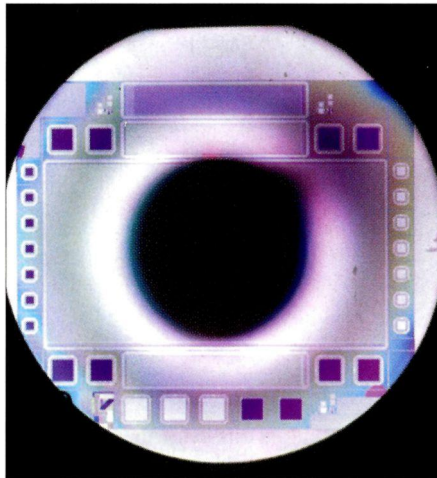


Detectors win 1999 Merit award

The prestigious 1999 Merit award of the Nuclear and Plasma Sciences Society of the Institute of Electrical and Electronics Engineers was presented to Erik Heijne, from CERN, on 26 October. The award was given during the Institute of Electrical and Electronics Engineers Nuclear Science Symposium in Seattle "for vision and leadership in applying silicon technologies to the development of new and important detector systems for high-energy physics".

Heijne has been working at CERN since 1973. Initially he worked on silicon detectors for the neutrino beam monitoring system. In 1980 he introduced the silicon microstrip detector. While the idea of a linearly segmented silicon diode originated in the Philips Research Laboratories in Amsterdam in around 1963 ("checker board" detector), the advances in silicon technology allowed a fresh approach to particle physics. In particular, the use of a miniaturized electronic read-out made it possible to employ systems with thousands of strips.



Meritorious detector – silicon microstrip detector for the ALICE experiment for CERN's LHC collider.

These first microstrip detectors still used surface barrier technology, but soon ion implantation technology became available, thanks to the work of Joseph Kemmer in

Munich and owing to its subsequent commercialization by Enertec in Strasbourg, Micron in Southampton and Hamamatsu in Japan. In around 1990, further advances in CMOS chip technology and interconnection techniques allowed the construction of the first silicon micropattern pixel detector for particle tracking.

In the LAA project, Heijne and his group of engineers tested the detector in beams. The first publications appeared at the Institute of Electrical and Electronics Engineers Nuclear Science Symposium in 1989 and 1991. This meeting is widely regarded as the most important annual radiation instrumentation conference. It will be held for the first time in Europe next year, on 15–20 October, in Lyon. The conference chairman is Patrick Le Du from Saclay, who has the help of an extended committee from various radiation instrument communities. Most European countries as well as the US and the Far East will be represented. Further information is available at "<http://NSS2000.mi.infn.it/>".

Pictured at the opening of the France at CERN trade expo in October are (left to right) the French Minister for National Education **Claude Allègre**, CERN director-general **Luciano Maiani** and the Minister for European Affairs, **Pierre Moscovici**.

France is one of CERN's two host nations – the majority of the 27 km LEP tunnel runs underneath French territory. France is also a major player economically, contributing more than 16% of CERN's budget and making special additional contributions. France at CERN is a regular major event. This year, 44 companies exhibited products and technologies that are related to particle physics. They include cryogenics and vacuum technology, superconductivity, electrical and electronic equipment, and mechanics. The exhibition was organized by the French Committee for Trade Events Abroad.





Bruno Escoubès 1938–1999.

Bruno Escoubès 1938–1999

French physicist Bruno Escoubès died recently while he was preparing for his well earned retirement in Madrid.

After studying at Orsay, he began his research career with a fellowship at CERN. He worked under Yves Goldschmidt-Clermont and Douglas Morrison on high-energy antiproton interactions using the 80 cm bubble chamber. During this period he met and married Spanish physicist Salomé de Unamuno, who would be his partner for life.

After leaving CERN they moved to Madrid. At that time Spain was a CERN member state and the Junta de Energia Nuclear (now CIEMAT) took great interest in fostering high-energy physics. Escoubès and his wife played an important role in creating an experimental group in Spain and in training younger scientists, including Alvaro de Rújula and Juan Antonio Rubio.

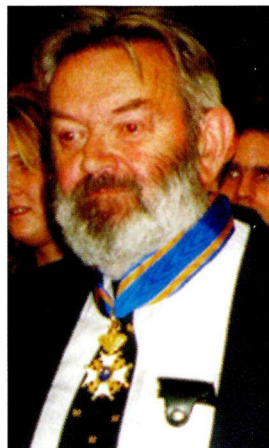
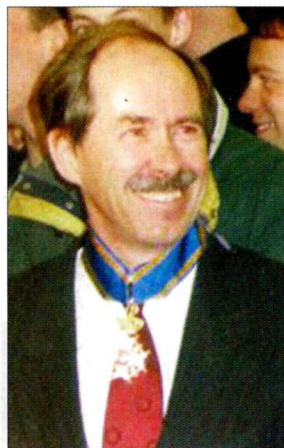
When Spain left CERN in 1968, Escoubès

moved to Strasbourg, where he remained until his death (except for a period in the Theoretical Physics Department at the Universidad Autónoma de Madrid). In Strasbourg he worked on kaon and pion interactions, neutrino interactions in Gargamelle and charm production at the ISR. In the last 10 years he turned to cosmic-ray heavy ions and the initial stages of the Pierre Auger Observatory.

Throughout his life he was interested in all problems of science, the communication of scientific discoveries and the role of modern scientists in society. When his battle with ill health restricted his travelling in recent years, he turned to the challenge of scientific communication. In 1984 Escoubès was appointed coordinator of the Boutique de Sciences de Strasbourg, and he recently published several papers on the ethical aspects of science. His friends will remember him as a fighter for all scientific causes.



Alison Wright receives the 1999 Institute of Physics Public Awareness of Science Award. Institute of Physics president, **Sir Gareth Roberts** presented the award at the annual festival of the British Association for the Advancement of Science, held this year in Sheffield. Wright, a CERN fellow on the LHCb experiment, received the award "for her outstanding contributions to the public awareness of physics activities at CERN, using a wide range of methods and facilities, making high-energy physics accessible to many audiences". Alison Wright compiles the Physicswatch page for *CERN Courier*.



Following the announcement of their 1999 Nobel Prize for Physics, **Gerard 't Hooft** (left) and **Martin Veltman** were awarded the prestigious Dutch national order of Commandeur in de orde van de Nederlandse Leeuw. (Ada Molkenboer, Utrecht.)



Former Israeli Prime Minister and now consultant for Israeli telecommunications specialists BATM, **Benjamin Netanyahu** (centre), visited CERN during the international Telecom 99 expo in Geneva. He is seen here with (left) CERN director for Technology Transfer and Scientific Computing **Hans Hoffmann** and **Giora Mikenberg** of the Weizmann Institute.



Hungarian Ambassador **Peter Naray** (left) calls on CERN director-general **Luciano Maiani**.



The Indian Atomic Energy Commission chairman, **R Chidambaram** (centre), was at CERN with the Indian Ambassador to the UN, **Savitri Kunadi**, and (left) **Y Viyogi**, leader of the Calcutta team in the ALICE experiment for CERN's LHC. Viyogi recently presented the experiment's Technical Design Report for a photon multiplicity detector. India has a tradition of contributing to heavy-ion experiments at CERN.

NEW PRODUCTS

Electromagnetic field analysis software

Integrated Engineering Software has released the latest versions of its two-dimensional and three-dimensional electromagnetic CAE tools with many enhancements. The company's suite of electromagnetic software includes MAGNETO & AMPERES 5.1 for 2-D/3-D magnetostatic design, ELECTRO & COULOMB 5.1 for 2-D/3-D electrostatic design, OERSTED & FARADAY 5.1 for 2-D/3-D time-harmonic eddy current design, SINGULA 5.1 for 3-D HF antenna design and LORENTZ 5.1 for 2-D/3-D charged particle design.

The new versions offer significant improvements. Special features include smart, dynamic memory allocation, enhanced parametric analysis capabilities, new post-processing graphing utilities, and new integrations to boost the accuracy and speed of the software.

For more information contact Integrated Engineering Software, 300 Cree Crescent, Winnipeg, Canada R3J 3W9. Tel. 204 632 5636, fax 204 633 7780, e-mail "info@integrated.ca" or visit our Website at "www.integrated.ca".



At a meeting in Budapest, CERN director-general **Luciano Maiani** (left) visited the Hungarian National Committee for Technological Development (OMFB), a government agency that aims to promote technological modernization and improve international competitiveness. CERN is seen as a special responsibility. With the director-general are (left to right) OMFB President **Adam Torok**, vice-president **Sandor Bottka**, OMFB advisor and CERN Council member **Barbara Vizkelety**, physicist **Gyorgi Vesztergombi** and OMFB deputy director-general **Pal Koncz**.

MEETINGS

A Workshop on Confidence Limits will be held at CERN on 17-18 January 2000.

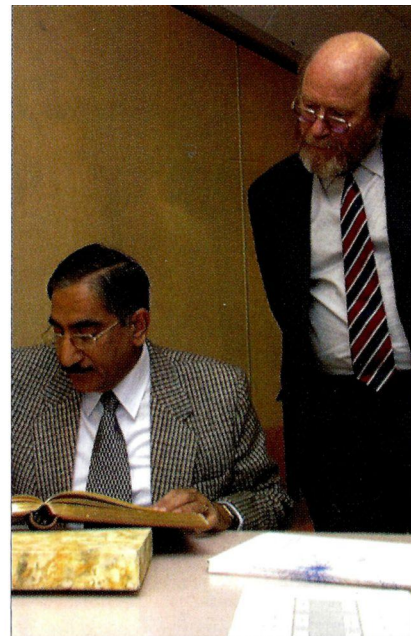
The workshop will cover topics on how to set confidence limits in difficult cases (small signals, physical boundaries, large backgrounds). Co-convenors will be Louis Lyons (Oxford) and Fred James (CERN). More information is available on the internet

at "<http://www.cern.ch/CERN/Divisions/EP/Events/CLW/>".

The Fourth Workshop on Continuous Advances in QCD has been organized by the Theoretical Physics Institute at the University of Minnesota and will take place on 12-14 May 2000, in Minneapolis. E-mail "QCD@tpi.umn.edu". For more information see "<http://www.tpi.umn.edu/QCD00.html>".



Città della Scienza – the first Italian science centre – is growing up in the former industrial area of Bagnoli (Naples), in a relic of 19th-century industrial archaeology. In its new role it is designed to appeal to young people. The restoration will be complete in a few years. The most interesting part, from an architectural point of view, will host the museum section of Città della Scienza and will be open to the public from the beginning of 2001. CERN's $E=mc^2$ exhibition recently visited Naples. Under the CERN logo is the founder and president of Città della Scienza, **Vittorio Silvestrini**, from the University of Naples "Federico II".



Technical member of the Pakistan Atomic Energy Commission, **Samar Mubarakmand**, signs the CERN VIP visitors' book watched by the CERN director for Collider Programmes, **Roger Cashmore**.

LETTERS

CERN Courier welcomes feedback but reserves the right to edit letters. Please e-mail "cern.courier@cern.ch".

Quantum modelling of the mind

In the article on quantum modelling in the October issue (p10), Tegmark's assertions that there is nothing fundamentally quantum mechanical about the cognitive process in the brain are flawed. He fails to take account of the symmetry of time reversal invariance, in which noise produces an increase in coherence rather than the expected decrease.

Such symmetry is fundamental to quantum-controlled image extraction techniques, used in functional magnetic resonance imaging for medical diagnosis. This gives holographic diffraction patterns – quantum holograms – before conversion into slice images on a screen. The ability to focus on the individual selected slice is known in wave optics as super-resolution.

In super-resolution imaging, as in stochastic resonance, passing the object's image

through increasing inhomogeneity increases the quality of the image. In quantum holography it removes classical degeneracy, leading to sharp frequency-adaptive coupling conditions. This produces sharp spectral windows between which there is no crosstalk.

Quantum-secure communications are possible over many kilometres, including transmissions through an atmosphere full of ions and atoms. As the experiments of Rauch show, a loss of quantum coherence is not irreversible (as in time-reversal symmetry).

As for Tegmark's comment that for the neural net community "it's business as usual", the AND Corporation of Toronto already has a working holographic neural technology based on a quantum model which I would assess as substantially outperforming any conventional neural net technology. I would say to the neural net community "watch out!"

Peter Marcer, chairman of the British Computer Society Cybernetic Machine Specialist Group.

Max Tegmark replies:

Dr Marcer lists a series of examples as evidence that decoherence is somehow

irrelevant. However, state-of-the-art experiments that demonstrate macroquantum effects owe their spectacular success precisely to the fact that the experimentalists have succeeded in keeping the relevant decoherence rates low. This has been achieved through screening, cooling, etc. Decoherence is a completely uncontroversial quantum effect – indeed, much of the current work in quantum computing is on computing decoherence rates and devising ways of reducing them. In short, the question is not if decoherence is relevant in general, but what the rate is. My calculations probably underestimate the true decoherence rate.

Information processing in the brain takes place in a warm, wet environment which spoils time-reversal invariance and makes decoherence, for all practical purposes, irreversible. It is analogous to the spread of gossip: the information that a neuron is firing spreads to one ion via scattering, then gets passed to a neighbour a femtosecond later though another scattering, and soon everybody knows and it's hopeless to undo.

Max Tegmark, Princeton.