

OBSERVATÓRIO ASTRONÓMICO
PROF. MANUEL DE BARROS
UNIVERSIDADE DO PORTO

MONTE DA VIRGEM
4400 VILA NOVA DE GAIA
PORTUGAL

enclosures not typed

REPORT ON THE XV IAU - UNESCO
INTERNATIONAL SCHOOL FOR YOUNG ASTRONOMERS

The XV IAU - UNESCO International School for Young Astronomers was held in Espinho - Portugal, from September 15 to 27, 1986.

The School was announced in IAU Bulletin well in advance. Moreover, individual contacts with institutions in mediterranean and most of other african countries and their embassies in Lisbon were made to publicize the School as much as possible (see Enclosure A).

Also, the presence of the Director of the School in the International Symposium, "Geodesy in Africa", held in Yamoussoukro, Ivory Coast, April 1986, has been used for that purpose, as he contacted personally representatives of several african countries. As a result of all those efforts, there was such a large number of applications that we could accept only part of them.

The Program of the School was printed in advance and distributed to all the participants at their arrival (see Enclosure B). The Addendum to this Program is Enclosure C.

The lectures were conducted in English. The list of lecturers, Time Table of the lectures and their summaries are given in the Program.

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Students from abroad:

- Angola -----	2
- Czechoslovakia -----	2
- Greece -----	2
- Guinea -----	1
- Spain -----	12
- Turkey -----	1

Students from Portugal

- Coimbra -----	2
- Lisboa -----	5
- Porto -----	3

Total number of students ----- 30

For their addresses see the Program.

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(Not to be used)

All of the School's activities proceeded smoothly according to the Time - Table and Additional Program (Enclosures B and C). A great part of lecture notes were xerox - duplicated and distributed to all the students. Therefore, they could concentrate more on the lectures themselves than on writing notes. This was made possible due to the excellent work of the Secretariat, consisting of two Observatory members

Isabel Maria Couto - Assistant Faculty of Sciences

Ana Leite da Cunha - Technical Assistant of the Observatory

under the guidance of the Director of the School.

All the participants were accomodated, took their meals and followed the lectures in the same building. This was possible due to the excellent help given by the Administration of Solverde.

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Assessment of the XV School in Portugal

Besides the basic aim of the School - namely the transfer of knowledge and experience to the younger generation of astronomers - the Portuguese School has also proved to be useful in some other respects:

- Because everyone stayed together, lecturers and students, the young astronomers were able to get advice from and discuss their scientific problems in full with the lecturers, seeking orientation for their future scientific research, mainly with respect to their Ph. D. Thesis;

- Since a part of the School activity was devoted to seminars, all the participants became acquainted with the scientific work of each one as well as with the research and modern astronomical equipment of their Institutes;

- The excellent human atmosphere during all the School will, without doubt, contribute to the future international cooperation in the field of Astronomy;

- The high scientific level of most of the movies projected during the lectures or in the evening, after the lectures (See Enclosure C), was a great contribution for the School;

- The great interest put by the students in all the activities and, in particular, the high level of their Seminars were characteristic features of the Portuguese School;

- Visits to places of historical importance (in Porto, Coimbra and Conimbriga) and the folklore festivals in Espinho were an important contribution to the participants cultural education.

PORTO, 1986 September 30

Enclosures:

- A. Poster announcing the School
- B. Program
- C. Program - Addendum
- D. Financial Report


J. Kleczek

Secretary


J. Osório
Director

Financial Report

1. Lodging of all the participants	US\$4,242
2. Board of all the participants	4,160
3. Traffic	571
4. Academic activities and administrative affairs	1,315
	<hr/>
Total	US\$10,288

School Resoures

1. IAU	US\$4,035
2. Local	6,253
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Total	US\$10,288

The travel expenses for the lecturers, in total US\$3,465, have been paid directly by the IAU Secretariat.

The use of conference room and facilities, receptions, closing dinner and coffee were free of charge, as a kind assistance of the Administration of Solverde.

P R O G R A M - Addendum

Monday, 15

19 h = SLIDES

Giotto program to HALLEY's Comet (with explanation by Prof. H. Schmidt).

Tuesday, 16

19 h - FILM

"The Universe", film produced by NASA.

Wednesday, 17

19 h - FILMS

Two films of the "Open University" (B.B.C.), from the Series "Matter in the Universe", with the comments and explanations by Dr. B. Sommerville.

Thursday, 18

21.30 h = Public conference by Prof. J. Kleczek, "The Sun and Life", with projection of the movie "Our Sun in Action"

Friday, 19

19 h - Two other films from the Series "Matter in the Universe",
commented again by Dr. E. Sommerville.

Saturday, 20

11 h - Visit to Porto Wine Cellars in Porto

15 h - Trip by boat on the river Douro and visit to historical
monuments in Porto.

Sunday, 21

8.30 h - All day trip to Coimbra University and the remain ruins
of Conimbriga.

Monday, 22

17 h - SEMINARS

1 - JORDI CEPA NOGUE - Multiband Bidimensional Photometry
of Nearby Spiral Galaxies

2 - JUAN ANTONIO BELMONTE AVILLES - Stellar Seismology

After Seminars - Film "COSMOS", Carl Sagan.

Tuesday, 23

17 h - SEMINARS

1 - MARGARET METAXA - Density profiles of star clusters

2 - XIRADAKI EVANGELIA - Spectral classification of the
LMC clusters

3 - ALCS KUCERA - Investigation of solar faculi

4 - LADISLAV HRIC - Binary peculiar star omega UMa:
retrospect and prospect.

After Seminars - Three Films of the "Open University" (B.B.C.),
from the Series "Matter in the Universe", with
comments by Dr. B. Sommerville.

Wednesday, 24

17 h = SEMINARS

1 - MINIA MANTEIGA OUTEIRO - Blue Stragglers, overview
and binary frequency

2 - MANUEL HERNANDEZ - Absolute photometry: Multinight
method

3 - ALFONSO ARAGON - Spectral synthesis in early type
Galaxies

4 - JORDI CEPA and JUAN ANTONIO BELMONTE - Astrophysical
Observatories of CANARIAS.

After Seminars = Three Nasa Films on "PLANETS", with comments by
Prof. Z. Kopal.

Thursday, 25

17 h = SEMINARS

1 - ANGELS RIERA MORA - Implosion of shock waves in White
Dwarfs

2 - FRANCISCO-JOSE BARREIRO - RS Canum Venaticorum binary
systems

3 - JAVIER ARMENTIA - Ethimology of the basque names of
the Heavens

4 - SERDAR EVREN - The Observatories in TURKEY

5 - MANUEL NUNES MARQUES - The Astronomical Observatory
of LISBOA

6 - ILIDIO SIMOES - The Astronomical Observatory of
COIMBRA.

21.30 h - Public Conference "Visit by Spacecraft of Outer Solar
System", by Z. Kopal, with movies on Planets.



XV IAU — UNESCO INTERNACIONAL SCHOOL FOR YOUNG ASTRONOMERS

Espinho — PORTUGAL

September 15,27 1986

PROGRAM

**SECÇÃO PORTUGUESA DAS UNIÕES INTERNACIONAIS
ASTRONOMICA E GEODESICA E GEOFISICA
(S. P. U. I. A. G. G.)**

XV IAU - UNESCO INTERNATIONAL SCHOOL FOR YOUNG ASTRONOMERS

Organized by the Portuguese National Committee on Astronomy -
"Secção Portuguesa das Uniões Internacionais Astronómica e
Geodésica e Geofísica" (S.P.U.I.A.G.G.)

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Supported by

- International Astronomical Union
- UNESCO
- SPUIAGG
- Solverde

Other supports

- Universidade do Porto
- Universidade de Coimbra
- Observat6rio Astron6mico "Prof. Manuel de Barros"
- Centro de Astronomia da Universidade do Porto
- C6mara Municipal de Espinho
- Alian7a Seguradora

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PORTUGAL

TIME TABLE

Day	9 / 10½	11 / 12½	15 / 16½	17 / 18½
15	= Registration =		Lunch	= Opening =
16	J.K. Break	H.S.	"	J.M. Break B.S.
17	J.K. "	H.S.	"	J.M. " B.S.
18	J.K. "	H.S.	"	J.M. " B.S.
19	J.K. "	H.S.	"	J.M. " B.S.
20	H.S. = Excursion =		"	= Excursion =
21		= Excursion =		
22	B.S. Break	Z.K.	Lunch	Z.K. Break Sem.
23	B.S. "	Z.K.	"	Z.K. " Sem.
24	J.K. "	Z.K.	"	B.S. " Sem.
25	J.K. "	Z.K.	"	Z.K. " Sem.
26	J.K. "	J.O.	"	= Closing =
27	= Departure =			

= SUMMARIES =

STRUCTURE OF THE UNIVERSE (Dr. J. Kleczek)

1. Systems. Elementary particles. Their interactions. Properties of matter as a function of temperature and density.
2. Structural hierarch (from quarks and leptons to supergalaxies) as a natural consequence of particle interactions.

EVOLUTION OF THE UNIVERSE (Dr. J. Kleczek)

1. Superparticles. Quarks and leptons. Gluons, w-bosons, photons, gravitons. Superunified force. Grand unified force. Unified force. Electromagnetic and weak force. Big-bang. Cooling of Universe. Statistical equilibrium of elementary particles. Hadron era. Lepton era. Gravitation.
2. Radiation era. Stellar era. Formation of galaxies. Life of stars. Nucleosynthesis. Future evolution. Evolution of systems and increase of orderliness.
3. Negentropy and information.
4. Matter-antimatter cosmology. Closed and finite Universe.

Bibliography

J. Kleczek: The Universe, Reidel Dordrecht, 1976

F. Hoyle, J. Narlikar: The Physics-Astronomy Frontier, Freeman and Co., San Francisco, 1980

EVOLUTION OF THE SUN (Dr. J. Kleczek)

1. The Sun today.
Solar quantities. The Sun as a system of elementary particles.
Thermodynamics of the Sun.
2. The ancient Sun.
Sources of information. Protosolar nebula. Evolution to main
sequence star. Evolution on the main sequence. Chemical aging
and slowing down of solar rotation. History of solar
luminosity. Variations of solar activity.
3. Future Sun.
Post-main sequence evolution. Contracting helium core.
Sequence of thermonuclear reactions in aging Sun. White
dwarf and a planetary.

Bibliography

R. O. Pepin, J. A. Eddy, R. B. Menill: The Ancient Sun,
Pergamon Press, 1980

R. L. Bowers, T. Deeming: Astrophysics, Jones and Bartlett
Publishers, Inc., Boston, 1984

COSMIC ELECTRODYNAMICS (Dr. H. M. Schmidt)

1. Single particles in a magnetic field.
Related phenomena: Van Allen-Belt, crab nebula, ampte: artificial comet.
2. Frozen-in fieldlines.
Related phenomena: prominences, magnetic fields of neutron, star, galatic center.
3. Magnetohydrostatic equilibria.
Related phenomena: prominences, sunspots, other magnetopauses.
4. The dynamo problem.
Related phenomena: expulsion of magnetic flux by convection in a resistive medium, Cowling's theorem, Alpha-Omega-Dynamos, Biermann's battery.
5. Dynamos with Lorentz-Forces.
Related phenomena: solar dynamo, comets in the solar wind, double radio sources, S9433.
6. Waves in a plasma.
Related phenomena: penumbral waves, coronal waves, shock waves faraday rotation and pulsar drifts in the interstellar medium.
7. Instabilities in a plasma.
Related phenomena: stability of sunspots, instability of magnetic fields in disks (galatic and accretion).
8. Reconnection.
Solar flares, coronal heating.

Bibliography:

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- T. G. Cowling: Magnetohydrodynamics, Bristol, Hilger, 1976
- R. Kippenhahn, C. Noellenhoff: Elementare plasmaphysik, B.I. Wissenschaftsverlag Mannheim, 1975
- L. Mestel, N. O. Weiss: Magnetohydrodynamics, Swiss Society of Astronomy and Astrophysics, Geneva Observatory, 1974
- L. Spitzer Jr.: Physics of fully ionized gases, Interscience, New York, 1962
- E. N. Parker: Origin of solar activity, Ann. Rev. Astron. and Astrophysics 15, 45, 1977
- E. N. Parker: Cosmical magnetic fields, Oxford, Clarendon, 1979

AUXILIARY INSTRUMENTATION AND DETECTORS FOR MEDIUM SIZED
TELESCOPES (Dr. J. Meaburn)

1. High, medium and low dispersion spectrographs.
2. Fibre optic couplers.
3. Stepped Fabry-Perot interferometers.
4. Filter cameras as well as detectors from CCD to photographic plates.

INTERSTELLAR MATTER (Dr. B. Somerville)

1. Historical introduction.
2. General survey of interstellar regions.
3. Interstellar spectroscopy.
4. Properties of diffuse clouds.
5. Interstellar dust.
6. The magnetic field.
7. Molecular clouds and chemical processes.
8. Dust clouds and star formation.
9. HII regions, emission nebulae and supernova remnants.

THE SOLAR SYSTEM (Dr. Z. Kopal)

1. The solar system as a whole - in the past and today: its physics and chemistry.
2. The Moon at a close range - exploration by spacecraft between 1959-1972 and its principal results.
3. The terrestrial planets (Mercury, Venus and Mars) in the light of the spacecraft of the past 20 years.
4. The major planets of the solar system and their satellites - as seen in the past 10 years by Pioneers and Voyagers.
5. Interplanetary space and its principal ingredients (comets, meteors, zodiacal dust).
6. The grand design of the solar system, its age and evolution in the course of time.

THE BINARY STARS (Dr. Z. Kopal)

1. Binary stars in the sky, their distribution in our galaxy and beyond.
2. Close binary systems - how to detect them and what they can disclose to us.
3. Eclipsing binaries, and how to analyze their light changes.
4. Origin and evolution of the binary systems.

= PARTICIPANTS =

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