

tronomy, naturally strongly dependent on the availability of lecturers (local and visiting). An example of such a list includes Astrometry, Cosmology, Extragalactic Astronomy, Formation and Evolution of Stars and Stellar Structure. Some of these courses are fully delivered (or include units of 10 to 15 hours) by visiting professors or researchers; this has proven to be very stimulating, exposing the students to different people and also helping to compensate for the lack of "people around", considering that the number of astronomers in Portugal is presently so reduced – well below the European average of 1 to 2 astronomers per 100,000 inhabitants;

– at a younger level: taking Astronomy to the Schools through a programme involving the Centro, the Regional Education Authority and the Government Local Authority; this includes sessions with a portable planetarium „Starlab“ donated to the Centro by the Government Local Authority (the planetarium sessions are prepared for age groups 5–7, 8–10 and 10–12), talks on various topics of Astronomy and the preparation of slide sets with explicative texts to be lent to teachers at various levels.

The Centro has also been involved in the planning of the Master's degrees for students connected with it; several students from the Centro have successfully completed their degrees at various Astronomy departments with the following thesis:

- "The Solar-Stellar Connection", University of Sussex (1989),
- "Evolution des Etoiles Bleues et Lumineuses aux Environs de la Limite de Humphreys-Davidson", Universités Paris VII et Paris XI (1989),
- "IRIS – A Project on Infrared Image Sharpening", University of Edinburgh (1989),
- "La Fonction de Luminosité des Nébuleuses Planétaires", Universités Paris VII et Paris XI (1990),
- "L³He dans le Soleil, Étude Analytique de la Diffusion Microscopique", Universités Paris VII et Paris XI (1990),
- one thesis to be completed soon, Queen Mary and Westfield College – University of London (1990).

The University of Porto is also the national node for the European Astrophysics Doctoral Network, a consortium which today federates 21 European Universities all having a graduate programme in Astrophysics, ESA and ESO. This Network has continuously benefited from national, European Community (ERASMUS) and European Science Foundation support.

2. The Centro is the institutional structure providing support for the development of research projects, adequate

postgraduate education, undergraduate education, the promotion of Astronomy (through the organization of conferences, courses, etc.) and the stimulation of science popularization.

The ongoing research projects at the Centro are in the following areas:

- (a) – "Classification of Observed Astrophysical Structures"
- (b) – "Cosmology – Jordan-Thiry theories and models of galactic formation",
- (c) – "Stellar Astrophysics".

These areas have been selected because they were already active research areas at the University of Porto and all have research projects where Ph.D. work is carried on, namely:

- (a) – "Classification of Observed Astrophysical Structures" – the quantitative analysis and application of statistical methods to the study of large structure and their origins, a collaborative project with people at ESO and the ST-ECF involving one Ph.D. student,
- (b) – "Cosmology" – the study of dark matter in the Universe, involving one Ph.D. student at the Centro,
- (c) – "Stellar Astrophysics"

– the modelling of winds in young stars, a collaborative project with people at the University of Sussex involving one Ph.D. student at the Centro (1990),

– the study of the evolution of pre-main-sequence stars, a collaborative project with people from the Astrofysisch Instituut, Vrije Universiteit Brussel, involving one Ph.D. student (1989),

– the study of MHD outflows from astrophysical objects, a collaborative project with people from the Department of Mathematical and Computational Sciences, University of St. Andrews (1989),

– the study of the interaction between young stars and molecular clouds, involving one Ph.D. student from the Centro at the Department of Astronomy of the University of Edinburgh (1989),

– two other Ph.D. students are expected to start in October Ph.D. projects within Stellar Astrophysics.

We are also working in order to try to guarantee that at a more advanced stage temporary post-doctoral positions (2- to 3-year contracts) are available not only at the Centro but also at other national Institutions. Furthermore, we are also trying to draw attention to the fact that if all this effort is to be fully explored it should involve a real commitment by the universities and national research authorities towards the opening of permanent positions in Astronomy at the various Institutions.

3. The Centro provides the local infrastructure to support research, through

3.1 – library facilities (a collection of back numbers of the most relevant journals was generously offered by some Institutions such as ESA, ESO, Utrecht Laboratory for Space Research, Observatoire de Meudon, Royal Greenwich Observatory and astronomers working there),

3.2 – computer facilities for data analysis, access to networks, data banks, data bases and larger computers existing in the country, as well as adequate software; the Centro is equipped with a μ Vax 3400, 700 MB in disk TK 70 and accessories such as graphic terminals, printer, Image Display device and adequate software is also available (Starlink, Nag, Matlab and MIDAS being installed); some Mackintosh are also available.

4. Observing facilities – the availability of observing facilities, either national or on a collaborative basis with international observatories, for the Portuguese astronomers and post-graduate students is vital; besides the existence of potentially very good sites on the national territory, such as Madeira, and the possibility of building a national observatory being very attractive and not to be excluded in the long run, the alternative of the participation in existing international facilities seemed to be more advantageous. People from the Centro were deeply involved in all the negotiations process that successfully ended in the present agreement with ESO.

5. Promotion of the popularization of Astronomy – the Centro has had various initiatives during the current year, namely through activities such as

– the local organization of the ESO exhibition in Porto (October 1990) including organized visits for students in the terminal years of Secondary Schools,

– the organization of a series of public conferences on several topics of Astronomy simultaneously with the ESO exhibition,

– various popular-level talks on Astronomy.

Most of these activities also involve the Astronomy students.

New ESO Scientific Preprints

(June–August 1990)

- 705. E. Gosset et al.: A Search for Quasars in a Field Around NGC 520. *M. N. R. A. S.*
- 706. P. Magain and G. Zhao: Empirical Study of Departures from the Excitation

Equilibrium of Fe I in Metal-Poor Stars. *Astrophysical Journal*.

707. D. Hutsemékers and J. Surdej: Formation of P Cygni Line Profiles in Relativistically Expanding Atmospheres. *Astrophysical Journal*.
708. T. Baribaud and D. Alloin: On the Use of [O III] Narrow Line Emission for Scaling Spectrophotometric Data in Active Galactic Nuclei. *Astronomy and Astrophysics*.
709. A. M. Lagrange-Henri et al.: Search for Beta Pictoris-Like Stars. *Astronomy and Astrophysics, Suppl.*
710. L. B. Lucy, I. J. Danziger and C. Gouiffes: Excitation by Line Coincidence in the Spectrum of SN 1987A. *Astronomy and Astrophysics*.
711. J. S. Chen, X.-W. Liu and M.-Z. Wei: CCD Photometry of Unclassified Cataclysmic Variable SS UMi (PG 1551+719). *Astronomy and Astrophysics*.
712. D. Baade, W. Schmutz and M. van Kerkwijk: Short-Term Activity in the γ^2 Velorum System: The O-Type Supergiant is a Nonradially Pulsating Star. *Astronomy and Astrophysics*.
713. A. F. M. Moorwood and E. Oliva: H₂ Emission in Galaxies: Observational Constraints on Ultraviolet Excitation. *Astronomy and Astrophysics*.
A. F. M. Moorwood and L. Origlia: IR Images of the Circinus Galaxy and NGC 4945. To appear in Proceedings of the NOAO/KPNO Conference on Astrophysics with Infrared Arrays.
714. E. Oliva, A. F. M. Moorwood and I. J. Danziger: Infrared Spectroscopy of Supernova Remnants. II. A Detailed Study of RCW 103. *Astronomy and Astrophysics*.
715. Proceedings of the ESO-CERN Topical Workshop on "LEP and the Universe". April 5 and 6, 1990. CERN, Geneva, Switzerland. Organized by J. Ellis, P. Salati and P. Shaver.
716. D. Hutsemékers and E. van Drom: The Supergiant Bep Star CD -42°11721 and Its Surrounding Nebula. *Astronomy and Astrophysics*.
717. W. W. Zeilinger et al.: NGC 5084: A Massive Disc Galaxy with a Tilted Ring. *M. N. R. A. S.*
718. G. Zhao and P. Magain: The Chemical Composition of the Extreme Halo Stars. III. Equivalent Widths of 20 Dwarfs. *Astronomy and Astrophysics Suppl.*
719. A. F. M. Moorwood: Infrared Capabilities of Very Large Groundbased Telescopes. Invited paper presented at the COSPAR XXVIII Symposium "The Infrared and Submillimeter Universe at High Redshifts". To be published in *Advances in Space Research* (Pergamon, Oxford).
720. P. Crane et al.: The Interstellar ¹²C/¹³C Ratio Toward μ Normae. *Astrophysical Journal*.
721. M. Mariani and S. A. Bonometto: Thermal Evolution of Phases During the Cosmological Quark-Hadron Transition. *Astrophysical Journal*.
722. A. Sandage and G. A. Tammann: Steps Toward the Hubble Constant IX: The

ESO FELLOWSHIPS 1991-1992

The European Southern Observatory (ESO) intends to award up to six post-doctoral fellowships tenable in the ESO Headquarters, located in Garching near Munich.

The main areas of activity are:

- to do research in observational and theoretical astrophysics;
- to carry out a programme of development of instrumentation for the La Silla telescopes;
- to develop future telescopes involving new technology;
- to provide data reduction facilities for users of the ESO instruments;
- to provide photographic facilities for atlases of the southern sky;
- to foster cooperation in astronomy and astrophysics in Europe.

Fellows normally participate in one or more of the above. In addition there is the possibility of participating in the activities of the European Coordinating Facility of the Space Telescope (ST-ECF) which has been established at ESO.

Fellows will normally be required to spend up to 25% of their time in supporting activities such as the introduction of users to data reduction facilities, remote control operations and testing new instrumentation.

Fellowships are to be taken up between January and October 1991.

Most of the scientists in the Centre come from the member States of ESO, but several are from other countries. The Member States of ESO are: Belgium, Denmark, the Federal Republic of Germany, France, Italy, the Netherlands, Sweden, and Switzerland. In addition to regular staff members, the Centre comprises visiting scientists, post-doctoral fellows, and graduate students.

ESO facilities include the La Silla Observatory in Chile with its eight telescopes in the range 0.9 to 3.6 m, as well as a 1-m Schmidt, the 15-m SEST and smaller instruments. In Garching, extensive measuring, image processing and computing facilities are available.

Applicants normally should have a doctorate awarded in recent years. The fellowships are granted for one year, with normally a renewal for a second year and occasionally a third year. Applications should be submitted to ESO not later than October 15, 1990. Applicants will be notified in December 1990. The ESO Fellowship Application form should be used. Three letters of recommendation from persons familiar with the scientific work of the applicant should be sent to ESO directly. These letters should reach ESO not later than October 15, 1990.

Enquiries, requests for application forms and applications should be addressed to:

European Southern Observatory
Fellowship Programme
Karl-Schwarzschild-Str. 2
D-8046 GARCHING b. München
Federal Republic of Germany

Cosmic Value of H₀ Freed from All Local Velocity Anomalies. *Astrophysical Journal*.

723. P. A. Shaver: Active Galactic Nuclei in Cosmology (A review of literature published from July 1987 to June 1990, for

1991 IAU Transactions XXIA, Commission 47).

724. P. Molaro and P. Bonifacio: Chemical Abundances of Two New Extreme Metal Poor Giants. *Astronomy and Astrophysics, Letters*.

Visiting Astronomers

(October 1, 1990-April 1, 1991)

Observing time has now been allocated for Period 46 (October 1, 1990-April 1, 1991). As usual, the demand for telescope time was much greater than the time actually available.

The following list gives the names of the visiting astronomers, by telescope and in chronological order. The complete list, with dates, equipment and programme titles, is available from ESO-Garching.

3.6-m Telescope

Oct. 1990: Danziger/Bouchet/Lucy/Fransson/Mazzali/Della Valle/Gouiffes, Gratton/

Snedden, Moehler/de Boer, Mazure et al. - 1-014-43K, Danziger/Bouchet/Lucy/Fransson/Mazzali/Della Valle/Gouiffes, Turatto et al. - 4-004-45K, de Lapparent et al. - 1-003-43K, Shaver, Macchetto/Turnshek, Danziger/Bouchet/Lucy/Fransson/Mazzali/Della Valle/Gouiffes, Turatto et al. - 4-004-45K.

Nov. 1990: Mariotti/Cuby/Lacombe/Léna/Merkle/Perrier/Rigaut, Gallais/Alloin/Rouan/Lançon/Léna/Rigaut/Merkle, Combes M./Léna/Rigaut/Merkle/Cuby/Tomasko/Saint-Pé, Ögelman/Gouiffes/Melnick/Augusteijn/Hasinger/Pietsch/Pedersen, Ögelman/Gouiffes, Danziger/Bouchet/Lucy/Fransson/