

People and things

Retiring ECFA Chairman Jean Sacton of Brussels (left), seen here with CERN's LEP Project Director Emilio Picasso.

(Photo CERN 274.12.85)

On people

Walter Hoogland, Director of the Dutch national NIKHEF Laboratory in Amsterdam, becomes Chairman of the European Committee for Future Accelerators (ECFA) from 1 January 1988, succeeding Jean Sacton of Brussels.

During his term of office, unexpectedly prolonged last year, Jean Sacton has consolidated ECFA as a forum for all sections of the European particle physics community and has done a great deal to ensure that the European voice is heard on the world stage.

A retirement milestone was passed earlier this year by Gordon Munday. After playing a vital role in coordinating the beams supplied by CERN's Proton Synchrotron (PS) with the vagaries of physics requirements, he went on to become Leader of the PS Division from 1973 to 1981, overseeing the evolution of the PS from a proton accelerator in its own right to a beam factory for other machines. In recent years he has put in much unstinting work as Chairman of CERN's Staff Policy Group and as Deputy to Technical Director Giorgio Brianti.

Moves at Fermilab

William A. Bardeen has become Head of Fermilab's Theoretical Physics Department, succeeding Chris Quigg who recently moved to the Central Design Group of the proposed US Superconducting Super Collider (SSC) as Deputy Director for Operations.

Jeffrey Appel becomes the Head of Fermilab's Computing Depart-



ment, succeeding Hugh Montgomery who moves to the Research Facilities Department and becomes spokesman of experiment E665 in the Tevatron muon beam. Jack Pfister continues as Associate Head of the Computing Department, with primary responsibility for central computing.

▼ The 1987 JINR-CERN School of Physics, held at Varna, Bulgaria, in September was the tenth in the series organized by the Joint Institute for Nuclear Research (JINR, Dubna, USSR) and CERN. Seen here, left to right, at the School are CERN Director General Herwig Schopper, P. K. Markov of Bulgaria's Institute of Nuclear Energy and Nuclear Research, and Ch. Christov, Academician of the Bulgarian Academy of Sciences.



SCIENTISTS/ ENGINEERS/ COMPUTER PROFESSIONALS

Brookhaven National Laboratory, one of the nation's leading R & D facilities, has a number of challenging opportunities within our National Synchrotron Light Source Department. The NSLS provides synchrotron radiation to a large multi-disciplinary user community. In order to provide the next generation of solid state devices, the XLS Program has been initiated to supply the synchrotron radiation of 10 Å wavelength peak to serve as a source for X-ray micro-lithography. Two additional storage rings, one with room temperature dipoles, the other with superconducting dipoles, plus a full-energy injector linear accelerator are contemplated. These synchrotrons are designed to serve as models for future machines to be built by U.S. industry. The following are brief descriptions of available positions:

Accelerator Physicists

Accelerator Physicists with experience in the design, construction and operation of particle accelerators, in particular electron storage rings for high energy physics experiments or synchrotron radiation production. Individuals are expected to have capacity for independent work and for coordinating teamwork.

Electrical Engineers

Requires BS/MS in electrical engineering with a minimum of 5 years' design and development experience. Numerous positions exist requiring knowledge in one of the following areas: high power radiofrequency systems, analogue and digital feedback circuitry, computer control systems, or highly regulated dc power sources.

Mechanical Engineers

Requires MS in mechanical engineering or equivalent with 5 years' experience. Candidate should have sound knowledge of engineering principles, experience in mechanical design, heat transfer and CAD helpful. Responsibilities will include design/construction/operation of mechanical components and systems for the NSLS storage rings and beam lines.

Programmer Analysts

Requires MS or Ph.D. with experience in UNIX™, "C", Ethernet TCP/IP network communications. Experience with real-time control and data acquisition very desirable. Will work on an "accelerator expert emulator" control system for the XLS which can automatically operate and troubleshoot the injector and synchrotron with minimal human intervention.

Brookhaven is located on a campus-like 5,000-acre site on eastern Long Island, New York. Our comprehensive benefits package includes medical, dental and retirement plans, relocation allowances, and 24 days' annual vacation. If you would like to be considered for one of these exciting opportunities, please forward your resume, responding to AD #NSLS, including salary history and requirements, to: Nancy L. Sobrito, Brookhaven National Laboratory, Associated Universities, Inc., Personnel-Bldg. 185, Upton, NY 11973, U.S.A.

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Research Scientists

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Located in Newport News, Virginia, CEBAF will be a 4 GeV high-intensity, continuous wave electron accelerator utilizing superconducting RF technology. Its scientific goal is to study the structure of the nuclear many-body system, its quark substructure, and the strong and electroweak interactions governing the behavior of this fundamental form of matter.

A range of full-time positions is open in the Research Division for scientists who can contribute both to the development of state-of-the-art tools for a new generation of physics experiments and to the long range scientific effort. Significant areas of research during the construction phase will include design of high resolution and large acceptance spectrometers, design of instrumentation for experimental equipment and halls, and development of the physics program.

Applicants should submit a curriculum vitae, a list of publications, and three professional references to: **Employment Manager, CEBAF, 12070 Jefferson Avenue, Newport News, VA 23606.**

CEBAF

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APS

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Argonne National Laboratory plans to construct a 7-GeV Advanced Photon Source, a high-brilliance synchrotron x-ray facility strongly endorsed by national research advisory groups and favorably reviewed by the Department of Energy. Preconstruction R&D and the conceptual design are at an advanced stage. We seek a number of talented R&D scientists.

- **PHYSICISTS**
 - Accelerator design & construction
 - insertion device design
 - synchrotron beamline design
 - x-ray optics.
- **MECHANICAL ENGINEERS**
 - high vacuum systems
 - accelerator and storage ring design
- **ELECTRICAL ENGINEERS**
 - RF power supplies and magnet design
 - accelerator computer control systems
- **CIVIL ENGINEERS**
 - design/construction of research laboratory and accelerator facilities
- **MANAGEMENT/PROJECT ENGINEERS**
 - Management systems
 - Quality control

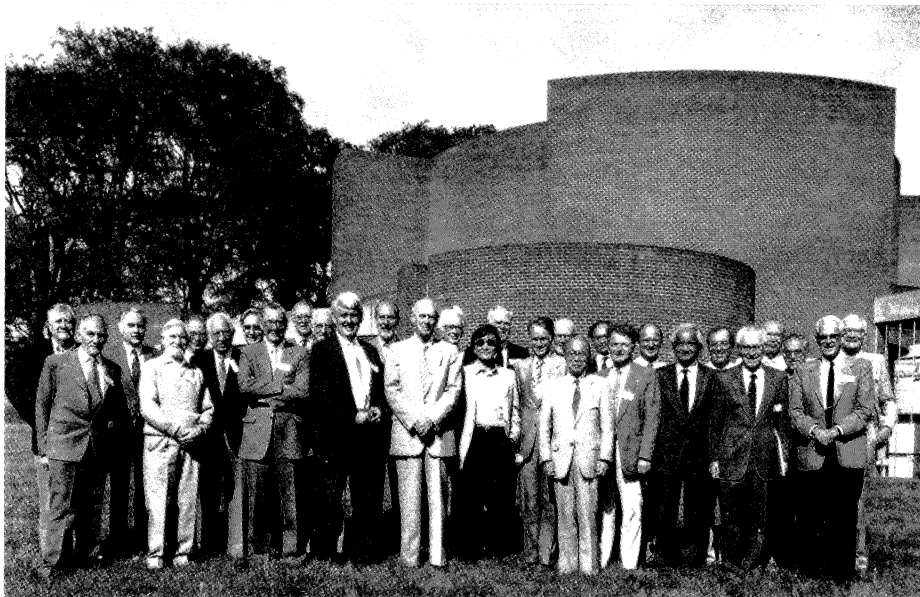
Candidates both experienced and entry-level should submit resume, detailing relevant experience to:



Mr. R.A. Johns, Appointment Officer
Box D-APS-88
Argonne National Laboratory
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Argonne, Illinois 60439

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Participants at the 'Interactions and Structures in Nuclei' meeting held at the University of Sussex, UK, in September to mark the 65th birthday of Denys Wilkinson.



Interactions and Structures in Nuclei

From 7-9 September distinguished physicists from many parts of the world assembled at the University of Sussex in the UK to honour Sir Denys Wilkinson on his 65th birthday. The stimulating and enjoyable meeting also coincided with his retirement as Vice-Chancellor of the University or, as he put it, his 'emergence from retirement' from physics! (In fact his contributions to nuclear physics have continued unabated during his 11 vice-chancellorian years.)

The programme reflected his broad interests over 40 years in many aspects of nuclear and particle physics, astrophysics and cosmology, and there was also frequent mention of his expertise in the field of bird navigation. The talks covered nuclear models (J. P. Elliott), heavy ion radioactivity (G. A. Jones), electromagnetic properties of nuclei (A. Arima, A. Richter),

mesonic and quark effects (M. Rho, A. Faessler), weak interactions (J. Deutsch, E. Warburton, F. Boehm), elementary particles, cosmology and astrophysics (T. Kibble, J. Barrow, M. Goldhaber, W. Fowler), experimental developments (E. W. Vogt, G. Charpak) and symmetries (E. Henley). After-dinner talks in a lighter vein were given by Fay Ajzenberg-Selove on Denys Wilkinson's involvement with the light nuclei and by Ken Allen and Dave Alburger on his contributions to physics in Cambridge, Oxford and Brookhaven.

At the end of the conference Denys Wilkinson discussed some recent developments in nuclear physics, particularly the question as to whether a quark description for the nucleus is needed.

From Roger Blin-Stoyle

1988 CERN School of Physics

The 1988 CERN School of Physics will be organized jointly by the Nuclear Research Centre 'Demokritos', Athens and CERN. Its basic aim is to teach various aspects of high energy physics, but especially theoretical physics, to young experimental physicists, mainly from the Member States of CERN.

It will be held in Lefkada, Greece, from 18 September to 1 October 1988. Further information from the Organizing Secretary, Miss S. M. Tracy, CERN School of Physics, CERN, 1211 Geneva 23, Switzerland.

Asian superstrings

The first and highly successful Asia-Pacific Workshop on High Energy Physics, devoted to Superstrings, Anomalies and Field Theory, was held in Singapore this summer and brought together 60 participants from 12 countries. The opening address was given by Zhou Guangzhao, President of the Chinese Academia Sinica. Invited pedagogical lectures were intended to introduce new subjects from first principles. Talks in this category were: A. P. Balachandran (Wess-Zumino Terms and Quantum Symmetries), C. Itzykson (Conformal and Modular Invariance in 2-dimensional Field Theory) and R. Jackiw (Update on Anomalous Theories). The remaining invited talks covered research results. The second Asia-Pacific Workshop, this time on Collider Physics, is tentatively scheduled for summer 1989 in the People's Republic of China.

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– Kennziffer 122/87 –

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Die Verantwortung für das Zentrum und seine wissenschaftliche Ausrichtung wird ein unabhängiger Wissenschaftlicher Rat (WR) wahrnehmen, der sich aus Vertretern von Hochschulen, Forschungsinstituten und Wirtschaft des In- und Auslandes zusammensetzt.

Aufgabengebiet: Der/die Assistent/in dieses Wissenschaftlichen Rates soll vielfältige Aufgaben bei Aufbau und Betrieb des Zentrums wahrnehmen:

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- Vorbereitung der Entscheidungen des WR,
- wissenschaftliche und administrative Betreuung der Forschungsgruppen,
- Koordination des HLRZ mit KFA, GMO und DESY.

Anforderungen: Promotion in einem mathematisch-naturwissenschaftlichen oder ingenieurwissenschaftlichen Fach, Erfahrungen in der computergestützten Forschung, breite naturwissenschaftlich/technische Bildung, Interesse an Aufgaben des wissenschaftlichen Managements.

Arbeitsplatz wird das Sekretariat des WR sein mit Sitz innerhalb der KFA Jülich. Die Vergütung erfolgt nach den Bestimmungen des Bundesangestelltentarifvertrages (BAT).

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RESEARCH IN ACCELERATOR PHYSICS (Theory)

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An opening exists at the University of Houston for a Post Doctoral Research Associate. Recent Ph.D.'s (0-3 years or equivalent experience) in high energy, nuclear or plasma physics with strong background in computer usage are encouraged to apply.

The work will be in nonlinear beam dynamics, beam-beam interaction in storage rings, high-intensity linacs and other theoretical problems in accelerator physics.

This person will initially work at the Texas Accelerator Center (30 miles north of Houston) with other physicists and engineers from the University of Houston, Texas A & M University, Rice University and University of Texas, Austin.

Applicants should send curriculum vitae with names of three references to:

Sho Ohnuma,
Physics Department,
University of Houston,
University Park,
4800 Calhoun Road,
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Vanderbilt University invites applications for the position of Director, Free Electron Laser Center for Biomedical and Materials Research. The Center is a broadly based interdisciplinary collaboration including researchers from physics, molecular biology, the clinical and biomedical sciences, and materials science. The Center is funded for the construction of a broadly tunable, ultra-short-pulse FEL, and for research on thermal and non-thermal interactions of laser light with matter.

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The selection criteria to be applied in evaluating candidates include: overall scientific excellence; experience in the construction, operation and development of free-electron lasers, storage ring radiation sources, large laser systems, or accelerators; demonstrated ability to attract significant funding for research; and demonstrated ability to manage major experimental research projects.

The deadline for applications is January 15, 1988; the University desires to fill the position no later than the fall semester, 1988. Interested persons should send a curriculum vitae, including the names of at least four references, to:

Professor Norman H. Tolk, Chair
FEL Director Search Committee
Department of Physics and Astronomy
Vanderbilt University, Nashville, TN 37235
(615) 322-6438

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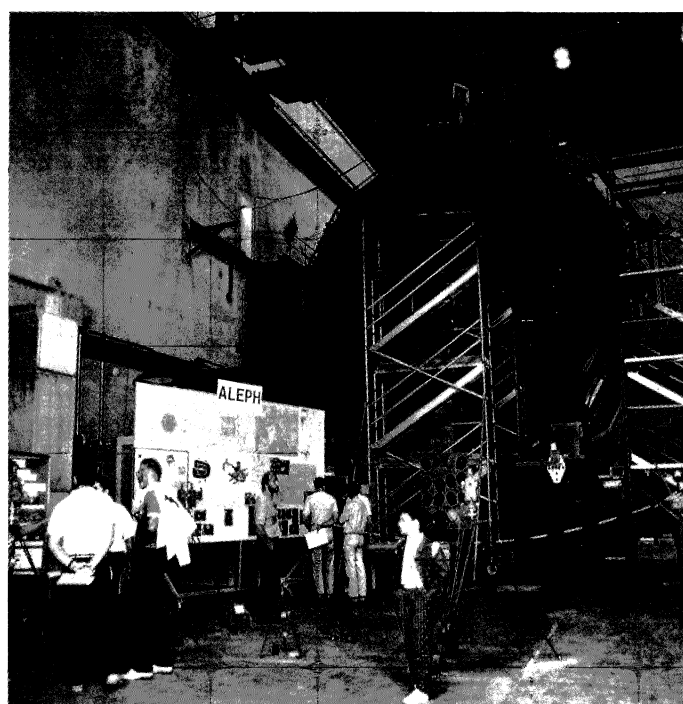
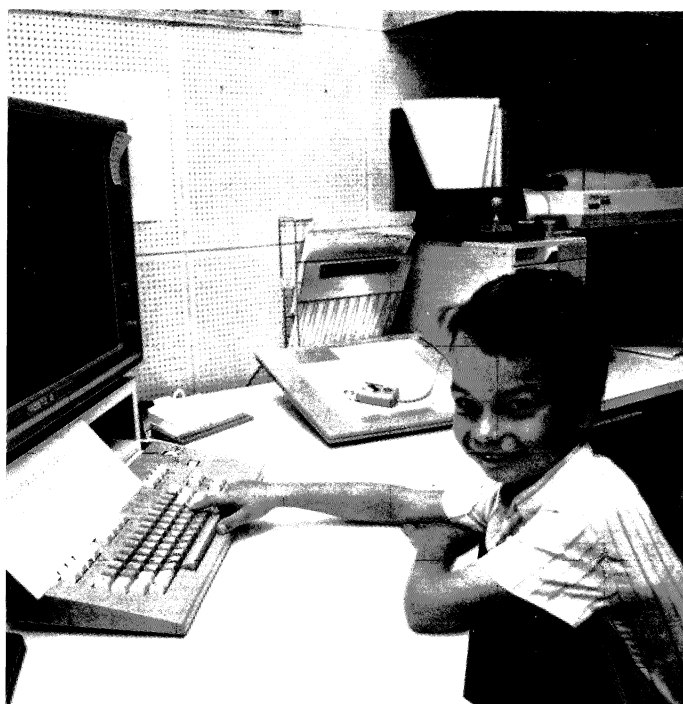


Electronic Mail

The CERN Courier editorial desk can be contacted through electronic mail using the EARN/BITNET communications network. The Editor's address is

COURIER@CERNVM

CERN's Open Day in September was a great success. Among other things, visitors could ride the monorail for the new LEP electron-positron collider (left), try their hand at computing, or be dwarfed by the magnet assembly for the ALEPH experiment at LEP.



Faculty Positions

Experimental High Energy Physics Space Physics Experimental Nuclear Physics

The University of Kansas invites applications for three tenure-track positions at the Assistant or Associate Professor level in the Department of Physics and Astronomy. Individuals having strong research interests, experience, and capabilities in the experimental areas of particle, nuclear, and space physics are sought.

Two positions are tenable in fall, 1988 and one in fall, 1989. Consideration of applicants will begin on January 15, 1988 and continue until these positions have been filled.

Requirements are: PhD in physics and demonstrated research achievement in one of the specified areas. Duties include the conduct and supervision of research as well as graduate and undergraduate teaching. The particle physics group is currently involved in the ARGUS collaboration at DESY as well as research at Fermilab, and is supported by the NSF. The space physics program is currently involved in NASA flight projects for Voyager, Galileo, and Ulysses as well as solar terrestrial research funded by the NSF. The nuclear physics program is currently involved in heavy-ion accelerator physics and is funded by the DOE. Salary range is from \$32,000 to \$45,000 for the 9-month academic year; starting salary and rank depend on qualifications and experience.

Applications should be sent to:

**Professor J.P. Davidson,
Chairman
Department of Physics and Astronomy,
University of Kansas,
Lawrence, Kansas, 66045,**

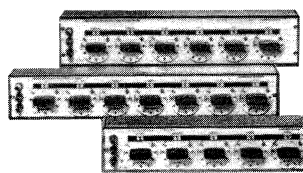
and should include a curriculum vitae, a statement of professional plans and the names of three references.

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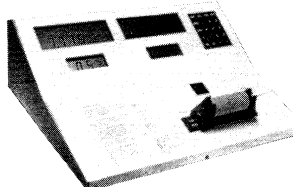
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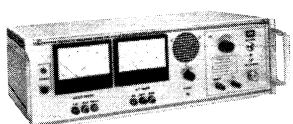
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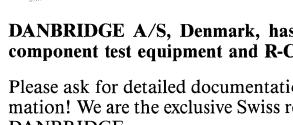
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- testing

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We expect a university education in physics or electrical engineering (specialised in micro-wave engineering) with several years experience in the RF engineering field, preferably with RF accelerators.

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- presentation of our activities and following the worldwide activities of others at conferences.

We expect a university education in physics or electrical engineering. Sound knowledge in the fields of electron beam generation and RF technology is desirable. The ability to work in a team

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– less than $\pm 3 \mu\text{A}$
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Drift less than $\pm 1 \times 10^{-2}$ after 8 h
from 10% to 100% of nominal current
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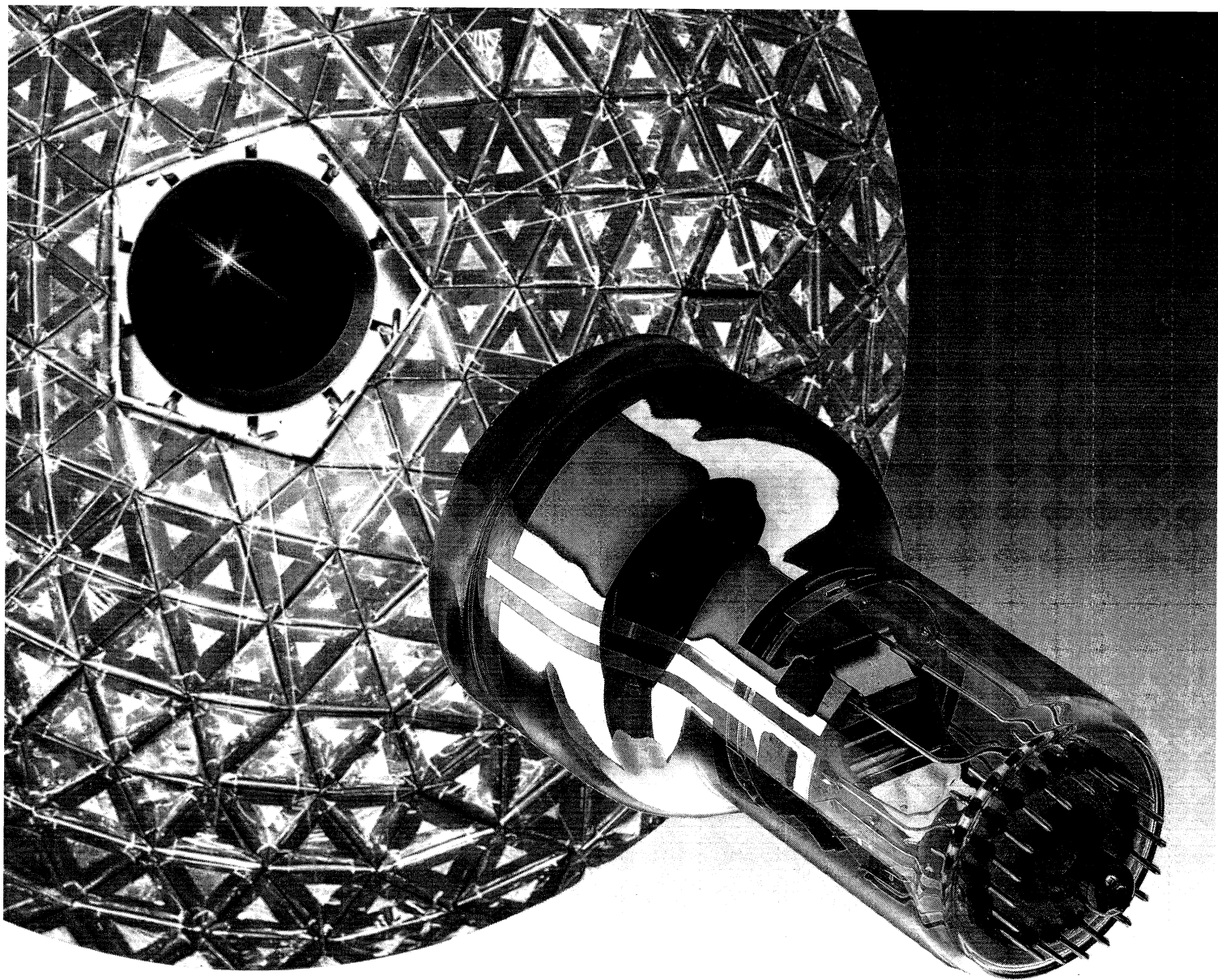
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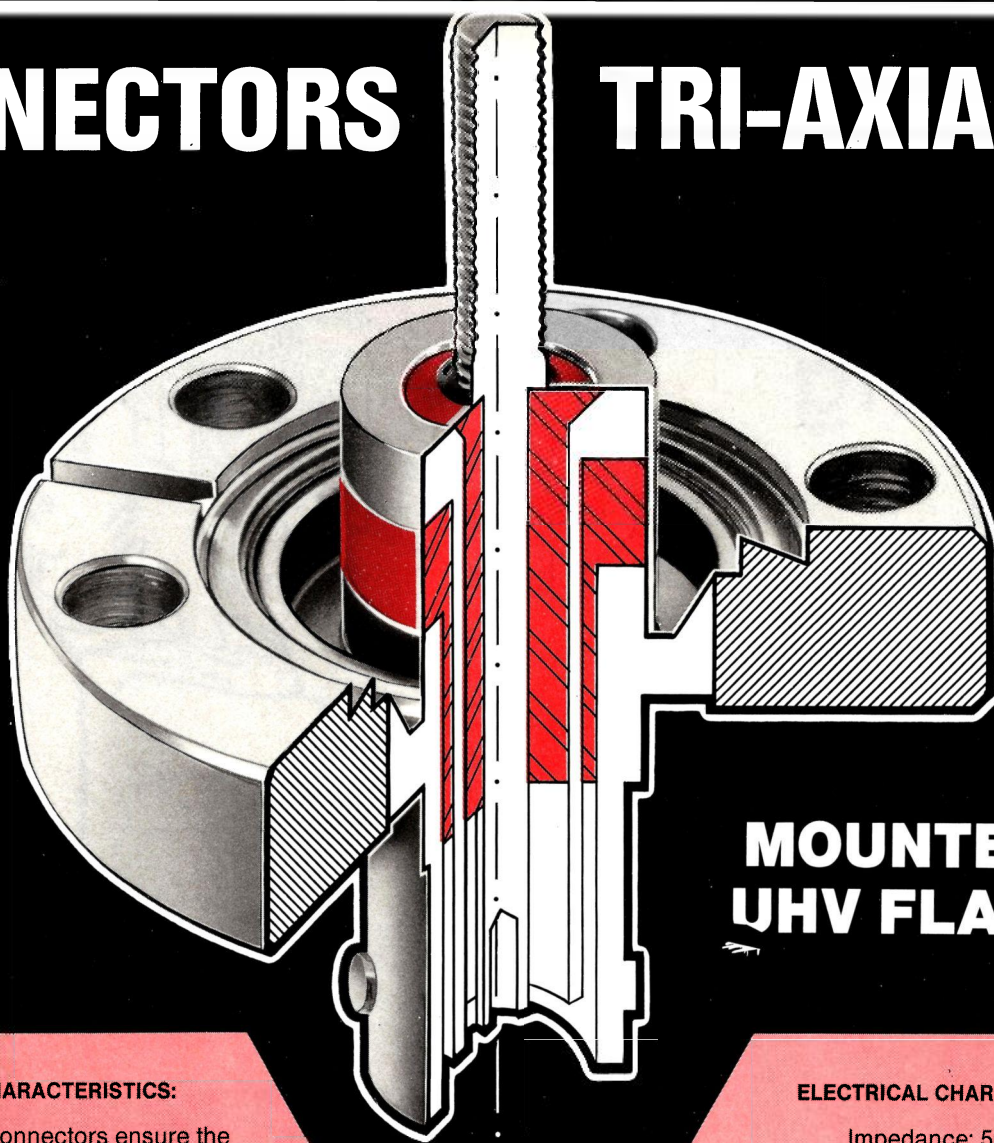


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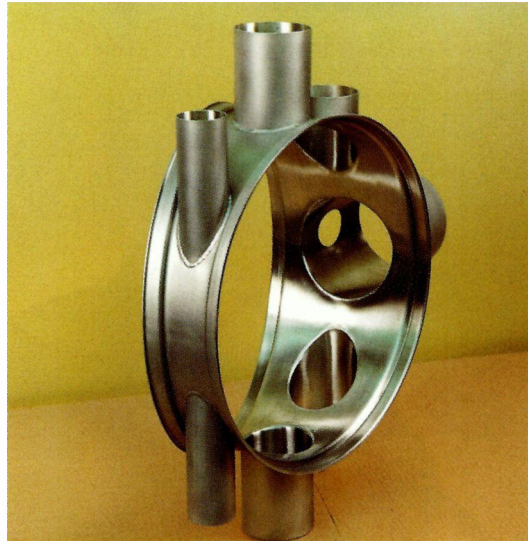
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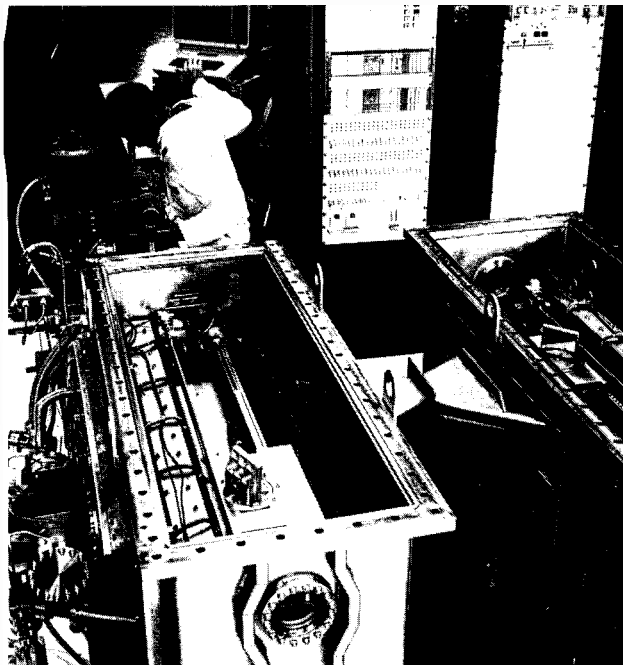
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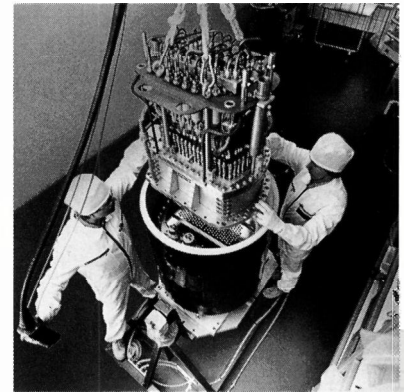
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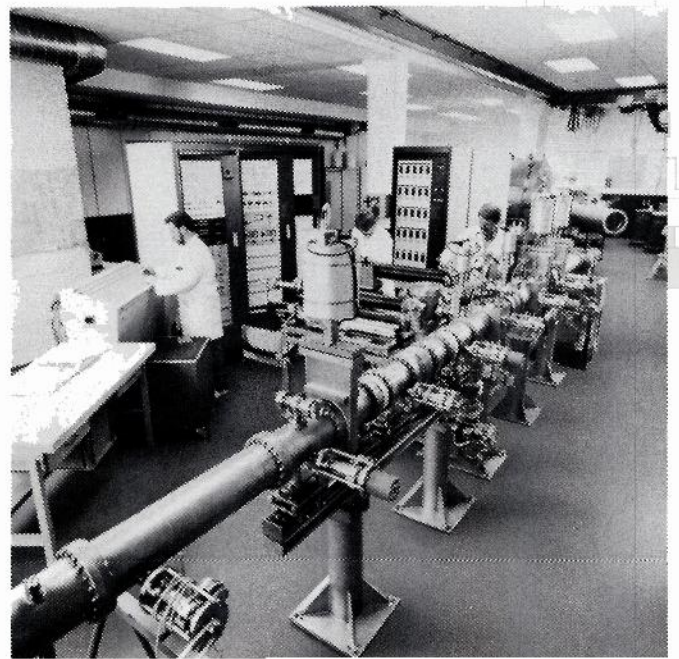
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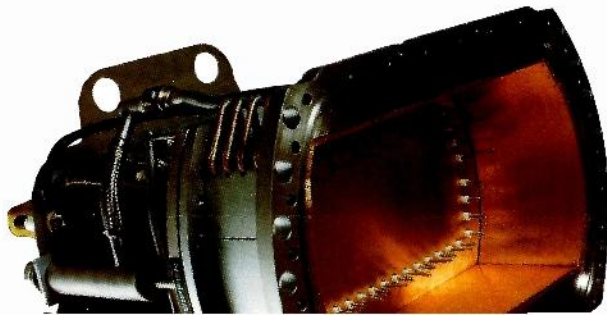


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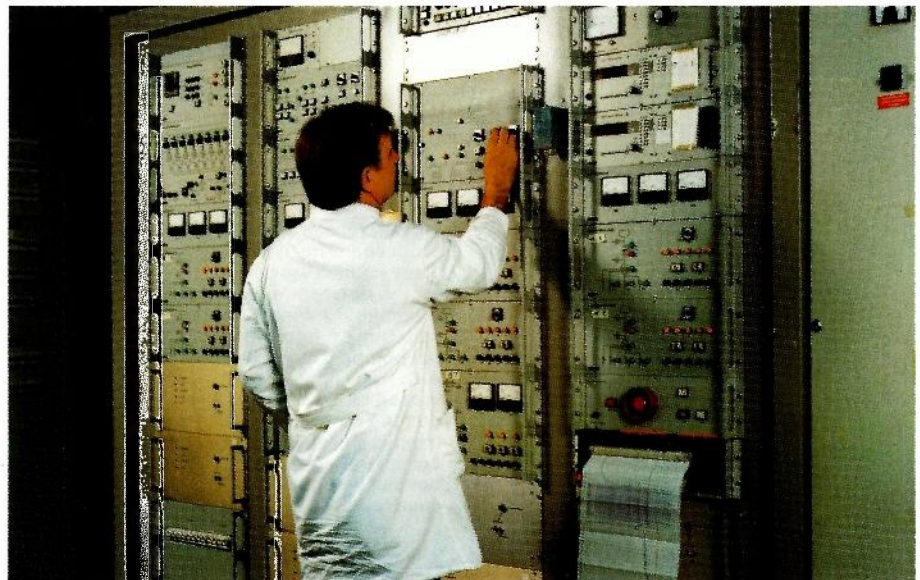
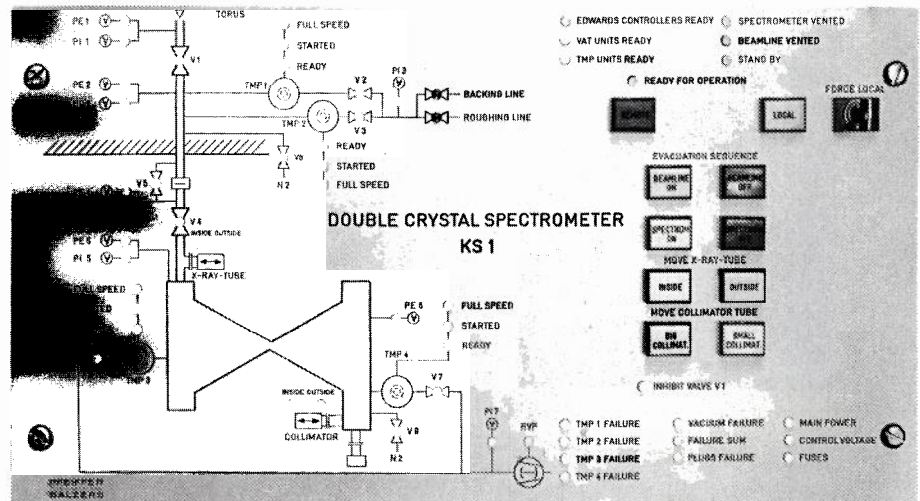
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Arthur Pfeiffer
Vakuumtechnik Wetzlar GmbH
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Process controls



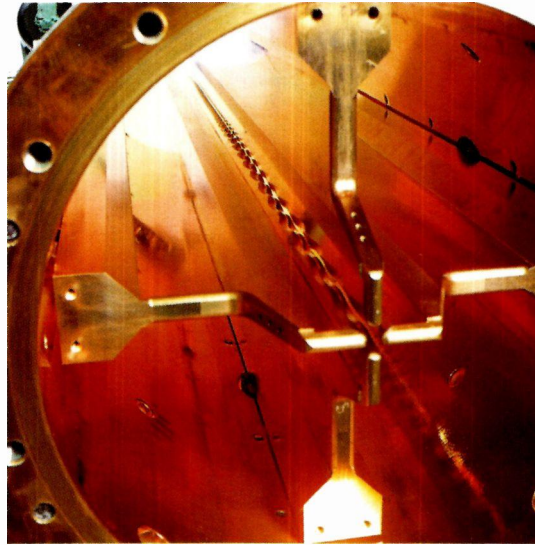
The combination of vacuum sequences with predefined process cycles is provided by programmable logic controllers (PLC). Controllers with integrated processors are used for complex control and positioning tasks, such as correcting the motion sequence of a crystal spectrometer with all necessary correction calculations and the interface to a main computer. These controllers represent intelligent subsystems which can be combined with other control systems via standard interfaces.



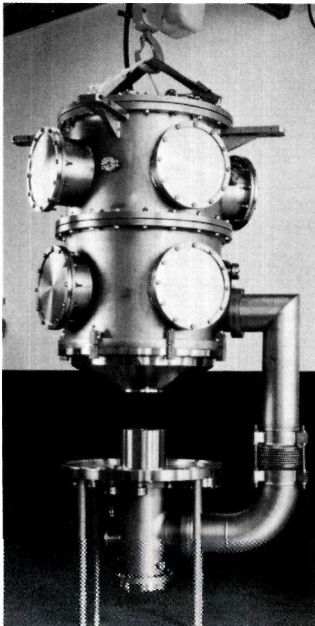
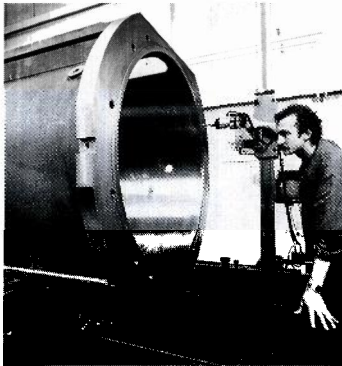
Accelerators and storage rings

- Cryostat systems for superconducting cavities
- RF quadrupole accelerators
- Alvarez structure as a linear accelerator for protons
- UHV dipole and quadrupole chambers for beam steering and beam diagnostics
- Electrostatic septum chambers
- Gas jet targets for scattering experiments

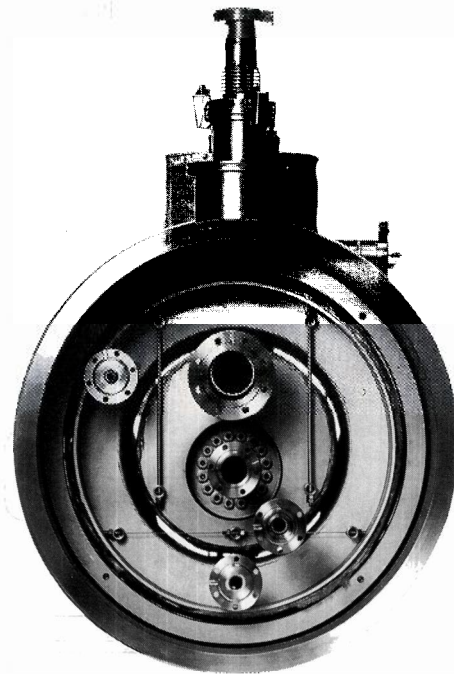
RFQ linear accelerator. The accelerator structure of this Radio Frequency Quadrupole consists of 4 vanes with wavelike pole tip design. These vanes are manufactured on CNC machines with an accuracy of ± 3 microns.



Dimensional inspection of an approx. 3,5m long module of an Alvarez structure on an X-Y-Z measuring machine. Ten of these modules form the three resonator tanks of the proton linear accelerator for HERA at DESY.



Gas jet target for the CELSIUS storage ring in Uppsala. A hydrogen cluster beam with a target thickness of up to 10^{14} atoms/cm² can be produced using a two stage cooling system for the nozzle and skimmer together with three differential pumping stages. A special cryo pump is used as the beam dump. The equipment is shown without scattering chamber and without vacuum pumps.



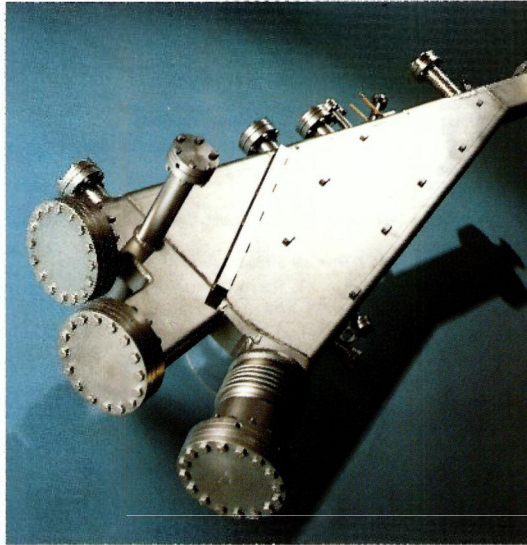
View into a 1,8 K cryostat for a superconducting electron-recyclotron accelerator. Superfluid helium is used for cooling. The heat dissipation of a cryostat module housing a 20-cell cavity resonator

is less than 3 watts. (The schematic diagram is shown in the background).

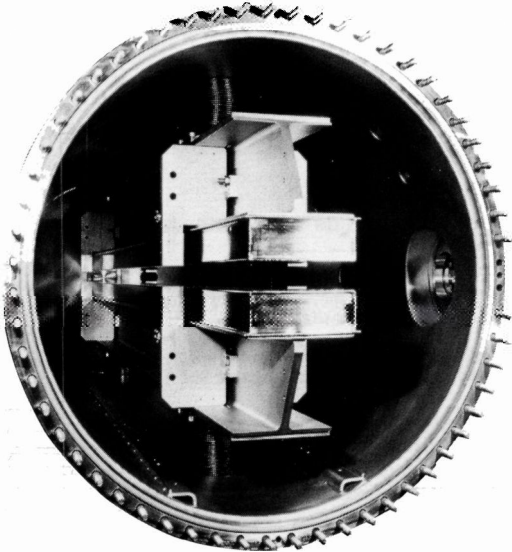
Synchrotron radiation

- Normal incidence monochromators with integrated grating change mechanisms
- Toroidal grating monochromators for different wavelength ranges
- Irradiation plant for X-ray lithography
- Wiggler/Undulator with encapsulated permanent magnets in ultrahigh vacuum

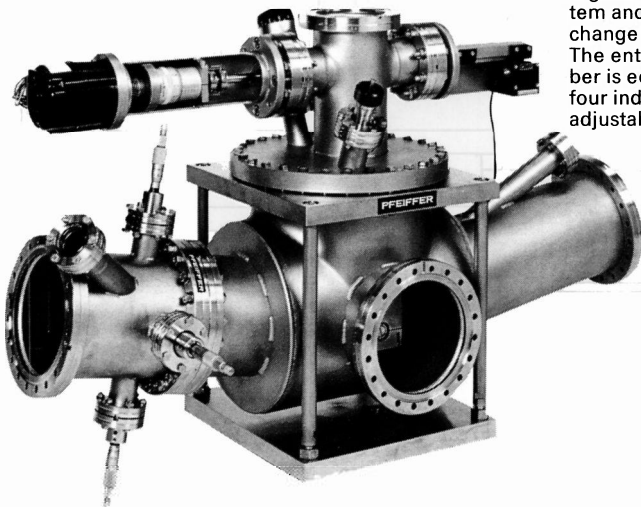
Dipole chamber for Synchrotron radiation at the BESSY I storage ring



Wigglers/Undulators are used on modern synchrotron radiation sources to increase the photon flux. Inherent is high precision, both of mechanics and of the control system, as well as UHV compatibility, which is needed for storage rings.

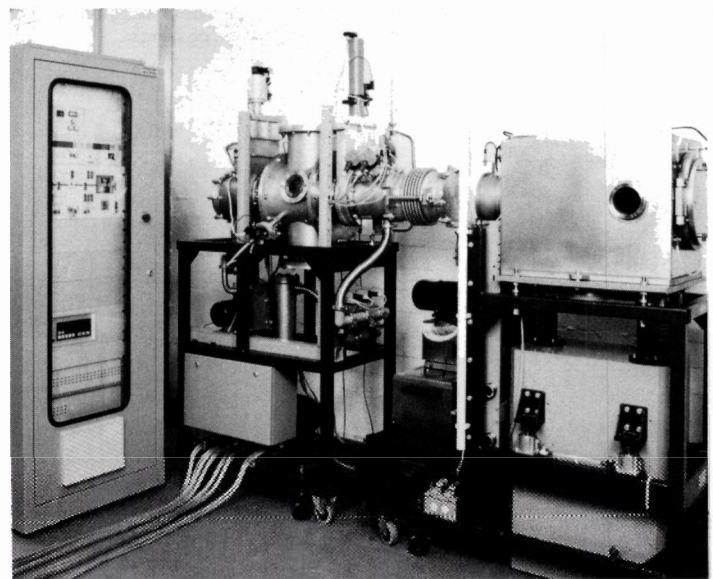


Toroidal grating monochromator with integrated drive system and grating change mechanism. The entrance chamber is equipped with four independently adjustable slit blades.



Irradiation plant for X-ray lithographic production of microstructures. In addition to mechanical accuracy, the required repositioning

accuracy of the mask is obtained by controlling the temperature inside the chamber to an accuracy of 0,1°C.



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