ANNUAL REPORTS OF THE ASTRONOMICAL INSTITUTES OF GREECE 1972

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Annual Report for the Year 1972 of the :

ASTRONOMICAL INSTITUTE
NATIONAL OBSERVATORY OF ATHENS
ANNUAL REPORT 1972

The activities of this Institute during 1972 may be summarized as follows :

Staff. Dr. C. Banos has obtained a year's leave of absence in order to benefit from a French Government grant to work in France.

Dr. Th. Prokakis has returned from France where he worked for a year on a French Government grant.

Mr. E. Kontizas is appointed Assistant in this Institute.

Instruments. Equipment. The Institute has placed an order with Grubb & Parsons, England, for a reflecting telescope of 1.20 m aperture. This order had been previously approved by the National Committee for Astronomy who also approved the site where this instrument will be installed. This lies near the village Kryoneri, in the province of Corinthia, about 20 kilometers from Kiato, and well away from the Athens industrial area ; tests of the site are under way.

A photoelectric photometer constructed in the laboratories of the University of Manchester by Dr. Meaburn has been adapted to the Newall telescope at Penteli station.

The building destined to serve solar observations at Penteli has been completed.

Observations. a) Sun. The Razdow solar telescope was in continuous operation the entire year. Visual observations were made as well as registrations on movie film of chromospheric events in Hα. Observers were the members of the AWS group supervised by Dr. Prokakis, and Dr. G. Banos was responsible for the entire work.

Radio monitoring of the Sun was also pursued on 1415 MHz, 2695 MHz and 8800 MHz frequencies by the AWS group under the supervision and the responsibility of the same.

Mr. D. Elias continued routine observations of sunspots for determining Wolf numbers and other statistical data. He also investigated seeing conditions.

b) Planets. Dr. C. Banos pursued his work which consisted in photographing the major planets with the Newall telescope of Penteli.

c) Comets. Mr. D. Elias made positional observations of comets.

d) Moon. Mr. D. Elias obtained photographs of the Moon.

e) Stars. Mr. D. Elias continued his observations of variable stars and observed occultations.

Mr. P. Rovithis photographed double stars.

f) Workshop. Constructions and technical works were taken care of by Mrs. E. Sigalas, A. Vouzas, Ch. Bourdas and J. Zacharopoulos.

g) Lab and darkroom. Mr. J. Zacharopoulos and Miss A. Philippakou were responsible for this kind of work.

Research. Dr. G. Banos devoted most of this time to the study of solar spicules at the limb in the K line and to the monitoring of dynamic chromospheric phenomena. He worked in the Hα and K lines.

Dr. C. Banos observed major planets. Dr. Th. Prokakis studied solar radio phenomena, in particular those observed by the Boishot mission with the Arecibo radio telescope.

Mr. E. Sarris studied families of periodical orbits and the restricted three-body problem in a tridimentional continuum.

Mr. E. Kontizas processed his observations of Jupiter.

Mr. Rovithis studied the differential rotation of the Sun and processed observations of double stars.

Mr. D. Elias determined photometric parameters of comets and the influence of the solar wind on the absolute magnitude (Ho) and the factor k, of comets. He also studied seeing conditions in Athens during the daytime.

Time Service. Routine work was pursued by Mr. D. Elias, E. Kontizas, P. Rovithis, J. Zacharopoulos and Miss A. Philippakou.

International Cooperation. Dr. C. Banos spent four months at the Institut d'Astrophysique, in Paris, and two weeks at the Pic-du-Midi Observatory.

Dr. Prokakis spent four months at Meudon, and visited the Observatories of Bordeaux, Utrecht, Slough and Nançay.

Dr. J. Meaburn of Manchester Observatory worked for a month at the station on Penteli.

Monthly reports on solar activity, were regularly forwarded to the competent IAU agencies. Filtergrams were likewise sent to Meudon for the preparation of their chromospheric maps.

Visits. The members of the staff made public demonstrations of astronomical phenomena for the benefit of the public, of schools and of senior educational institutions.

Meetings. Symposia. Prof. Kotsakis, Dr. G. Banos, Mr. E. Sarris, Mr. Prokakis, E. Kontizas and P. Rovithis participated to the work of the first European meeting of the IAU, held in Athens.

Dr. C. Banos followed courses on the atmospheres of planets held at Clermont-Ferrant, France. Dr. Th. Prokakis attended the annual meeting of the JOSO representatives in London, as a representative of the Athens Observatory.

Publications.

1) Antonacopoulos, G. : A numerical Investigation of Secular Terms of the Planetary Disturbing Function ; Astroph. and Space Science, vol 17 p. 267 - 276.

2) Antonacopoulos, G. jointly with D. Bozis : Single Collision Periodic Orbits of a New type ; Astron. and Astroph. vol. 20, p. 73 - 77.

3) Antonacopoulos, G. : The Secular Variations in the Restricted Problem and the Stability of the Circular Orbits ; Astron. and Astroph., vol. 21, p. 265 - 269.

4) Antonacopoulos, G. : Spherical Astronomy, textbook for the use of students of Mathematics, University of Athens, pp. 110.

5) Banos, C. : Properties of the Red Spot of Jupiter in 1971 - 1972. Astron. and Astroph. vol. 19, No 3.

6) Banos, G. : The Quality of the Astronomical images and the choise of Observational sites. Publications of the Athens Observatory.

7) Elias, D. : Preliminary Photometric Parameters of Comet Toba (1971a), IAU Circular, No 2381.

8) Kotsakis, D. : The Structure of the Universe, 2nd edition.

9) Kotsakis, D. : Theory of Errors and the Method of Least Squares, 4th edition.

10) Rovithis, Th. : Nebula Ml. Bulletin of the Geogr. Serv. of the Army.

The Director of the Institute

Prof. D. Kotsakis

DEPARTMENT OF ASTRONOMY
UNIVERSITY OF ATHENS
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The activities of this Department during 1972 were the following :

Staff. 1) Dr. M. D. Papayiannis, Professor of Astronomy and Space Physics of the University of Boston on sabbatical leave spent the year as a Visiting Professor with the University of Athens where he taught Astrophysics and Space Physics to the Senior Students of Physics.

2) Dr. M. Moutsoulas was elected Assoc. Professor of Astronomy on the 31st of July.

3) Mr. M. Zikides obtained his PhD degree.

4) Mr. P. G. Lascarides obtained his PhD degree at the University of Victoria B.C. and was appointed Chief Assistant in November the 28th.

5) Miss. G. Kotsakis was appointed on September 29th 1973.

Teaching. a) Prof. D. Kotsakis taught General Astronomy to the 3d year students and Dynamical Astronomy and Cosmology to the senior students of Mathematics. He also held Courses in Astrophysics and Space Physics for the senior students of Physics.

b) Prof. M. D. Papayiannis lectured on Astrophysics and Space Physics during the first semester.

c) Assistant Mr. M. Zikides carried out the tutorial sections of General Astronomy for the junior Students of Mathematics.

d) Chief Assistant Mr. P. Lascarides carried out the tutorial sections of Astrophysics and Space Physics for the senior students of Physics.

e) Assistant Mr. D. Dionysiou carried out the tutorials of Dynamical Astronomy and Cosmology for the senior students of Mathematics.

f) Assistant Mrs Macris - Antonakopoulou carried out the tutorials of Mathematical Astronomy for the junior students of Mathematics.

g) Laboratory exercises for about 650 junior students of Mathematics were carried out in the Dept. of Astronomy of the University of Athens, at the National Observatory of Athens and the Penteli Astronomical Station. The exercises were supervised by Mr. D. Vaïopoulos, Mr. D. Papathanasoglou, Mr. P. Niarchos, Mrs. M. Arzoglou - Kontizas, Mr. C. Goutis and Mr. Th. Papagianopoulos.

h) Seniors in Physics were given topics from their special assignement by Dr. P. Lascarides, Mr. D. Papathanasoglou and Mrs. M. Arzoglou - Kontizas who also supervised their work.

Instruments. The following instruments were purchased by this Department :

a) A PATERSON dark room exposure-meter.

b) A Zircon lighting system for our DURST L-54.

c) An automatic ROBOT MOTOR-RECORDER 36 BE camera, with time control unit data recording system and 30 m film magazine.

Publications. a) Mr. P. Lascarides : On the Theoretical evolution of Horizontal-Branch stars in Globular Clusters, PhD thesis, University of Victoria, Victoria B.C., 1972.

b) Mr. M. Zikides :

1) Families of Periodic orbits in the Restricted 3-body problem, PhD. Thesis, University of Athens, 1972.

2) Periodic orbits of the Restricted Problem for varius values of the mass-ratio. Proceedings of the First European Astronomical Meeting, Athens, 1972.

c) Mr. D. Dionysiou: Gravitation Theory of A. Einstein, textkook p. 50, Athens, 1972.

d) Prof. D. Kotsakis ;

1) Introduction to Astrophysics, A' Solar System. B' Stars, 3d edition.

2) The Structure of the Universe, 2d edition.

3) Theory of erorrs and Method of Least squares, 4th edition.

Research. Assistant Mr. M. Zikides continued working on Families of Periodic Orbits.

Chief assistant Mr. P. Lascarides worked on the Theoretical Evolution of Horizontal-Branch stars in Clusters, PhD thesis, University of Victoria.

Mr. D. Dionysiou continued working on his PhD. thesis on a theoretical subject of General Relativity.

Mr. D. Dionysiou and Mr. N. Spyrou also derived the integrals of motion of an infenitesimal body moving inside or outside an axially symetrical perfect fluid mass.

Mr. D. Papathanasoglou continued his study of the data from photospheric observations.

Mrs. M. Arzoglou - Kontizas worked on a Planetary program proposed by Prof. A. Dollfus of the Observatory of Meudon. She carried out visual observations of Jupiter with the visual Lyot polarimeter and photographic observations of Jupiter at the Astronomical Station at Penteli with the 63 cm Newall refractor.

Attendance to Seminars and Meetings. The Staff of the Laboratory attended the 1st European Meeting of the I.A.U. in Athens in September 1972.

They also extended the Seminars on Topics of Astronomy held at the National Academy of Athens.

Visits. Professor D. Kotsakis visited France, England and Germany, in January and March 1972 to investigate the possibilities of ordering a reflector for the National Observatory of Athens. Finaly a 1.20 m reflector was orderded with Grubb Parsons Newcastle, England.

The Head of the Department
Professor D. Kotsakis

ASTRONOMICAL DEPARTMENT
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Staff. Dr. G. Bozis resigned from this Department in January 1972.

Drs. G. Bozis and S. Persides were elected Assistant Professors in the Departments of Theoretical Mechanics and Astronomy respectively.

Mr. C. Mertzanidis was appointed Assistant effective February 1972.

Miss D. Mori was appointed secretary effective September 1972.

Mr. Ch. Papageorgiou received his PhD degree in May 1972.

Among the collaborators of the Department were: Dr. M. Zikides and Mr. D. Dionysiou of the Department of Astronomy of the University of Athens. Mrs. E. Georgala of the Nuclear Research Center «Democritos», Mr. M. Mihalodimitrakis of the Department of Theoretical Mechanics of the University of Thessaloniki, Mr. L. Vlachos, Mr. I. Ioannides, Mr. D. Kazanas, Mr. J. Anastasiou, Mr. J. Paschalis and Mr. B. Xanthopoulos.

IAU. During 1972 there was one meeting of the Executive Committee of the IAU and three Officers' Meetings; one of them was held in Thessaloniki.

Three Volumes of Proceedings were published in 1972 and four more are in press. Five Symposia (Nos. 51-55) and seven Colloquia (Nos. 17-27) were held in the same interval.

Under the Auspices of the IAU the «First European Astronomical Meeting» was held in Athens, 7 - 9 September 1972. Over 330 participants from 34 countries attended this Meeting. There were 24 Invited Lectures, 10 Reports on Various European Joint Activities, and over 70 contributed papers. Dr. Contopoulos was a member of the Scientific Organizing Committee and the Local Organizing Committee.

Research Programs. 1) Dr. Contopoulos continued his work on resonance phenomena in spiral galaxies.

a) A linear theory near the inner Lindblad resonance was under study in the case that both k (wave number) and ω (i. e. frequency) are complex, was developed with Mrs. E. Georgala. A paper on this subject is prepared for publication.

b) The problem of constructing non-linear self consistent models near the inner Lindblad resonance was considered.

c) A linear theory near the particle resonance was developed. Various dispersion relations were derived under different assumptions. The main results are:

i) There is no preference of trailing or leading waves near the particle resonance.

ii) There is no second, open, branch of the dispersion relation.

d) A detailed non-linear theory of the orbits near particle resonance was developed. A paper on this subject was accepted for publication in the Astrophysical Journal.

2) Mrs. E. Georgala, under the supervision of Dr. Contopoulos, studied the behaviour of spiral waves near the center of a galaxy. An approximate dispersion relation was found.

3) Dr Contopoulos studied the response problem in open and barred spirals. An approximate dispersion relation was derived. Mr. M. Michalodimitrakis continued his work on orbits in barred spirals. Various families of periodic orbits were found and their stability was studied.

4) Dr. Contopoulos and Mr. Vlachos found the form of a new integral of motion in resonance cases of the dipole field. This integral takes over the place of the first adiabatic invariant near resonances.

5) Mr. Mertzanidis worked under the supervision of Dr. Contopoulos on various problems of resonances in spiral galaxies.

6) Dr. Zikides, under the supervision of Dr. Contopoulos, studied the families k, j, t, z, and v of the restricted three-body problem. A thesis with the title «Families of Periodic Orbits of the Restricted Three Body Problem» (in Greek) was accepted by the University of Athens. A report on these results was presented at the First European Astronomical Meeting. A more detailed paper has been prepared for publication.

7) Mr. Spyrou and Mr. Dionysiou continued their work, under the supervision of Dr. Contopoulos, on the post-Newtonian approximations in the n-body problem. Mr. Dionysiou followed the method of Infeld and Plebanski, considering the masses as singularities, while Mr. Spyrou calculated the effects due to the internal structure and rotation of the n-bodies. A special problem treated was the form of the integrals of motion in the case of a particle moving in the field of an axisymmetric, time independent, distribution of matter. A paper by Messrs Spyrou and Dionysiou under the title «Post-Newtonian Integrals of Motion» was accepted for publication in the Astrophysical Journal.

8) Dr. S. Persides continued his studies of the behavior of test fields in Schwarzschild's space-time.

a) The Laplace and Poisson equations have been solved. Explicit and exact expressions for the scalar field of a point-source in the vicinity of a Schwarzschild black hole have been derived. A paper on the subject has been accepted by the Journal of Mathematical Analysis and Applications.

b) The radial wave equation of the time-dependent scalar field in Schwarzschild's space-time has been studied. A paper describing several properties of the solutions has been accepted by the Journal of Mathematical Physics.

c) In collaboration with Mr. B. Xanthopoulos the time-dependent electromagnetic field in Schwarzschild's space-time has been studied. The main objectives are the behavior of the field on the event horizon and the resulting static field after fall of the source into the black hole. A few results have been announced in a contribution to the First European Astronomical Meeting in Athens.

9) Dr. Persides, Mr. Kazanas and Mr. Anastasiou have studied the nonradial pulsations of a neutron star in the framework of general relativity. The news function has been determined and an attempt is under way to determine the Newman-Penrose constants.

10) Dr. Persides and Mr. Ioannides studied the properties of asymptotically flat spaces in the Einstein-Maxwell theory by expanding the metric tensor in powers of r^{-1}. The equations in the first approximation have been solved and the next step (the second approximation) is presently under study.

11) Dr. Persides and Mr. Paschalis have applied a method of expansion in powers of c^{-1} to the electromagnetic two-body problem in special relativity. The equations have been solved in the two first steps of the approximation procedure. One more step is required to reach the radiation terms.

12) Dr. Ch. Papageorgiou continued his study of chromospheric phenomena visible in Hα and in white light.

Publications.

1. G. Contopoulos: The dynamics of spiral structure (lecture notes), The University of Maryland, 1972.

2. G. Bozis, G. Antonacopoulos: Single collision periodic orbits of a new type, Astronomy and Astrophysics **20**, 73, 1972.

3. S. Persides: Gravitational waves from the center of the Galaxy, Technical Annals, August 1972, Athens (review paper in Greek).

4. N. Spyrou: Gravitational collapse and black holes, Technical Annals, April 1972, Athens (review paper in Greek).

5. Ch. Papageorgiou: «Contribution to the study of chromospheric phenomena visible in total light and in Hα», PhD thesis, May 1972, University of Thessaloniki.

Meetings. Dr. Contopoulos was a lecturer at the NATO Advanced Study Institute in Dynamical Astronomy, Cortina d'Ampezzo, Italy, August 1972. His lectures, under the title «Problems of Stellar Dynamics» will be published in the Proceedings of the Meeting.

Drs. Contopoulos, Persides, Papageorgiou, and Messrs Spyrou and Mertzanidis attended the «First European Astronomical Meeting» in Athens. Dr. Contopoulos, gave an invited lecture under the title «Theory of Spiral Structure. Resonances» and a contributed paper with Dr. M. Zikidis, under the title «Periodic Orbits of the Restricted Problem for Various Values of the Mass Ratio». Dr. Persides presented also a contributed paper under the title «Classical Fields in the Vicinity of a Schwarzschild Black Hole».

Dr. Contopoulos gave an Invited Lecture under the title «Integrals of Motion in Dynamical Systems» at the Meeting of the Italian Physical Society, Cagliari, Italy, in November 1972.

Lectures, Seminars. Dr. G. Contopoulos held seminars at the University of Warsaw and the Torun Observatory of Poland.

Dr. G. Contopoulos, Dr. S. Persides and Mr. Ch. Papageorgiou gave lectures at the Research Center for Astronomy and Applied Mathematics of the Academy of Athens.

Dr. S. Persides gave a series of lectures in the Nuclear Research Center «Democritos».

A seminar on various astronomical topics was held weekly with the collaboration of the Department of Geodetic Astronomy of the University of Thessaloniki.

Visitors. Professor M. Papayiannis (Boston University) gave two lectures in May 1972.

Professor S. Chandrasekhar (University of Chicago) gave a lecture in September 1972.

The head of the Department
Professor G. Contopoulos

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Staff. This consists of Chief Assistants D. Vlachos and M. Katsiaris ; they are both graduates in Mathematics, qualified rural and survey engineers, and have obtained their Ph.D. in this University ; other members of the staff are J. Tsoutras, qualified rural and survey engineer and Miss C. Loukidelis, graduate in Mathematics.

Teaching and Training. During the academic year 1971 - 72, Prof. Argyrakos head of this Department, held courses in General, Spherical and Geodetic Astronomy. He was assisted by his Assistants Dr. Vlachos and Dr. Katsiaris and his Assistants J. Tsoutras and Miss Loukidelis. Special subjects were discussed in seminars held for the last year undergraduates. Courses were attended by 102 + 98 students of the third and fourth year, respectively, of the School of Rural and Survey Engineers.

Scientific Activities. Professor J. Argyrakos published in the University Yearbook an article on the determination of the geographic coordinates using the method of equal heights. Chief Assistant Dr. Vlachos has published two papers : a) Method of determining the errors in the data, and b) Computing a network of trigonometric altitude measurements.

The Director
J. Argyrakos

RESEARCH CENTER FOR ASTRONOMY AND APPLIED MATHEMATICS ACADEMY OF ATHENS

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Staff. Mr. Vasilios Tritakis and Miss Helen Dara were appointed Assistants to this Center on November 16th, and December 1st 1972 respectively. Mr. Constantine Poulakos continued working as Chief Assistant, and Mr. Michael Chondros, secretary of the Center, besides his secretarial work also acted as librarian. During the entire year, Mr. Chondros continued offering voluntary services as Assistant Secretary of, a) The Greek National Committee for Astronomy, b) the Greek National Committee for Mathematics and c) the Greek National Committee for Space Research.

Research Programs. During the year 1972 the following research programs were carried out:

1) Study of the relation between solar activity and terrestrial phenomena (Prof. Dr. J. Xanthakis).

2) Statistical study of the solar activity (Dr. C. Poulakos).

3) Distribution of the M-, S-, and C- type stars in certain areas of the Galaxy (Mr. Tritakis. Till September 1972 he was financially supported by the National Research Foundations).

4) Study of the fine structure of the solar chromosphere (Dr. C. J. Macris).

5) Photometric study based on the ionised calcium U-line spectroheliograms (Dr. C. J. Macris).

6) Study of the atmosphere of planet Mars. (This program has been carried out by the Director of the Center, Dr. C. J. Macris, in cooperation with the physicist Mr. B. Petropoulos, and was financially supported by the Empiricion Foundation).

Instruments. During 1971 the following instruments were acquired:

1) A fast NIKON camera for the study of the solar atmosphere. This instrument was purchased on credits of the Academy of Athens. The price was 25.000 Drms.

2) A microphotometer and isodensitometer JOYCE-LOEBL for the photometric measurement of the pictures of the sun, planets etc. The price of this instrument is 500.000 Drms and the money was made available by the Government within the program of Public Investments.

3) Construction of a device for adjusting the LYOT filter, enabling photography of the solar chromosphere in the Hα hydrogen line.

Publications. During the year 1972, the following publications appeared as contributions from the Research Center for Astronomy and Applied Mathematics, Academy of Athens, series I (Astronomy) or as other publications not being included in the Contributions.

1. Isophotometry of the chromospheric bright and dark mottles on the solar disc, by C. E. Alissandrakis and C. J. Macris (Astrophysical Letters, 1972 vol. 10, p. 59). Contributions No 29.

2. A Study of the Galactic Structure in a Region of Cassiopeia with the help of the M-S- and C-type stars, by C. Poulakos (Memorie della Società Astronomica Italiana, 1971, vol. XIII, p. 421). Contribution No 30.

3) Analysis of Some Aspects of 25 Chromospheric Events. Reduction of the optical data, by R. Falciani, C. J. Macris and M. Rigutti, (Praktika of the Academy of Athens, 1971, Vol. 46, p. 259, and solar Physics 1972, Vol. 26, p. 108). Contribution No 31.

4) Photometric Analysis of Hα Observations of 25 Solar Chromospheric Events, by R. Falciani, C. J. Macris, and M. Rigutti (Memorie Astronomiche dell'Osservatorio di Capodimonte, 1972, Vol. II, No. 5).

5) Chromospheric Spicules by C. J. Macris (Publications of the R.C.A.A.M.) 1972 (Series A, Astronomy No 3).

Forthcoming Publications. 1. Solar Activity and Precipitation by J. Xanthakis (Solar Activity and Interplanetary Phenomena, Proceedings of the first European Astronomical Meeting, September 1972, Athens-Greece).

2) A New Model for the Atmosphere of Mars, by C. J. Macris and B. Petropoulos (Solar Activity and Interplanetary Phenomena, Proceedings of the First European Astronomical Meeting, September 1972, Athens-Greece).

3) A Study of the Areas Index Ia, by C. Poulakos and B. Tritakis (Solar Activity and Interplanetary Phenomena. Proceedings of the First European Astronomical Meeting, September 1972, Athens-Greece).

Library. The classification and setting of the library of the Center continued during 1972. The library was enriched by 180 volumes and 2.000 reprints of scientific publications. Most of the volumes were purchased from the routine credits of the Center while the rest as well as the publications were contributed free by similar institutes of Greece or from abroad in return to publications sent to them by our Center.

Laboratory. The Laboratory of the R.C.A.A.M. will acquire new equipment as soon as further credits are made available.

National Scientific Committees. This Center has been offering secretarial assistance to: 1) The National Astronomical Committee, 2) The National Mathematical Committee, 3) The National Committee for Space Research. The purpose of these Committees is to reinforce scientific research in the respective fields and to communicate with related International Scientific Organizations.

Meetings. In 1972 the National Astronomical Committee organized the first IAU European Astronomical Meeting, which was held in Athens, from the 4th to the 9th of September 1972. President of the Organizing Committee was Prof. J. Xanthakis, member of the Academy, and Secretary was the Director of the Center Dr. C. J. Macris. The responsibility of the preparations fell mainly upon the R.C.A.A.M. and the meeting was very successful.

The scientific staff of the Center partcicipated to this meeting. Papers were preseufed by Prof. J. Xanthakis, Dr. C. J. Macris, Dr. C. Poulakos, and B. Tritakis.

Visitors. During the year 1972 this Center was visited by Dr. B. Valnícek of the Ondrejov Observatory, Chechoslovakia, and Prof. P. Maffei of the Astrophysical Laboratory, Rome, Italy.

International Cooperation. The cooperation of R.C.A.A.M. with Scientific Institutions of other countries was been more important this year. There have been frequent contacts with foreign colleages, and research has been largely based on observational material sent by foreign observatories.

These observatories are:

1) Sacramento Peak Observatory of the U.S.A.

2) Big Bear Observatory of the California Institute of Technology.

3) Arcetri Observatory of Firenze, Italy, and Meudon Observatory of France have loaned to the Center on the request of the Director Dr. C. J. Macris their photographic plates of the sun.

It is the first time that these Institutes have accepted to send out their original scientific material for further research.

Miscellaneous. The Director of the Center Dr. C. J. Macris visited, on special leave, from the Academy of Athens, Arcetri and Meudon Observatories and borrowed observational material to be used for a program which will be carried out in Athens.

Closing this report for 1972, I wish to express my thanks to my collaborators and to the employées of the Central Offices of the Academy of Athens who have substantially assisted us in our work.

The Director of the Center
Dr. C. J. Macris

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UNIVERSITY OF THESSALONIKI
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Staff. The following new appointments were made: 1) Mr. M. Kessoglidis, graduate in Mathematics, was appointed Assistant, effective June 9, 1972, 2) Mr. D. Stavridis, graduate in Mathematics, was appointed Assistant, effective September 23, 1972, 3) Mr. G. Kareklidis, graduate in Mathematics, was appointed Assistant, effective November 11, 1972, 4) Miss M. Spyropoulou was appointed Secretary, effective May 2, 1972. On the other hand the following staff members left the Department: 1) Miss Ch. Papanikolaou resigned from her post as Assistant of the Department, effective May 30, 1972, 2) Mr. C. Tsakis resigned from his post as Assistant of the Department, effective September 1, 1972, 3) Mr. Th. Mylonas resigned from his post as Assistant of the Department, effective October 1, 1972 and 4) Miss E. Tavlikou, resigned from her post as Secretary of the Department, effective July 4, 1972. In this way the staff of the Department on December 31, 1972 consisted of the following persons: 1) Professor L. N. Mavridis, Chairman, 2) Mr. A. C. Tsioumis, Assistant, 3) Mr. G. Asteriadis, Assistant, 4) Mr. M. Kontadakis, Assistant. 5) Mr. M. Kessoglidis, Assistant, 6) Mr. D. Stavridis, Assistant, 7) Mr. G. Kareklidis, Assistant, as well as 8) Miss P. Kyriakidou, Secretary and 9) Miss M. Spyropoulou, Secretary.

Equipment. The following equipment was acquired in 1972: 1) one Grant series 800 comparator-microphotometer with mark III-R measuring engine of 250 mm × 100 mm X and Y travel and photoelectric setting device X-coordinate, 2) one calculator Hewlett-Packard 9810 A, 3) two time-signal receivers Oscilloquartz model T75A, 4) one station wagen Landrover 109WB, series III-long.

Research Programs. The following research programs were carried out during 1972:

1) Photoelectric Photometry of Galactic Cepheids. The discussion of the photoelectric two-color (B, V) observations of the twelve galactic Cepheids RT, RX, SY Aur; RW Cam; SU Cas; VZ Cyg; V, Y, BG Lac; RS Ori; SV, AW Per observed by K. Bahner and L. N. Mavridis in 1956 - 59 with the 72-cm reflector of the Landessternwarte auf dem Königstuhl, Heidelberg was continued. New photoelectric three-color (U, B, V) observations of some of these Cepheids were carried out with the 30-inch reflector of the Department of Geodetic Astronomy installed at the Stephanion Observatory. Also the study of the light variation of the

anomalous Cepheid TU Cas was continued. The final discussion of the three-color (U, B, V) observations of the five Cepheids CD Cyg; X, Z, RR Lac; and U Vul carried out by L. N. Mavridis and A. C. Tsioumis in 1967 - 70 with the 38-cm reflector of the Hamburger Sternwarte installed at the Stephanion Observatory was completed and the first results were published.

2) Rotational Velocities of the Members of Selected Open Clusters (Professor L. N. Mavridis in collaboration with Professor R. Kraft). The study of the rotational velocities of 50 stars in the area of the open cluster NGC 6633 reported last year was continued.

3) Investigation of Problems of Star Formation (Professor L.N. Mavridis in collaboration with Professors B. Strömgren and J. Xanthakis). The survey of the stars with ultraviolet excess contained in an area of 2.000 square degrees in high galactic latitudes reported last year was continued.

4) Distribution of the M-, S- and C- Type Stars in Selected Areas of the Milky Way (Professor L. N. Mavridis). The photographic photometry and the study of the space distribution of the M-, S- and C- type stars found in the four areas centered on the open clusters NGC 188, NGC 752, NGC 7790 and M 25 was continued.

5) Photoelectric Observations of Flare Stars (Professor L. N. Mavridis in collaboration with Messrs. G. Asteriadis, M.E. Contadakis and D. Stavridis). Photoelectric observations of the flare stars 1) BD + 13° 2618, 2) BD + 16° 2708, 3) EV Lac and 4) UV Cet were carried out with the 30-inch reflector of the Department of Geodetic Astronomy installed at the Stephanion Observatory. The results concerning the stars BD + 13° 2618 and BD + 16° 2708 were published, while the results concerning the stars EV Lac and UV Cet are ready for publication. Part of the observations of the star UV Cet were made simultaneously with radio observations at 408 MHz carried out by B. Lovell with the 250 foot MKI radio telescope at Jodrell Bank.

6) Gravity and Magnetic Investigations in Greece. Gravity and magnetic (Z-component) measurements were carried out in different parts of Greece in collaboration with the Institut für die Physik des Erdkörpers der Universität Hamburg and the National Institute for Mining and Geological Research of Athens. The results are being prepared for publication.

7) Propagation of Optical Radiations and Microwaves through the Earth's Atmosphere. (Professor L. N. Mavridis in collaboration with Mr. A. Bandellas). New measurements were obtained in the area of Thessaloniki and the results are being prepared for publication.

The research programs Nos. 3 and 4 were carried out in co-operation with the Research Center for Astronomy and Applied Mathematics, Academy of Athens.

Publications. The following publications appeared in 1972:

Contributions from the Department of Geodetic Astronomy, University of Thessaloniki:

No. 5: G. Asteriadis and L. N. Mavridis, Photoelectric Observations of the Flare Star UV Cet, Commission 27 of the IAU, Information Bulletin on Variable Stars No. 654, 1972.

No. 6: M. E. Contadakis and L. N. Mavridis, Photoelectric Observations of the Flare Star EV Lac, Commission 27 of the IAU, Information Bulletin on Variable Stars No. 669, 1972.

No. 7: G. Asteriadis and L. N. Mavridis, Photoelectric Observations of the Flare Stars BD + 13° 2618 and BD + 16° 2708, Commission 27 of the IAU, Information Bulletin on Variable Stars No. 712, 1972.

Teaching. During the academic year 1972 - 73 Professor L. N. Mavridis delivered courses in General and Spherical Astronomy to the second year undergraduates, in Geodetic Astronomy to the third year undergraduates, and in Higher Geodesy to the third and fourth year undergraduates of the Faculty of Technology, Division of Rural and Surveying Engineering of the University.

Visitors. Professor H. Menzel, Director of the Institut für die Physik des Erdkörpers der Universität Hamburg, visited the Department and gave a colloquium lecture on November 2, 1972.

Miscellaneous. Professor L. N. Mavridis was member of the Local Organizing Committee of the First European Astronomical Meeting held under the auspices of the International Astronomical Union in Athens, September 5 - 8, 1972 and presented the paper: G. Asteriadis, L. N. Mavridis and A. C. Tsioumis «On the Stability of the Light Curves of Galactic Cepheids» The same meeting was also attended by G. Asteriadis, M. Contadakis and A. C. Tsioumis. Professor L. N. Mavridis visited, on the basis of an invitation by the Deutscher Akademischer Austauschdienst, the following scientific institutions: 1) the Astronomisches Rechen-Institut, Heidelberg, 2) the Max-Planck Institut für Astronomie, Heidelberg 3) the Landessternwarte auf dem Königstuhl, Heidelberg, 4) the Institut für Theoretische Geodäsie der Universität Bonn, 5) the Geodätisches Institut der Universität Bonn, 6) the Institut für Theoretische Geodäsie der Technischen Universität, Hannover, 7) the Geodätisches Institut der Technischen Universität Hannover, 8) the Institut für die Physik des Erdkörpers der Universität Hamburg, and discussed problems of mutual interest. He also gave a lecture in the Astronomisches Kolloquium der Universität Heidelberg.

Mr A. Tsioumis received, effective September 1, 1972 a second one-year leave of absence from the Department and thus continued his work at the Astronomisches Rechen-Institut, Heidelberg.

The Head of the Department
Professor L. N. Mavridis

DEPARTMENT OF ASTRONOMY
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Staff. Mr. S. Kapranidis, B. Sc. in Mathematics, was appointed Assistant in September 1972. Also Mr. P. Krommydas, B. Sc. in Physics, was appointed Assistant in December 1972. Miss M. Alexandropoulou resigned in June 1972. Thus the staff of the Department on December 31, 1972 consisted of :

1) Professor S. N. Svolopoulos, Director
2) Mr. S. Kapranidis, Assistant
3) Mr. P. Krommydas, Assistant
4) Mrs. Helen Dimou, Laboratory Technician.

Teaching. Prof. Svolopoulos held courses in Astronomy to the third year undergraduate students of Mathematics.

Laboratory Training for the students were carried out with the assistance of Miss Alexandropoulou and Messrs Kapranidis and Krommydas.

Equipment. The following equipment was purchased during 1972 :

1) A High Voltage Supply, Keithley Instruments, Model 246.
2) A Digital electrometer, Keithley Instruments, Model 615.
3) A Coordinate Comparator, Gaertner Scientific Corporation, Model 1225 - 37.

An Aluminizing plant for the mirror of 24 -inch reflector constructed by «Richard Berg A/B» Stockholm, Sweden, was installed in a specially erected building in the Observing Station at Dourouti.

Research Programs. Prof. Svolopoulos assisted by Mr. Kapranidis made with the Laboratory's 24 -inch reflector photometric observations of eclipsing variables. A note on UBV photometry of UCrB has been published.

Prof. Svolopoulos also pursued spectrophotometric studies of Be-stars on plates taken at the Haute Provence Observatory. A note on the spectrum of 88 Her is under publication.

Meetings. Prof. Svolopoulos participated to the First European Astronomical Meeting under the Auspices of the IAU, Athens, Greece, 4 - 9 September 1972.

Publications. 1) S. N. Svolopoulos and S. Kapranidis: Photoelectric Observations of the eclipsing variable U Coronae Borealis, Information Bulletin on Variable Stars (Commission 27 of IAU) Number 731, 1972.

2) The Sun and the Brans-Dicke Cosmology (in Greek) Technica Chronica, 7/555, 601, 1972.

3) S. N. Svolopoulos: General Astronomy (Text Book in Greek) First Volume, offset edition, pages 242, 1972.

4) S. N. Svolopoulos: General Astronomy (Text Book in Greek) Second Volume, offset edition, pages 252, 1972.

The Head of the Department
Professor S. N. Svolopoulos

DEPARTMENT OF ASTRONOMY
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Staff. Dr. Gr. Antonacopoulos was elected associate Professor or Astronomy.

Teaching. Dr. B. Barbanis held courses in Astronomy to the third year under - graduate students in Mathematics and Physics. He also held a course on Differential Equations for the second and third year students in Mathematics and Physics. Laboratory training of the students in Practical Astronomy was carried out by Assistant Miss H. Livaniou. Assistant Mr. P. Antonopoulos was responsible for the exercises on Differential Equations.

Equipment. The following equipment was acquired during 1972: 1) A Stereomicroscope, Carl Zeiss, 2) A Compucorp 322G, 3) A Standard Questar, 4) A Receiver WVTR-A, 5) A Comet-seeker, Veb Carl Zeiss, 6) Three Sections of the Palomar Sky Atlas.

Research Program. Dr. B. Barbanis worked on linear and nonlinear effects near the particle resonance.

Visitors. Dr. M. Papayiannis, Professor of Astronomy and Space Physics of the University of Boston, visited the Department and gave two lectures on March 6 and 7, 1972.

Publications. 1) B. Barbanis: The Investigation of the Galactic Spiral Structure, (in Greek), Technical Annals, February 1972. 2) B. Barbanis: Fundamental Stellar Families, (in Greek), Publications of the Greek Mathematical Society, 1972.

Meetings. Dr. B. Barbanis was a member of the Organizing Committee of the First IAU European Astronomical Meeting held in Athens, September 4 - 9, 1972. Professors B. Barbanis and J. Hadjidemetriou have been responsible for the editing of the third volume of the Proceedings under the title «Galaxies and Relativistic Astrophysics». Miss Livaniou and Mr. Antonopoulos attended this meeting.

The Head of the Department
Professor B. Barbanis