



Professorship in Experimental Condensed Matter Physics

A position as professor in experimental condensed matter physics at the Niels Bohr Institute for Astronomy, Physics and Geophysics (NBIAFG) will be open from September 1, 1994.

Most of the experimental condensed matter physics at the NBIAFG is located at the Orsted Laboratory in Copenhagen, while the cluster physics facilities are presently situated at the Niels Bohr Institute Tandem Accelerator Laboratory in Roskilde. The Orsted Laboratory has several small accelerators for ion implantation, X-ray diffraction facilities, a transmission electron microscope, and an MBE unit for III-V heterostructures with ancillary laboratories. In addition, it collaborates with the Center for Chaos and Turbulence Studies (CATS), located at the adjacent Niels Bohr Institute (also part of NBIAFG), on an experimental programme in non-linear physics.

The successful applicant is expected to conduct experimental research on the structures and excitations of condensed matter, and must have demonstrated the ability to do so in previous work. Particular emphasis will be placed on the applicant's potentiality for utilizing the large international facilities for condensed-matter studies to which scientists from Denmark have access. The chosen candidate will participate in the University teaching program at all levels and is expected to play a leading role in building graduate courses in experimental condensed-matter physics. The language of undergraduate instruction is Danish, but English will be accepted for the first two years of the appointment.

The application must include a *curriculum vitae* and a complete list of publications with a special indication of which publications are considered most relevant for this position. Information about teaching experience must also be enclosed.

The applicants' qualifications will be evaluated by a specially appointed Committee, and the entire report of the Evaluation Committee will be sent to all applicants. The Evaluation Committee may ask for supplementary material, which the applicant then must provide in the requested number of copies.

Information about research plans, facilities and staff may be obtained from the Director, Professor Ole Hansen, Niels Bohr Institute for Astronomy, Physics and Geophysics, Blegdamsvej 17, DK-2100 Copenhagen Ø, Denmark; telephone: +45 35 32 52 92, fax: +45 35 43 10 87, e-mail: oleh@nbi.dk. The professorship is a tenured position under the Ministry of Education. The annual salary is approximately 410,000 DKK after contributions to the pension scheme.

The application, marked "211-33/93-5207" and written in English, must formally be made to the Rector of the University of Copenhagen and mailed to the Faculty of Science, Blegdamsvej 3, DK-2200 Copenhagen N, Denmark. **Applications, in order to be considered, must have been received by the Faculty of Science no later than July 1, 1994.**

Three copies of the application, and in addition three copies of a brief outline of proposed research, should be mailed to the Director of the Niels Bohr Institute for Astronomy, Physics and Geophysics. No further material should be forwarded until requested.

The European Space Agency (ESA) is seeking a (m/f)



Scientist in Fundamental Physics

to work within the Space Science Department of the European Space Research and Technology Centre (ESTEC) located at Noordwijk (The Netherlands).

The Space Science Department (SSD) of ESA provides scientific support to ESA's scientific projects in their planning, development and operational phases, acts as an interlocutor between ESA and the scientific community, and also undertakes research programmes covering instrument development and data analysis using space-borne and ground-based facilities. The research activities in SSD are undertaken by scientific staff and ESA research fellows with the appropriate engineering, technical and administrative support.

The postholder will provide support for future space science projects in this area, such as STEP (Satellite Test of the Equivalence Principle) or LISA (Large Interferometer Space Antenna) for gravitational wave measurements at low frequencies. The emphasis of the post is on experimental techniques rather than on theory. The successful candidate should be familiar with ultralow drag-free control systems (proportional He thrusters or field-emission electric propulsion), with ultrahigh precision position sensing (using SQUIDS or electrostatic sensors), precise optical ranging systems and interferometry, and overall experiment error analysis, taking into account parasitic forces and spacecraft environment.

This post forms part of ESA's Advance Recruitment Programme which is established to provide appropriate staffing resources when programme requirements materialise. Appointments are therefore made for an initial duration of two years upon which the staff member may be appointed to a permanent post.

The candidate must have a PhD in physics or applied sciences and must be a national of one of the ESA Member States (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and United Kingdom) or Cooperative States (Canada). A good knowledge of English or French is required; some knowledge of the other language is desirable.

The conditions are those of an International Organisation, including expatriation and family allowances, and social security. Relocation expenses will be paid.

Please send a detailed *curriculum vitae* in English or French, quoting the following reference (ESA-VN-ESTEC-94-026), to the Head of Personnel at ESTEC, Keplerlaan 1, 2201 AZ Noordwijk ZH (The Netherlands), not later than **13 May 1994**. For inquiries, telephone +31-1719-833 08.

ITER Design Continues and JET Restarts

Representatives of the four Parties (Euratom, USA, Japan, and Russia) in the International Thermonuclear Experimental Reactor signed the second protocol of the ITER Engineering Design Activities (EDA) on 21 March 1994 in Vienna, which means that the EDA will continue for its full planned duration (until 20 July 1998). P.-H. Rebut, the ITER Director remarked that: "We shall now proceed with producing the detailed, complete and fully integrated machine design so that the Parties have access to all the technical data necessary to for future decisions on the construction of ITER". Speaking at the last July's 20th EPS plasma physics conference in Madrid, Rebut indicated that ITER's plasma major radius will be 8 m, with a 6 tesla field and operation at 3000-4000 MW (the equivalent parameters for the JET reactor in the UK, presently the world's largest tokamak, are: 2.5-3.4 m, 3.45 T, \approx 35 MW).

In general, Europe has been arguing for a conservative extrapolation of JET whereas the USA and Japan prefer a more speculative, high aspect machine. It is hoped that construction of ITER will start in 1998 so the decision on where to site it should be taken within about two years. Observers feel it is important for Europe's hopes that JET is kept alive (its three likely candidates are Cadarache in France, Studsvik in Sweden and Griefswald in Germany). A report issued at the end of March by a committee chaired by F. Troyon from the EPF Lausanne that considered Euratom activities after 1995 said a JET extension was "worthwhile", albeit at a reduced budget to keep it within the EC's 4th Framework programme so that approval would not entail complex European Union procedures. The idea is an extended programme on ITER-related research, with JET operating for three years after its statutory limit once the present programme to study

Summer University for Plasma Physics Max-Planck Institute for Plasma Physics 19-23 September 1994

Covering plasma physics with the emphasis on nuclear fusion.

For undergraduate students who have not yet started a PhD thesis.

Applications, with a high-school leaving certificate and evidence of basis physics study at university, should be sent by **31 May 1994** to Mrs. Ch. Stahlberg, MPI für Plasmaphysik, Boltzmannstr. 2, D-85748 Garching bei München (tel.: +49-89-32 99 22 32).

Cross-Over Phenomena in Solid-State Physics - From Weak to Strong Coupling in Electronic Systems Turin, Italy 3-8 October 1994

EUROCONFERENCE

Contact: Inst. for Scientific Exchange, Villa Gualino, Viale Vittorio Severo, 65, I-10133 Turin; tel./fax: +39-11-660 30 90 / 660 00 49

pumped divertors for impurity control [*EN 23* (1992) 123] ends in 1996. The reduced budget would mean a reduced staff and no major investment. The JET Council will probably decide at its October meeting on the presentation of a formal proposal.

JET restarted its plasma in mid-March, essentially on schedule, after a 2-year shutdown to install a divertor. Commissioning continues as the plasma current is raised from 1.5-2.0 MA to about 3 MA (a milestone would be 2 MA with 10 MW of heating and the target is 5-6 MA after installation of a water-cooled divertor next year). Identifying a source of internal arcing entailed a temporary shutdown and there will be another shutdown in June to install equipment. The full experimental campaign will therefore probably begin after August, although JET hopes there will be first physics results for this summer's conferences, including the 21st EPS plasma physics conference (Montpellier, 27 June – 1 July, 1994). Meanwhile, the long-running dispute between the European Commission and the JET Team's British staff belonging to the UK Atomic Energy Authority entered a new phase following an agreement negotiated by the European Parliament's budget committee, that had withheld 59 MECU of the 1994 fusion budget until a solution was found to what the UK staff see as unfair salaries. Subject to formal approval by Parliament, some 2 MECU is made available to the 235 UK staff as a one-time compensation based on length of service (there are also some additional posts) provided their petition is withdrawn. The association that represents the staff is currently seeking advice on legal action.

● NSF-Style UK Research Councils

The UK's disbanded Science and Engineering Research Council ceased to exist on 31 March 1994 when its activities were taken over by one of four Councils, three of which came into being on 1 April, notably the Engineering and Physical Sciences Research Council (EPSRC) and the Particle Physics and Astronomy Research Council (PPARC). The SERC's Rutherford Appleton Laboratory and Daresbury Laboratory will be administered jointly by EPSRC. There has been some speculation that the Director-General of the Research

1994 HEWLETT-PACKARD EUROPHYSICS PRIZE



The winners of the 1994 Hewlett-Packard Europhysics Prize (for discovering C_{60}) received the award at the 14th General Conference of the Condensed Matter Division (Madrid, 28-31 March 1994). From the left, Richard Smalley, Wolfgang Krätschmer, Donald Huffman, and Harold Kroto.

Councils aims to move towards a management-oriented system similar to that used by the US National Science Foundation to approve research funding. There would be programme managers who seek independent reviews in place of advisory committees with their committee secretaries. The academic and research communities are naturally worried that their influence will be reduced. Whatever materialises, the present committee system will remain for the rest of the academic year.

MOBILITY SCHEME

Independence and Maths are the Differences

Student independence and the maths background reflect the main differences between learning physics in Germany and Portugal, according to Sonia Autunes from Lisbon's Instituto Superior Técnico who is presently spending her 3rd year in the Physics Department, Hannover University, on an exchange arranged by the EPS's European Mobility Scheme for Physics Students (EMSPS). The 30 students now taking her 5-year technical and engineering physics course must wait until the 3rd year before learning the maths that German students in physics study in their 1st year. So compared with her fellow students, Sonia is at a disadvantage when it comes to mathematical skills, and she thinks it might have been better if she had moved in her 4th year. The problem, is that

students in Portugal choose their speciality in the 4th year (later than in Germany) and she feels she cannot be away the year this is done.

The independence of German students is reflected by a certain maturity which strikes her: fellow students in Hannover are significantly older – an average age of 23 whereas Sonia is only 20 – and they tend to have jobs – virtually unheard of in Portugal. In Hannover, extensive tutoring is rare, independent and group study more widespread, and class sizes much larger (2- to 6-times those in Lisbon). However, facilities are definitely better: a students' residence is available, but being used to living alone she says it would be difficult to stay there for more than a year; one can even take books from the library and the cafeteria is remarkably good – for a cafeteria.

As with all mobility students, she is aiming to take courses in Hannover that are equivalent to those in Lisbon. Sonia acknowledges that only the mobility scheme's Coordinators in the host and home universities can ensure the correct overlap, given that Portuguese students tend to follow a strict programme whereas those in Germany have much more flexibility. Hannover's first two courses in quantum mechanics are roughly equivalent to Lisbon's intermediate course, and her solid state physics course has a reasonable overlap. The main difference is that she can select special topics (e.g., optical bistability) which are not available in Portugal. Her work load is about the same as back home, with

practicals (spread over three days instead of one as facilities are better) and 20 hours per week of lectures.

Sonia's main concern – as for most mobility students spending a year away from their home university – concerns evaluation. In Germany, there are weekly papers and periodic course exams throughout the year, with a final diploma exam covering all courses. In Portugal, however, one takes exams in each course at the end of the year and things are very structured with 160 examination marks in each of the first three years. She is naturally curious to know how her results in Hannover will be graded, especially as she would also like to see some weight attached to the fact that she has taken the courses in Germany. Professor Peter Sauer, her Coordinator in Hannover, indicated that he will set special exams if necessary, in collaboration with Professor Jorge Romão, her Coordinator at the Instituto Superior. This illustrates the great advantage of the mobility scheme, which recognizes that Coordinators must ensure that students are graded on courses followed elsewhere, and that these grades are credited in full back home.

Whatever the outcome, Sonia does not regret her year in Hannover; she wants to do research in Germany one day, so practicing German is a definite plus (German courses are included in her programme). Sonia, whose full name is Sonia Alexandra Ferreira de Magalhaes Autunes, feels there was nothing exceptional about her learning German and English at her lycée in Vaina do Castelo, although she admits that having a gift for languages and a desire to eventually become a physicist able to work internationally were strong encouragements.

Sonia Autunes, on the left, with Professor Peter Sauer, her EMSPS Coordinator.

