

RECRUTEMENT

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To apply, please telephone our Personnel Office on (0044)1797 343112 or email yrkinchin1@magnox.co.uk. The final date for requesting application packs is 2.00pm Monday 22nd July. Closing date for receipt of completed application forms is 29th July 2002.

Visit us at www.bnfl.com

MICROELECTRONIC ENGINEER

The Centre de Physique des Particules de Marseille (CPPM) develops integrated circuits specifically to be used in particle physics, image processing, and particle trajectory is recruiting an:

ASICs Design Engineer

You will have several years' experience in full custom analogue design in various technologies, you will be in charge of projects developing specific ASICs for the whole of our applications: technical specifications, design, technical collaboration with the foundry, validation, test and qualification.

You will hold an outstanding degree or a PhD in engineering, and you will be able to lead a team of analogue microelectronic designers.

You will have several years' experience and proven team building qualities as well as a critical and inquisitive nature. Knowledge of written and spoken English is indispensable. Salary to be agreed.

Please apply in writing by sending your CV and covering letter and salary expectations to:
Françoise Amat - CPPM - 163 Avenue de Luminy - Case 907 - 13288 Marseille Cedex 9



UCLA

The UCLA Department of Physics and Astronomy

invites applications for an appointment at the
**assistant professor level in the physics of
particle beams and accelerators.**

The search for filling this tenure-track position is aimed toward finding a superior physicist with interests and demonstrated expertise in experimental and/or computational aspects of free-electron lasers. However, candidates in other areas of interest to the UCLA program in beam physics will be considered. These areas include particle beam and electromagnetic radiation instrumentation, novel x-ray sources, high intensity beam physics, beam-plasma interaction and advanced acceleration techniques. The successful candidate will be expected to conduct a vigorous research program, complementing the existing strengths in particle beam physics at UCLA.

Applications, addressed to

Professor Claudio Pellegrini, Chair,
UCLA Department of Physics and Astronomy,
405 Hilgard Ave., Los Angeles, CA 90095-1547,

will be accepted until September 1, 2002



Zukunft beginnt bei uns



Die RWTH ist mit ca. 30.000 Studierenden und ca. 10.000 Beschäftigten eine der größten Technischen Hochschulen Europas und die größte Arbeitgeberin und Ausbilderin in der Region. Lehre und Forschung sind international, innovativ, industrienah und fachübergreifend ausgerichtet.

C3-Universitätsprofessur

Hochenergiephysik

(Nachfolge Prof. Dr. Ch. Berger)

Fakultät für Mathematik, Informatik und
Naturwissenschaften

Zum 01.03.2004 wird eine Persönlichkeit gesucht, die dieses Fach in Forschung und Lehre vertritt. Besonders erwünscht sind Erfahrungen auf dem Gebiet der experimentellen Elementarteilchenphysik oder der Astroteilchenphysik. Die Stelle ist am I. Physikalischen Institut angesiedelt. In der Forschung liegen die Arbeitsschwerpunkte beim Aufbau des AMS-Experimentes für die internationale Raumstation ISS, beim Aufbau des CMS-Experimentes am CERN und bei der Planung für TESLA am DESY. Es ist erwünscht, diese Aktivitäten zu verstärken und zu ergänzen. Zu den Lehrverpflichtungen gehört neben der Ausbildung in der Physik auch die Beteiligung an der Ausbildung von Studierenden der Natur- und Ingenieurwissenschaften.

Voraussetzung ist ein abgeschlossenes Universitätsstudium, Promotion, Habilitation oder gleichwertige wissenschaftliche Leistungen sowie didaktische Fähigkeiten.

Ihre schriftliche Bewerbung richten Sie bitte bis zum 31.08.2002 an den Dekan der Fakultät für Mathematik, Informatik und Naturwissenschaften, Herrn Prof. Dr. A. Krieg, RWTH Aachen, Templergraben 55, D-52062 Aachen.

Die RWTH strebt eine Erhöhung des Frauenanteils an wissenschaftlichem Personal an. Auf § 8 Abs.6 Landesgleichstellungsgesetz NW (LGG) wird verwiesen.

Bewerbungen Schwerbehinderter sind erwünscht.

INSTRUMENTATION ENGINEER

You will have several years' experience in developing large scientific machinery and in experimental measurements. You will be in charge of designing, testing and analysing the results during the assembly of sub-assemblies of particle physics detectors.

You will hold a degree or a PhD in engineering; you will have solid knowledge of physics phenomena, CEM problems, low noise electronics and associated issues that will enable you to work in close collaboration with physicists and electronic engineers.

A Marseille based post, the role requires frequent field visits. A command of the English language is mandatory in order to communicate with an international team. Salary to be agreed.

Please apply in writing by sending your CV and covering letter and salary expectations to: **Françoise Amat - CPPM - 163 Avenue de Luminy - Case 907 - 13288 Marseille Cedex 9**



UNIVERSITY OF ALBERTA

FACULTY POSITIONS IN EXPERIMENTAL SUBATOMIC PHYSICS

The Department of Physics at the University of Alberta invites applications for two positions in experimental subatomic physics with a starting date of 1 July 2003. The second position is dependent on establishing funding. These positions will be at the assistant or associate professor level. Outstanding candidates could be hired at the associate professor level with tenure. We are interested in candidates who have leadership potential and an excellent record of research. These qualities plus ability and interest in teaching at the undergraduate and graduate levels will constitute the primary selection criteria.

Our current program of experimental research is focused in three areas: collider physics at CERN (OPAL and ATLAS), fixed target experiments (HERMES at DESY, TWIST at TRIUMF and ISAC at TRIUMF) and astroparticle physics (Alberta Large Area Time Correlation Array and STACEE in New Mexico). Potential candidates may find additional information about our research program at <http://csr.phys.ualberta.ca>

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. If suitable Canadian citizens or permanent residents cannot be found, other individuals will be considered.

The closing date for applications is 1 September 2002. Applicants should send a curriculum vitae, a research plan, and a description of teaching experience and interests. The applicants must arrange to have at least three confidential letters of reference sent to the address below, on or before September 1, 2002:

Experimental Subatomic Physics Search and Selection Committee

Dr. J. C. Samson, Chair

University of Alberta

412 Avadh Bhatia Physics Laboratory

Edmonton, Alberta T6G 2J1, Canada

Fax: (780) 492-0714

Email: dept@phys.ualberta.ca

The records arising from this competition will be managed in accordance with the provisions of the Alberta Freedom of Information and Protection of Privacy Act (FOIP).

The University of Alberta hires on the basis of merit. We are committed to the principle of equity in employment. We welcome diversity and encourage applications from all qualified women and men, including persons with disabilities, members of visible minorities, and Aboriginal persons.



Cyclotron Institute Texas A&M University

Accelerator or Ion-Source Physicist

The Cyclotron Institute of Texas A&M University is seeking a physicist with a background in accelerators and/or ion sources for either a permanent or visiting appointment. The prospective candidate would participate in development work relevant to the radioactive-beam upgrade of the laboratory facility. Of particular interest would be persons experienced with ion guides, ECR ion sources, and production of radioactive isotopes via high-energy ion beams. The Cyclotron Institute is a research facility for nuclear physics and nuclear chemistry based around a K500 superconducting cyclotron and two ECR ion sources capable of providing a variety of energetic heavy-ion beams for experiments. Consult the Cyclotron Institute web page at <http://cycnt.tamu.edu> for the white paper describing upgrade plans. Interested persons should contact

**Dr. Joseph Natowitz or Dr. Donald May, Texas A&M University,
Cyclotron Institute, College Station, TX USA 77843-3366.**

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Job Opportunities on



The Diamond synchrotron light source is the largest scientific facility to be built in the UK for over thirty years and will be located at Rutherford Appleton Laboratory in Oxfordshire. The Diamond facility will consist of three accelerators – a 100 MeV linac, a 3 GeV booster synchrotron and a 562m circumference 3 GeV storage ring. Diamond should be operational towards the end of 2006 with an initial complement of 7 synchrotron radiation beamlines. DLS Ltd have a number of openings for physicists and engineers of different grades within the Diamond Technical Division, which has responsibility for the buildings, accelerators, beamline front-ends and insertion devices.

Group Leader / Senior Positions

VN2270: Accelerator Physics
VN2271: Magnets
VN2272: Insertion Devices
VN2273: Pulsed Magnets and Power Supplies
VN2274: Radio-frequency and Linac Systems
VN2275: Beam Diagnostic and Feedback Systems
VN2276: Power Converters
VN2277: Geodesy and Alignment
VN2278: Health Physics
VN2279: Electrical Engineering

Other Positions

VN2280: Systems engineers
VN2281: Personnel safety systems engineer
VN2282: Magnet systems engineer/physicist
VN2283: Accelerator physicist



Successful candidates for all posts are likely to have academic qualifications at first degree level in an appropriate physics or engineering discipline, an appropriate degree of relevant experience for the position in question (preferably in an accelerator environment), self motivation, ability to work effectively in a team and good interpersonal and communication skills. Group leaders will also be expected to have good project and people management skills.

Salary on appointment will be made on the following scales (currently under review), depending on qualifications and experience:



Group Leader / Senior positions: £31,500 - £43,310. In certain cases exceptional candidates with broader experience and able to take on a wider range of responsibilities may be considered for appointment on a scale £39,040 - £53,680. Candidates with less experience but able to take on the full responsibilities of Group Leader in due course may also be considered for appointment on a scale £25,900 - £35,620.



Other positions: £20,410 - £28,060 or £25,900 - £35,620, depending on qualifications and experience.

For an informal discussion about any of these posts please contact **Dr. R. P. Walker, Diamond Technical Director**, tel.: +44(0)1235-446212, e-mail: r.p.walker@rl.ac.uk

Further information about these and future posts, and how to apply, is available from our web site at: <http://www.diamond.ac.uk> or can be obtained from: **HR Operations, Human Resources Division, Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, OX11 0QX.**

Telephone (01235) 445435 (answerphone) or email recruit@rl.ac.uk quoting the appropriate VN number.

Applications should be returned by Friday 12th July 2002

FELLOWSHIP IN EXPERIMENTAL HIGH ENERGY NUCLEAR PHYSICS

The Lawrence Berkeley National Laboratory's Nuclear Science Division is seeking a scientist with outstanding promise and creative ability in the field of experimental high energy nuclear physics. The appointment will be as Divisional Fellow for a term of five years with the expectation of promotion to Senior Scientist. The successful candidate will have several years of experience beyond the PhD in nuclear or particle physics and will be expected to assume a leadership role in the Relativistic Nuclear Collisions (RNC) Program at LBNL.

The RNC group has a key role in the STAR experiment at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. The group currently has a strong physics program in nucleus-nucleus collisions at RHIC and intends to become a major player in spin physics. Candidates having an interest in spin physics at RHIC are encouraged to apply.

Applicants are requested to email a curriculum vitae, list of publications, statement of research interests, and the names of at least five references, no later than October 1, 2002, to afnemployment@lbl.gov. Please reference job number AF/014946/JCERN in your cover letter. LBNL is an EEO/AA employer.



McGill

Research Associate Position in Experimental Subatomic Physics

The McGill University High Energy Physics group invites applications for a position of Research Associate in the ZEUS experiment at HERA.

A broad range of processes is under intense study in deep inelastic scattering, photoproduction and QCD phenomena. The McGill group is responsible for the laser calibration of the calorimeter systems and is involved in the maintenance and running of the calorimeters.

Candidates must have a recent Ph.D. in particle physics with experience in detectors and data analysis. He or she is expected to play an active role in one of the ZEUS physics groups. The initial term of the appointment will be one year, renewable yearly by mutual agreement and subject to funding. The salary will be determined by the successful applicant's experience. The position will be based at DESY, in Hamburg, Germany. Interested individuals should send a CV and have three letters of reference sent before 1st August 2002 to:

Prof. François Corriveau
Physics Department, McGill University
Montréal, QC, H3A 2T8, Canada

In accordance with Canadian immigration regulations, priority will be given to Canadian citizens and permanent residents. All qualified individuals are however encouraged to apply.

Please contact corriveau@physics.mcgill.ca for more information. Applications will continue to be taken until the position is filled.

McGill University is committed to equity in employment.

Postdoc and Research Faculty Positions in Particle/Astrophysics



National Taiwan University

The National Taiwan University HEP (NTUHEP) group has several postdoc positions available immediately, or starting August. We seek energetic persons to work on 1) Belle analysis, or 2) maintaining our EFC subdetector or Belle SVD2 subsystem, or 3) CMS Preshower electronics, or 4) a novel neutrino telescope (NuTel). Expansion into particle astrophysics is planned.

NTUHEP is a major player in rare decays and CP violation studies at Belle, contributing so far K pi0, eta prime K, color suppressed and rare baryon etc. measurements or first observations. We are also active in two photon physics. We are fully responsible for CMS Preshower Motherboard, and have started NuTel design based on PMT readout towards "seeing AGN/GC through a mountain" (<http://hep1.phys.ntu.edu.tw/vhntw/Summary.txt>). Under a new aggressive expansion plan aimed at developing the experimental arm of the NTU Astrophysics Institute, we are venturing into gamma ray astrophysics, where, if approved, we will join the GLAST space telescope project which would allow for many more positions.

We seek qualified candidates with a Ph.D. degree in experimental particle (or cosmic ray and astroparticle) physics. Flexible arrangements can be accommodated between Belle or CMS or NuTel, hardware or analysis. A strong candidate can be considered for appointment as research faculty, or as engineering physicist where appropriate. Appointees would have a choice to join the new GLAST effort. The interested person should send CV, Publications, and 2 reference letters (sent directly by referees; 3 or more for faculty) immediately to:

Prof. Y. Bob Hsiung, Department of Physics, National Taiwan University,
Taipei, Taiwan 10764, R.O.C.
hsiong@hep1.phys.ntu.edu.tw
fax: +886-2-23693472, tel: +886-2-33665135

Prof. George W.S. Hou, Department of Physics, National Taiwan University,
Taipei, Taiwan 10764, R.O.C.
wshou@phys.ntu.edu.tw
fax: +886-2-23693472, tel: +886-2-33665096

RESEARCH PHYSICISTS

Applications are invited from experimental particle physicists with a strong research record for any of the following three positions within the Particle Physics Department based at the Rutherford Appleton Laboratory. The 3 vacancies are for a Division Head (Band 2), Group Leader (Band 3) and a Particle Physicist (Band 4).

An interest in advanced detector development, particularly vertex detectors, or in the linear collider machine or detector, or in advanced computing techniques for particle physics, or in neutrino physics would be an advantage, as would experience in project management and leadership, especially for the more senior positions.

Applicants should possess a Ph.D. in Experimental Particle Physics, have demonstrable leadership ability or the potential, excellent communication skills, be a team player and have good organisational skills including the ability to write clear and concise policies and other documents.

The post is based at the Rutherford Appleton Laboratory, but the holder will be expected to travel regularly within the UK and overseas.

The salary at appointment will depend upon age and experience, and will be on a scale from £25,900 to £48,800.

Application forms and a job description can be obtained from HR Operations, Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, OX11 0QX. Telephone (01235) 445435 (answerphone) or email recruit@rl.ac.uk quoting reference number VN2268. More information about RAL can be obtained from the World Wide Web pages at <http://www.cclrc.ac.uk>

Further details can be obtained from Prof. Ken Peach at k.j.peach@rl.ac.uk

All applications must be returned by 15th July 2002.

Interviews will be held in August 2002.

CCLRC is committed to
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is in operation.



COUNCIL FOR THE CENTRAL LABORATORY
OF THE RESEARCH COUNCILS

MIT

TENURE TRACK FACULTY POSITION

The MIT Department of Physics is seeking exceptional candidates for a Tenure Track Faculty Position in the Division of Experimental Particle and Nuclear Physics and the Laboratory for Nuclear Science, to start in July 2003. The research groups in the division and LNS have strong interests in QCD (PHOBOS, BLAST, Jefferson Lab., Mainz and HERMES), flavor physics and electroweak symmetry breaking (BaBar, CDF, ATLAS, and CMS), dark matter searches (AMS and axions) and neutrino physics (SuperKamioke and Borexino). Strong candidates in new areas of experimental nuclear and particle physics are particularly welcome. (See <http://pierre.mit.edu/> for a description of current research activities). Faculty members at MIT teach undergraduate and graduate physics courses, serve as mentors and advisors and oversee the students' research projects. Candidates must show promise in teaching as well as in research. Preference will be given to applicants at the Assistant Professor level. The deadline for applying for this position is September 1, 2002.

Applicants should send a curriculum vitae, list of publications, three reference letters, and a short statement of proposed research to:
Prof. Peter Fisher, MIT, 44-118, 77 Massachusetts Avenue,
Cambridge, MA, 02139-4307.



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CORNELL UNIVERSITY

COMPUTING PROFESSIONAL/ RESEARCH ASSOCIATE

The elementary particle physics group at Cornell University has an opening for a Computing Professional/Research Associate to work on projects related to the CLEO/CLEOc experiment and R&D for a Linear Collider. The person filling this appointment will have major responsibilities for the upgrade, optimization, and maintenance of the CLEO offline analysis software, databases for calibration and data access, and eventually software development for a Linear Collider. Membership in the CLEO Collaboration and the opportunity for half-time data analysis are possible though such activities are not required.

A PhD in experimental elementary particle physics or advanced degree in Computer Science, and at least 3 years experience with software development are required. Expertise is necessary in the following areas: The UNIX operating system, object-oriented programming, C++, UNIX shell scripting, and large-scale software design. It is also highly desirable for the applicant to have familiarity with the computing tasks common in experimental high energy physics such as data management, physics analysis, and Monte Carlo simulations, as well as LINUX, FORTRAN, and code management and versioning systems.

Please send an application including curriculum vitae, publication list, and resume of computer experience, and arrange for at least three letters of recommendation to be sent to

Prof. Lawrence Gibbons,
Newman Laboratory, Cornell University,
Ithaca, NY 14853.

E-mail correspondence may be directed to search@lms.cornell.edu

Cornell is an equal opportunity/affirmative action employer.
Women and minorities are encouraged to apply.

HEAD OF COMPUTING DIVISION

Fermi National Accelerator Laboratory, dedicated to fundamental research in particle physics and related fields, and home to the world's highest energy accelerator, has an exceptional opportunity available for a professional to lead one of its four major scientific divisions.

The Computing Division at Fermilab is highly coupled to the physics program of the laboratory. It supports all scientific computing in the laboratory's program, including the CDF and D0 Collider experiments currently running at the world's most powerful particle accelerator, the planned neutrino experiments MiniBooNE and MINOS, and the anticipated flavor experiments CKM and BTeV. The Computing Division is also the host division for the Experimental Astrophysics Group (Sloan Digital Sky Survey, PRIME), the Fermilab Lattice Gauge Theory Facility and a Tier 1 center for the CMS experiment at the Large Hadron Collider in Geneva, Switzerland. The Division furnishes and operates the campus-wide network, and several computing facilities, including central facilities in the Feynman Computer Center (FCC). These facilities include large computer clusters for simulation, reconstruction and analysis of scientific data as well as substantial data storage capacities of more than one Petabyte of robotic tape storage and about one hundred Terabytes of disk storage.

The Division assists in developing systems requirements for future computing and storage needs, and also develops the software for operating these systems as required. The Division staff has a substantial involvement in the development of scientific software, including physics simulation and computational codes. Many of these activities are carried out in collaboration with the worldwide high-energy physics community. The Division receives substantial support for these activities from competitively awarded funding sources. The Division staff supports the data acquisition systems of experiments. The Division manages Fermilab's high bandwidth connections to public and private wide area networks that support its worldwide scientific collaborations. The Division supports the general computing infrastructure at the Laboratory, including many aspects of computer security.

Reporting to the Fermilab Director of Research, the selected candidate will lead more than 250 computer professionals, engineers, technicians and physicists to work effectively with the large physics collaborations at Fermilab. Specific responsibilities include contributing to the setup and operation of LHC computing, supporting the US scientific HEP community involved in the LHC program, supporting the computing infrastructure of the Laboratory, and participating in R&D projects to prepare computing for future HEP programs.

Qualified candidates must possess the capability to provide leadership in the operational, computing, R&D, and physics roles of the Division. A broad and deep understanding of the present state of computing technologies and the trends that project these technologies into the future, both in the commercial, open source, and academic computer science sectors, is required. Management and organizational skills in a highly technical environment are essential, as is exposure to science, based on large facilities and dispersed collaborations of scientists. The individual selected must be familiar with Department of Energy regulations and take responsibility for elements of the Laboratory's computing in these matters. Experience in high-energy physics is an advantage, but not required.

Located 40 miles west of downtown Chicago, we offer a competitive salary and excellent benefits package. For consideration, please submit a resume with salary history, **indicating job code HCD-PT** to: **verbeck@fnal.gov** • EOE M/F/D/V • **www.fnal.gov**



Fermilab

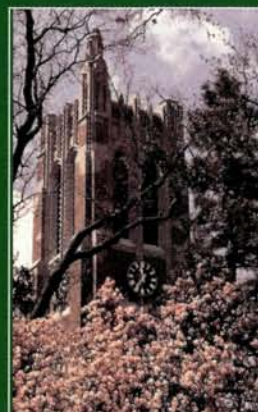
EXCITING OPPORTUNITIES IN ACCELERATOR PHYSICS

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MICHIGAN STATE UNIVERSITY

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- Research Associates • Graduate Students



Broad areas of interest including:

- Beam dynamics • Ion source development
- Heavy ion linac design • Cryogenic systems
- Superconducting radio frequency (SRF) structure design & development • SRF drive and feed back systems
- Electro-magnetic systems design for nuclear physics research

For details, go to

<http://www.nsl.msu.edu/ourlab/employment/index.php>

Computer Scientist

The Center for Data Intensive Computing and the Physics Department at Brookhaven National Laboratory together seek a computer scientist or computationally oriented physicist in the general area of grid computing, distributed data access, and/or the storage and analysis of petabyte data sets. The successful candidate will demonstrate an ability to conduct an independent research program and to work with Laboratory research programs.

Brookhaven is home to RHIC, the Relativistic Heavy Ion Collider and the U.S. ATLAS Program and a participant in the Particle Physics Data Grid (www.pdg.net) and GriPhyN (www.griphyn.org). CDIC is engaged in advanced scientific computing and is closely affiliated with the Departments of Applied Mathematics and Statistics and Computer Science at SUNY Stony Brook (www.bnl.gov/cdic). Minimal requirements include a Ph.D. in computer science, electrical engineering, physics or a related field with a strong background in computer science. Interested candidates should send a CV, statement of research interests, and the names of three references to: **J. Glimm, Director, CDIC, Bldg. 463B or T. Wenaus, Department of Physics, Brookhaven National Laboratory, P.O. Box 5000, Upton, NY 11973**; or by e-mail to: **Claire Lamberti (lamberti@bnl.gov)**.

Brookhaven National Laboratory is funded primarily by the U.S. Department of Energy. It conducts basic and applied research in high energy and nuclear physics, life sciences, materials, energy and environmental science and national security. For more information, visit our web site at www.bnl.gov.

BNL is an equal opportunity employer and encourages applications from minorities and women.

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Director

Brookhaven Science Associates LLC (BSA), a partnership of Battelle Memorial Institute and Stony Brook University, announces the search for Director of the Brookhaven National Laboratory (BNL).

Brookhaven National Laboratory, located on Long Island in Upton, New York, is one of five multipurpose laboratories operated by the Office of Science of the U.S. Department of Energy. Since its founding in 1947, the Laboratory's primary mission has been scientific research in fields requiring unique, complex and often large facilities, and the design, construction and operation of those facilities for external users as well as for its own scientists. BNL research departments are organized in four directorates: Nuclear and High-Energy Physics, Basic Energy Sciences, Life Sciences, and Energy/Environment/National Security. The Laboratory has over 3,000 employees, an annual budget exceeding \$400 million, and more than 4,500 scientist users of its facilities per year.

The Director serves as President of BSA and Chief Executive of the Laboratory. The new director must have strong scientific credentials, experience working with governmental agencies, experience with research management or a record of successful senior management of large-scale projects, qualities that suggest success in engaging all the stakeholders associated with the functioning of a national multipurpose laboratory, and strong leadership skills including success in crafting and implementing vision and strategy for a major organization.

Nominations and expressions of interest should be submitted, in total confidence, to:

Shelly Weiss Storbeck, Managing Director
A.T. Kearney Education Practice
333 John Carlyle Street
Alexandria, VA 22314
Telephone: 703-739-4613;
Fax: 703-518-1782

E-mail may be addressed to shelly.storbeck@atkearney.com.

For best consideration, please submit materials no later than August 1, 2002. Electronic submissions are particularly encouraged.

Further information about BNL can be found on the website: www.bnl.gov

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Laboratory for Instrumentation and Experimental Particle Physics Departamento de Física da Universidade de Coimbra, 3004-516 Coimbra, Portugal

The Coimbra branch of LIP anticipates the opening of **staff positions for experimental physicists**. Only applicants with a solid CV in the areas of Experimental Particle Physics or related Instrumentation and, at least, two years experience after PhD will be considered*.

The present activity of LIP-Coimbra ranges from particle physics (ATLAS, HERA-b, and n-ToF) to the development of radiation detection systems, mainly gaseous and liquid noble gas detectors. Besides the referred to experiments, some areas of application of the detectors under study are imaging (medical PET, with liquid xenon; monitoring of radiotherapeutical beams and neutron radiography, with GEMs; ToF-PET, with fast RPCs), time of flight of charged particles (fast RPCs) and dark matter search (liquid xenon).

For details, candidates may consult <http://www.coimbra.lip.pt>

Questions, declaration of interest or early submission of CVs should be addressed to seclip@lipc.fis.uc.pt

*Post-doctoral fellowships, supported by other programmes, are also available.

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Deutsches Elektronen-Synchrotron
Experiments at the VUV-FEL



In international cooperation the research center DESY plans and develops an innovative future project: TESLA, a 33 km long, superconducting linear accelerator with integrated X-ray lasers.

Research at TESLA covers a broad field; from structure analysis to material science and life science. For this challenging project we seek a

Physicist for research at the VUV – Free Electron Laser

At the TESLA Test Facility a Free Electron Laser is under construction, that will offer unique possibilities for research within the 100 to 6 nm wavelength. We are currently looking for a physicist (PhD) to carry out experiments on molecules and clusters and for the development of experimental methods. Experience in the field of the interaction of intense lasers with matter, or in the field of research with synchrotron radiation would be an advantage.

The contract period is two years with the possibility for prolongation by one additional year. The salary will be according to the German civil service (BAT IIa).

We welcome applications from all sectors of the community, including women and people with disabilities.

To apply, please send your application documents including your CV and three references to our Personnel Department at the address below. Further information can be obtained from Dr. Thomas Moeller (Thomas.Moeller@desy.de).

Deutsches Elektronen-Synchrotron DESY

in der Helmholtz-Gemeinschaft
code: 75/2002 • Notkestraße 85 • D-22603 Hamburg • Germany
Phone: +49 (0)40/8998-2527 • www-hasylab.desy.de
email: personal.abteilung@desy.de

Deadline for applications: 15.08.2002

CERN COURIER RECRUITMENT BOOKING DEADLINE

September issue: 02 August
Publication date: 15 August

Contact Ed Jost:

Tel. +44 117 930 1196

Fax +44 117 930 1178

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CHEZ LE LIBRAIRE

The Atom in the History of Human Thought par Bernard Pullman (ancien professeur de chimie quantique à la Sorbonne et directeur de l'Institut de Biologie Physico-Chimique, France), Oxford University Press, ISBN 0195114477, £14,95 (€23).

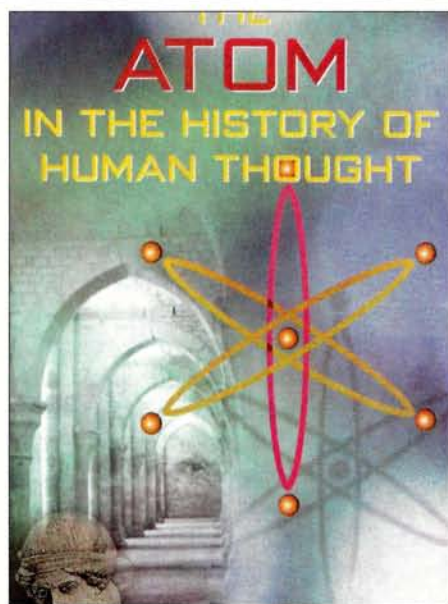
Traduction de "L'atome dans l'histoire de la pensée humaine", Editions Fayard, ISBN 2213594635, €29,3.

"Ce livre s'attache à décrire les relations tumultueuses entre la théorie atomique, la philosophie et la religion pendant 25 siècles," peut-on lire dans la préface. Une tâche difficile à tout point de vue. Pullman reconnaît qu'il n'est ni un philosophe, ni un homme de religion, mais un chimiste "qui a longtemps côtoyé les atomes". A ce titre, il a beaucoup œuvré.

L'ouvrage commence avec la naissance de la théorie atomique – le "miracle grec", selon les propres mots de Pullman, du VII^e au V^e siècles av. J-C, lorsque quelques penseurs hellènes délaissent le panthéon grec au profit d'une philosophie de la nature. Des théories commencent par mettre en avant diverses substances primordiales – l'eau (Thalès), l'air (Anaximène), le feu (Héraclite) et la terre (Xénophane), dont procède toute chose. Les deux notions de base de l'atomisme – les atomes (atomos), corpuscules impénétrables et indivisibles, et le vide – sont formulées vers 450 av. J-C par Leucippe et Démocrite, puis précisées un siècle plus tard par Epicure et Lucrèce qui en font une structure logique restée pour l'essentiel inchangée pendant 2000 ans. Le livre aborde également l'atomisme hindou et bouddhiste, qui s'est développé indépendamment, vers la même époque, mais n'a eu aucune influence sur la théorie atomique en Occident.

Il s'attarde ensuite sur "quelques résurgences sporadiques" entre le I^{er} et le X^e siècles ap. J-C. Il décrit la position anti-atomiste de l'Eglise, incarnée par Basile de Césarée, Saint Augustin et Saint Thomas d'Aquin (entre autres), et fait allusion à certains atomistes chrétiens du Moyen Âge, qui se divisent entre chroniqueurs (comme Isidore de Séville), sympathisants et partisans. Adélard de Bath (traducteur de textes scientifiques arabes) et Thierry de Chartres (qui a fait revivre les œuvres de l'Antiquité) font partie des sympathisants. Constantin l'Africain, un médecin de Carthage qui a défini explicitement les atomes comme les constituants fondamentaux des substances, figure au nombre des partisans, tout comme Guillaume de Conches et Guillaume d'Ockham.

L'ouvrage aborde également la philosophie juive du IX^e au XIII^e siècles. Elle s'oppose largement à l'atomisme, même si Moïse Maïmonide (1135-1204) a décrit l'enseignement des



atomistes arabes. Les Karaites, une secte juive schismatique fondée au VIII^e siècle, adoptent la théorie atomique empruntée aux enseignements des philosophes et théologiens musulmans.

Alors que l'atomisme grec doit libérer l'humanité des puissances invisibles, l'atomisme arabe est de nature résolument religieuse. La doctrine atomique arabe est exprimée dans le Kalam, un ensemble de douze propositions dont l'une se réfère à la notion "d'accidents". Ils ont lieu dans les atomes et se caractérisent entre autres par la vie, l'intelligence et des propriétés inertes comme la couleur et l'odeur.

Passant à la Renaissance et au Siècle des Lumières, Pullman décrit la résurgence de la théorie atomique commencée avec Pierre Gassendi, qui compte au nombre des atomistes chrétiens aux côtés de Galilée, Bruno, Newton et Boyle. Adversaire d'Aristote, il renoue avec les anciens atomistes, notamment Epicure dont il s'efforce de faire accepter les enseignements par l'Eglise. La doctrine de John Locke, qui doute d'une future preuve expérimentale de l'existence de ces atomes, est caractérisée comme un "atomisme agnostique". Pullman s'attarde également sur les atomes sensibles et intelligents de Maupertuis et Diderot, les atomes matérialistes de Holbach et sur Maxwell qui pense que les atomes existent grâce à l'intervention d'un créateur.

Faisaient partie des anti-atomistes chrétiens, ces philosophes ou scientifiques qui utilisent des arguments religieux pour rejeter la théorie, Descartes, qui nie la notion de vide et Leibniz, qui croit aux atomes métaphysiques (monades). Sont également mentionnés Roger Boscovich, qui a essayé d'associer les monades de Leibniz aux lois d'attraction et de répulsion de Newton, George

Berkeley, qui rejette les notions de matière, de corpuscules matériels et de vide, et Emmanuel Kant qui est qualifié "d'atomiste devenu anti-atomiste".

La dernière partie du livre est consacrée à l'ère moderne avec l'avènement de l'atomisme scientifique aux XIX^e et XX^e siècles. Pullman commence avec la mise à mort de la théorie des quatre éléments, vieille de 2000 ans, par la démonstration de la structure composée de l'eau (Lavoisier) et de l'air (Cavendish et Priestley). Les éléments sont alors définis comme des substances indivisibles. La confusion règne quant à la nomenclature jusqu'à ce que Cannizzaro ne distingue les atomes des molécules en 1860. Peu après, Mendeleev positionne les 63 premiers éléments dans le tableau de classification périodique.

La controverse, toutefois, se poursuit. Les philosophes Hegel et Schopenhauer sont tous deux opposés à l'atomisme de même que certains anti-atomistes jusqu'au-boutistes comme Berthelot, Mach et Ostwald et quelques autres que Pullman qualifie de "philosophes nostalgiques" comme Nietzsche, Marx et Bergson.

Néanmoins, la théorie atomiste est presque universellement acceptée lorsque J.J. Thomson découvre l'électron en 1897, mettant un terme à la théorie des atomes indivisibles.

Pullman nous entraîne ensuite dans l'ère quantique en 1900 avec la célèbre constante de Planck. Il nous guide au fil de découvertes avec Rutherford qui conclut en 1911 que les atomes sont constitués principalement de vide avec un minuscule noyau entouré d'électrons, et Bohr qui observe en 1913 que la constante de Planck aboutit à des orbites stables dans les atomes et à des raies spectrales discrètes. Les autres grands moments de l'histoire atomique moderne sont minutieusement relatés, notamment la découverte du neutron par Chadwick en 1932, le postulat de de Broglie sur le caractère ondulatoire des particules de matière, ultérieurement confirmé par Davisson et Germer, et la mécanique ondulatoire de Schrödinger à l'origine de graves difficultés conceptuelles parmi les scientifiques.

L'auteur étant un chimiste, une large place est faite aux liaisons chimiques. La liaison covalente, par laquelle des atomes mettent en commun des électrons, amène Pullman à une intéressante analogie développée dans le chapitre "Société des atomes: le mariage", où il conclut que "comme toujours dans la vie, cela suppose la capacité et même l'obligation de donner et de recevoir".

Dans le dernier chapitre, Pullman nous plonge dans le monde nanométrique. Il décrit de quelle manière le microscope à effet tunnel et le microscope à force atomique ont permis de

visualiser et manipuler des atomes uniques interagissant avec des surfaces massives, et les pièges à ions d'isoler complètement des atomes uniques (chargés) entourés de vide.

Personne ne peut nier que les atomes conçus il y a 2500 ans en tant que concepts philosophiques invisibles, indivisibles et impénétrables sont devenus aujourd'hui des objets divisibles, visibles et bien réels. Mais sont-ils vraiment intégrés à la pensée humaine? Ils le sont certainement dans celle des scientifiques et des philosophes, mais je doute qu'ils le soient dans celle du grand public, comme le laisse entendre Pullman lorsqu'il déclare que "la physique quantique a suscité un intérêt pour le 'problème de Dieu' parmi le grand public". Cet ouvrage est un peu desservi par un index difficile à utiliser et parfois inexact. Ceci dit, la lecture de ce livre qui regorge de notes instructives est un exercice éducatif très utile.

Horst Wachsmuth, CERN.

Handbook of Radiation Effects par Andrew Holmes-Siedle et Len Adams, 2e éd. (2002), Oxford University Press, ISBN 019850733X, €102.

Cet ouvrage est destiné aux spécialistes (ingénieurs et physiciens appliqués) utilisant des systèmes et matériaux électroniques exposés aux rayonnements. Il vise avant tout à expliquer comment instaurer une tolérance aux rayonnements dans les grands systèmes électroniques. Le lecteur est supposé connaître la théorie et les principes de fonctionnement des différents dispositifs. Si ce manuel porte essentiellement sur les composants utilisés dans l'espace, il aborde également des questions spécifiques à d'autres domaines comme la physique des hautes énergies.

Pour commencer, le livre passe brièvement en revue les notions de rayonnement, les unités et les principes de détection des rayonnements, puis donne un aperçu des différents environnements radioactifs susceptibles de détériorer des systèmes et dispositifs électroniques comme ceux rencontrés dans l'espace, dans les domaines de la production d'énergie (fission et fusion), de la physique des hautes énergies et des applications militaires (armes nucléaires). Suit un chapitre consacré à une description générale des effets fondamentaux des rayonnements sur les matériaux et les dispositifs: déplacement et ionisation d'atomes, coloration de matériaux transparents, phénomènes isolés et autres effets transitoires.

Sept chapitres centraux constituent le cœur du manuel et traitent en détail les mécanismes responsables de l'altération des performances de différents dispositifs. A chaque chapitre correspond une catégorie de dispositifs: MOS, transistors

bipolaires et circuits intégrés, diodes et dispositifs opto-électroniques comme les phototransistors et les DCC, semiconducteurs de puissance, différents types de capteurs et divers composants électroniques. L'ouvrage examine les problèmes, sur le plan de la physique, des effets des doses totales, la manière de prédire les changements électriques provoqués dans des dispositifs MOS, ainsi que certaines des meilleures solutions au problème des rayonnements. Les effets à vie longue, qui peuvent être subdivisés entre mécanismes de surface et mécanismes de volume, des différents types de rayonnements sur des transistors bipolaires sont décrits. La manière dont ces effets influencent la réponse aux rayonnements des circuits bipolaires intégrés est examinée. Un chapitre est entièrement consacré à la réponse aux rayonnements d'un grand nombre de diodes de types différents. Dans un environnement hostile, les dispositifs opto-électroniques sont soumis à de multiples effets et les rayonnements peuvent provoquer des dysfonctionnements dans un système de haute technologie nécessitant des réglages poussés. Les dispositifs électriques en silicium dans les sous-systèmes électriques des grands équipements spatiaux, les équipements générant des rayonnements et les sources d'énergie nucléaire sont également endommagés par les rayonnements. Un chapitre est consacré à l'examen des aspects pratiques, physiques et chimiques liés aux fenêtres, lentilles, revêtements et fibres optiques. Un autre chapitre se concentre sur les effets des rayonnements sur les polymères et autres matières organiques, classe les principales formes de dégradation organique sous l'effet d'une irradiation et récapitule les principaux polymères rencontrés dans les domaines de la technologie et de la science, ainsi que les problèmes qu'ils posent.

Deux chapitres sont consacrés aux aspects du blindage des dispositifs électroniques contre les rayonnements et aux diverses méthodes de calcul pour le transport des particules, en se référant essentiellement aux applications spatiales (écrans très minces). Les trois derniers chapitres portent sur les essais d'irradiation, le durcissement d'équipements et la garantie de radiorésistance. Les semiconducteurs et les dispositifs électroniques n'ayant pas la même sensibilité aux rayonnements, il est impossible de se fonder uniquement sur la théorie pour prédire l'effet sur un dispositif d'une exposition donnée à un certain type de rayonnement. Il est donc indispensable de procéder à des essais d'irradiation. Les auteurs donnent des indications sur les sources de rayonnement pouvant être utilisées dans les essais d'irradiation, les procédures d'essai et les normes

techniques. Enfin, ils examinent les technologies et les méthodologies utilisées dans la fabrication de dispositifs radiorésistants, et présentent des règles concernant le durcissement aux différents types de rayonnements pour diverses applications, y compris les équipements télécommandés et les robots.

Chaque chapitre se termine par un récapitulatif des points les plus importants. En plus de l'index thématique, un index par auteur facilite considérablement les recherches à travers les nombreuses références indiquées à la fin de chaque chapitre. Par rapport à la première édition (1993), le manuel a été enrichi de nombreuses références de sites Web utiles, y compris de bases de données. Curieusement, les anciennes unités rads, rems et curies sont utilisées dans tout le manuel, les unités SI figurant entre parenthèses. Les auteurs reconnaissent qu'ils ont eu du mal à choisir et ont finalement opté pour l'ancien système.

Il est regrettable que ce volume, par ailleurs excellent, contienne ici et là un certain nombre d'erreurs typographiques et de ponctuation, voire des inexactitudes dans certaines formules. Des paragraphes voisins contiennent parfois des affirmations contradictoires. On a l'impression que le texte n'a pas été relu avec suffisamment d'attention avant l'impression. Certaines affirmations sont même clairement fausses, comme celle selon laquelle les rayons X et gamma ne laissent aucune activité dans le matériau irradié (quid des réactions photonucléaires au-delà d'un certain seuil?), et d'autres prêtent à confusion, comme la discussion sur la dose totale absorbée par les personnes du public. En général, les phénomènes d'activation et les problèmes afférents sont également quelque peu sous-estimés tout au long du manuel. Cet ouvrage contient néanmoins une grande quantité d'informations valables et n'est pas seulement un guide, mais aussi un excellent manuel.

Marco Silari, CERN

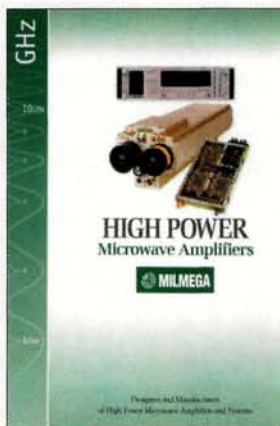
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Quarks, Leptons and the Big Bang (2e édition) par Jonathan Allday, Institute of Physics Publishing, ISBN 0750308060, €27.

Cette édition est une version revue et mise à jour de la célèbre introduction à la physique des particules et à la cosmologie du professeur de la King's School de Canterbury, destinée aux enseignants du secondaire.

Deparameterization and Path Integral Quantization of Cosmological Models par Claudio Simone, World Scientific, ISBN 9810247419, €30.

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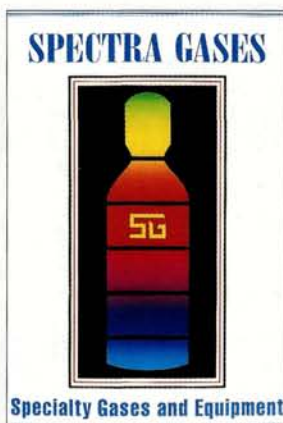
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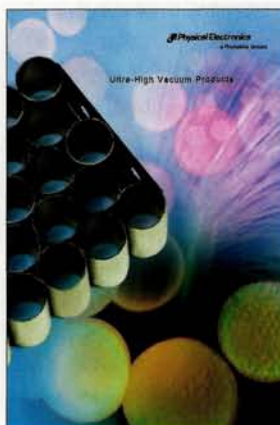


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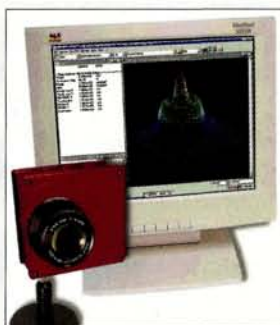
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