub/xplora/nucleus_home.htm).

Science in School *will bring news of cutting-edge research into Europe's classrooms.*

Further reading

For the online edition of *Science in School* see www.scienceinschool.org/.

Max Planck Society provides funding for the open-access *New Journal of Physics*

In a move to open up access to scientific research, a new initiative will let German scientists publish their research for free in the *New Journal of Physics* (NJP), the online open-access journal jointly owned by the UK Institute of Physics and the Deutsche Physikalische Gesellschaft. The Max Planck Society will centrally pay the publication charge for NJP articles for all of its scientists who submit work to the journal before the end of 2008.

NJP was one of the first open-access, electronic-only journals, publishing original research articles across the whole of physics. Free to read, it is funded solely by article publication charges. The journal has grown by more than 900% since 2001 and more than 40 000 of its articles are now downloaded each month. Its official impact factor has risen from 2.480 in 2003 to a current value of 3.095.

MEETINGS

Duke University in Durham, North Carolina, will host the **Hadron Collider Physics Symposium 2006** from 22–26 May. This has been a major forum for presenting Tevatron Collider measurements and has recently merged with the LHC Symposium. This meeting will mark the transition to the LHC era. Tevatron results based upon about 1 fb^{-1} of data will be presented, along with recent measurements made at RHIC. The status and plans for all LHC experiments will also be presented, together with theoretical reviews relevant to the full range of hadron-collider research. For further details see http://hcp2006.phy.duke.edu/.

The **2006 CERN School of Computing**, organized by CERN and the Helsinki Institute of Physics, will be held on 21 August – 1 September in Helsinki. It is aimed at postgraduate students and research workers with a few years' experience in particle physics, computing or related fields. Special themes this year are GRID and software technologies and physics computing. Grants from the European Union Framework Programme 6 are available to participants to cover part or all of their costs. For further details see www.cern.ch/CSC/. To register, which should be before 15 May, click on "How to apply".

Diffraction 2006, the International Workshop on Diffraction in High-Energy Physics, will be held in Adamantas, Milos, Greece, on 5–10 September. This is the fourth biennial workshop on theoretical and experimental progress in diffractive hadronic collisions at high energies. Topics to be covered fall into three main categories: experimental results and prospects, phenomenological approaches to diffraction and progress in the theoretical description of diffraction. For further information see www.cs.infn.it/diff2006/.

Beauty 2006, the 11th International Conference on B-physics at Hadron Machines, will be held on 25–29 September at Keble College, Oxford. The conference will review results in B-physics and charge–parity violation and will explore the potential and experimental reach of current and future generations of B-physics experiments at hadron machines. For further details see www.physics.ox.ac.uk/Beauty2006/, or e-mail Neville Harnew at n.harnew1@physics.ox.ac.uk.

OBITUARIES

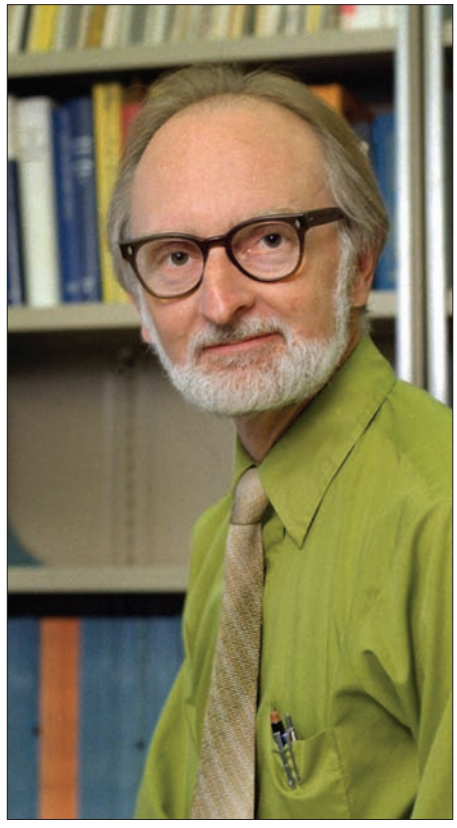
Owen Chamberlain 1920–2006

Owen Chamberlain, who shared the 1959 Nobel Prize for the discovery of the antiproton, passed away quietly in his home in Berkeley, on 28 February 2006, following a long struggle with Parkinson's disease. He was 85. Chamberlain, an emeritus professor of physics at the University of California, Berkeley, had an almost 60 year association with Lawrence Berkeley National Laboratory (LBNL).

Chamberlain, working with Emilio Segrè, Clyde Wiegand and Thomas Ypsilantis, discovered the antiproton in 1955 at the Rad Lab (now LBNL). The accelerated protons to an energy of 6 GeV, just enough to produce proton–antiproton pairs (*CERN Courier* November 2005 p27). Chamberlain and his collaborators used a magnetic spectrometer to select fixed-momentum particles from proton–copper collisions. Two scintillation counters were used to measure the time of flight over a 10 m flight path. The time-of-flight system was supplemented with two Cherenkov counters, also to measure velocity. The combined Cherenkov identification and time-of-flight velocity measurement provided the 40 000 to 1 rejection factor needed to separate single candidate antiprotons from background particles, mostly negative pions and kaons. An expanded collaboration later used a stack of emulsion to confirm the discovery.

Chamberlain was born in San Francisco on 10 July 1920, the son of W Edward Chamberlain, a prominent radiologist who had a strong interest in particle physics, and Genevieve Lucinda Owen. His family moved to Philadelphia in 1930. After obtaining a bachelor's degree from Dartmouth College in 1941, Chamberlain entered graduate school at UC Berkeley.

In early 1942, at the prompting of Ernest Lawrence, Chamberlain joined the Manhattan Project, the effort to build an atomic bomb. In



Owen Chamberlain, emeritus professor at UC Berkeley, who died in February aged 85.

Berkeley, and later in Los Alamos he investigated nuclear cross-sections for intermediate-energy neutrons and the spontaneous fission of heavy elements. After the war, he returned to graduate work at the University of Chicago to study under Enrico Fermi. Chamberlain's doctoral project was a study of the diffraction of slow neutrons in liquids. After receiving his PhD in 1948, he returned to UC Berkeley and began his research at the Rad Lab, initially studying proton scattering on various targets. This included some of the first experiments with polarized-proton beams.

Chamberlain's later research covered a variety of fields. After the antiproton discovery, he went on to study antiproton interactions in hydrogen, deuterium and other elements, and then observed antineutron production from antiproton interactions.

In the early 1960s, Chamberlain pioneered the application of polarized targets to high-energy physics. He spent much of the next 20 years using polarized targets to study spin physics and other topics. This included notable early experiments on the parity of the Σ baryon, and tests of time reversal. He did this work at a variety of accelerators, including the LBNL 184 inch cyclotron, the Bevalac, accelerators at SLAC and Fermilab and others.

Even later in life, he continued his hands-on work. In the late 1970s and early 1980s, he worked on the high-voltage field cage for the SLAC/PEP-9 Time Projection Chamber; this required considerable study of material properties. Despite ill health, after retirement, he maintained his interest in physics, often appearing at seminars and colloquia.

In his later years Chamberlain became an outspoken activist for nuclear-arms control and other issues of social concern. In the 1960s he supported the Free Speech Movement at UC Berkeley, and strongly advocated increased minority recruitment and enrolment there. He spoke out against the repression of scientists in the former Soviet Union, demonstrated against the Vietnam War and was a founder of the nuclear-freeze movement of the early 1980s.

"As a Nobelist, I'd been made prominent and well known," he once said in an interview. "My advice was sought in a number of areas and I felt a responsibility to speak up on important issues."

Spencer Klein and Lynn Yarris, Lawrence Berkeley National Laboratory.

Albert Romana 1948–2005

Albert Romana passed away on 14 December 2005, on the eve of his 58th birthday. He made his entire career at the Laboratoire Leprince-Ringuet at Ecole Polytechnique, where he was deputy-director from July 1990 to June 1998, then interim-director up to November of the same year.

Most of Albert Romana's scientific activity is closely linked to experiments done at CERN, where he used to spend long periods every year and where he met many colleagues and collaborators who also soon became friends. More recently, his physics interests led him to Brookhaven where he became involved in an experiment at the Relativistic Heavy Ion Collider at Brookhaven.

As a student, Albert started by participating in an experiment with a hyperon beam at the CERN Proton Synchrotron, looking for leptonic hyperon decays in a streamer chamber. He wrote his "thèse de 3ème cycle" on the subject. After his military service, he moved to an experiment on the Omega Spectrometer at the Super Proton Synchrotron (SPS) – the so-called beam-dump experiment – to study the hadroproduction of the newly discovered charmed particles, J/ψ and charmed mesons, with incident protons, antiprotons, pions and kaons; this was the subject of his "thèse d'Etat". He then made significant contributions in the new NA10 experiment, studying prompt muon-pair production with a high-intensity pion beam and testing, in particular, Drell–Yan scale invariance.

By the end of the 1980s, the acceleration

of ions in the SPS opened the field to quark–gluon-plasma observation. Albert contributed greatly to modifying and adapting the NA10 muon spectrometer for the new difficult environment of the high-intensity incident heavy-ion beams. He then played a key role in the NA38 experiment and later in NA50, the latter leading to widely publicized evidence for the quark–gluon plasma. Some years before, Albert had made a significant personal contribution to the first measurement of the asymmetry of the sea-quarks of the nucleon, analysing the data collected specifically for this purpose in the NA51 experiment, once again based on the NA10 muon spectrometer.

After being at the CMS experiment for some time, Albert soon came back to heavy ions and became deeply involved in the PHENIX experiment at Brookhaven, which was emerging as a proper continuation of NA50. For several years he led the PHENIX group of Ecole Polytechnique.

Albert played a fundamental role in all the experiments mentioned here, often volunteering for tasks of general interest for the collaboration, such as designing, tuning and providing basic tools and also managing and organizing the data to enable a coordinated and coherent data analysis. This led him to interact continuously with most of his colleagues, both with the data-taking and hardware experts on one side and with the teams analysing the data on the other. Because of his extensive skills as an experimentalist, of his personal modesty and his always optimistic and smiling approach to any problem, he was the ideal introducer and guide for newcomers, such as new groups or young students joining the experiment. For everybody, it was always a real pleasure to work and collaborate with him.

We will remember Albert as a kind and dedicated friend and colleague, always ready to listen, to discuss and to help with an open mind, at both the professional and personal level. We will miss him.

● Published in English at the request of the authors for the benefit of Albert Romana's colleagues world-wide.

Louis Kluberg, Roberto Salmeron and Henri Videau, Laboratoire Leprince-Ringuet, Ecole Polytechnique.

NEW PRODUCTS

ACT/Technico is offering its new PMC ShuttleStor, a two-part mezzanine comprising a shuttle and a receiving canister, which allow easy insertion and removal of the storage shuttle through the host front panel. For more details tel: +1 215 956 1200, e-mail: sales@acttechnico.com or see www.acttechnico.com.

Kaleido Technology ApS has upgraded its propriety diamond machining capabilities enabling it to produce on-axis, off-axis and free-form mirrors (up to 700 μm across) with a surface roughness of less than 3 nm rms and a slope accuracy of better than 70 μm. For further information contact Palle Geltzer Dinesen, tel: +45 44 34 7040, or e-mail: contact@kaleido-technology.com. A new datasheet describing machining of large and complex ultra-smooth mirrors is available at www.kaleido-technology.com.

LEDtronics has introduced its Series TSF780 panel-mount LED lamps and holders for applications that demand durable and energy-efficient light sources. They are also excellent solutions where space is at a premium. For further information contact Jordan Papanier, tel: +1 310 534 1505 ext. 120, or e-mail: jpapanier@ledtronics.com. For the product datasheet see www.ledtronics.com/ds/tsf780/.

Resolve Optics Ltd has released a new series of technical datasheets describing its range of high-performance lens adapters. Used typically to change the field of view or image format of the lens, they can produce high-resolution images with minimal distortion. For further information tel: +44 1494 777100, or e-mail sales@resolveoptics.com. Copies of the new datasheets can be downloaded from www.resolveoptics.com/adapters.htm.

LETTERS

From form factors to heavy leptons

Regarding the report of the Frascati three-day meeting on nucleon form factors (*CERN Courier* April 2006, p33), I would like to add a contribution related to the value of the experiments performed at CERN in the early 1960s when I was a student of Professor Zichichi at the University of Bologna. I was very enthusiastic when it was discovered in 1963 that the proton has indeed a time-like electromagnetic structure; the cross-section measured was in fact found by Zichichi and collaborators to be 500 times below the predicted point-like value. This discovery by Zichichi and his group opened the field of time-like electromagnetic form factors.

At the time when this series of experiments was performed at CERN using the Proton–AntiProton into LEpton Pairs (PAPLEP) set-up, there were no e^+e^- colliders. Nevertheless it was at CERN that the first dedicated search for the third lepton, called the heavy lepton, was started, looking for eμ acoplanar pairs. Also the study of vector-meson mixing and of pseudoscalar-meson mixing based on the strong production of these mesons and their electromagnetic decay-rates was carried out at CERN.

In the following years, the Bologna-CERN-Frascati (BCF) group moved to Frascati and played an important role at the ADONE e^+e^- collider. This group established the first limit on the mass of the heavy lepton by searching for acoplanar (eμ) final states, the same channel that brought the SLAC group later on to the actual discovery of the third lepton with a very high background due to the low rejection power of the SLAC experimental apparatus. The experimental apparatus used in Frascati was especially designed to keep the background level extremely low. With such a powerful instrument the BCF group was also able to prove that the π and K pseudoscalar mesons have time-like structures.

In his historical introduction at the N'05 Workshop on Nuclear Form Factors, Zichichi did not want to emphasize his own achievements and generously underlined the role played by Frascati in pursuing this extremely interesting field of research. However, as reported in a celebrated review paper by Professor Claudio Villi, INFN president of the time, it is thanks to Zichichi's work at CERN in the 1960s that neither the ideas nor the technologies were then missing in Frascati for the discovery of the J/ψ and of the third lepton. The only missing parameter was the energy.

More information and all references can be found in two volumes: one edited by N Cabibbo [*Lepton Physics at CERN and Frascati, 20th Century Physics Series, Vol. 8*, World Scientific (1994)] and the other by C S Wu [*The Origin of the Third Family, in honour of A. Zichichi on the XXX Anniversary of the Proposal to Search for the Third Lepton at ADONE*, Rome (1997) and World Scientific (1998)].

Professor Enzo Boschi, president of the Italian National Institute of Geophysics and Vulcanology and former student of Professor Zichichi during the 1960s.