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CONTENTS

Annual Report for the Year 1979 of the:

NATIONAL OBSERVATORY OF ATHENS

ASTRONOMICAL INSTITUTE

ANNUAL REPORT 1979

Staff: Mr. E. Sigalas has retired from his post as technician of the Institute having completed 35 years of service. Mr. D. Dialetis has received a French Government grant to work at the Meudon Observatory in France and he left in May 1979 with a year's leave of absence. Mr. A. Lainas who did the solar patrol observations resigned and was replaced by Mr. N. Matsopoulos.

Research.

1. **Moon and Planets:** C. Banos continued his three colour photographic observations of Jupiter and especially of the Red Spot with the 1.2 m telescope. E. Sarris participated also in this program.
D. Elias made optical observations of the partial eclipse of the moon of 13-14/3/1979.

2. **Stars and nebulae:** P. Rovithis made observations and analysis of data of the eclipsing binaries u Her, VWCep and AB And with the 1.2 telescope in collaboration with E. Livaniou-Rovithis. He also made observations of nebulae.

E. Kontizas carried out photographic observations of star clusters with the 1.2 m telescope in collaboration with M. Kontizas. He combined ultraviolet and ground based spectra of early type stars for studying their effective temperatures, in collaboration with E. Theodossiou. A paper on this matter was accepted for publication in the Monthly Notices of the R.A.S. He also studied the luminosity function of star clusters of the Small Magellanic Cloud on plates taken with the 1.2 m Schmidt telescope at Coonabarabran, Australia.

E. Sarris carried out photographic observations of star clusters with the 1.2 m telescope and begun to investigate other existing photographic material.

D. Elias carried out the following observations. a. Optical observations of variable stars, flare stars, novae, supernovae and occultations of stars b. Photographic observations of flare stars, supernovae and eclipsing variable stars. c. Photographic observations of stellar regions around novae and nebulae. Finally

he studied the light curves of the eclipsing variables BL Eri and ER Ori, and made photoelectric observations of the probable occultation of the star B.D - 40217 by the asteroid Ceres in 31/7/79.

Reports of these observations are sent to the following Centers:

1. Occultations of Stars: U.S. Naval Observatory, Nautical Almanac Office, Royal Observatory of Greenwich and I.O.I.A.
2. Variable stars: A.A.V.S.O.
3. Novae: Smithsonian Astrophysical Observatory.

Mr. Kurt Locher carried out observations of eclipsing variables with the 25-inch refractor of Pentele and the 1.2 m telescope.

M. Kontizas, P. Niarchos, H. Livaniou-Rovithis and E. Antonopoulou of the University of Athens carried out photoelectric photometry and infrared photometry observations using the equipment of the Astronomical Institute on the 1.2 m. telescope at Kryonerion.

3. **Sun:** Th. Prokakis and D. Dialetis continued their study of the big solar flare of 10 July 1978 in collaboration with C. Alissandrakis. Th. Prokakis continued the study of the radio data from the Astronomical Station of Pentele in collaboration with E. Nikolaides and C. Alissandrakis.

4. **Celestial mechanics:** E. Sarris continued his study of the 3 dimensional elliptic restricted three body problem.

Routine Observations:

A. Lainas and P. Kannavos carried out routine solar observations with the Razdow solar telescope under the supervision of Th. Prokakis. Radiomonitoring of the Sun continued on 1415, 2695, 1000 and 8000 MHZ. D. Elias continued his daily observations of sunspots.

Reports of these observations are sent to the:

1. World Data Centers, «A» Boulder, «B» Moscow, and «C» Paris for flares and filaments.
2. Solar Division, AAVSO, World Data Centers «A» and «B», Zurich Observatory and Fraunhofer Institute for the sunspots.

Time Service: Routine work was carried out by D. Elias at Pentele and J. Zacharopoulos in Athens.

Equipment: E. Kontizas in collaboration with M. Kontizas and E. Nikolaides started the construction of an UBV photometer for the 1.2 m telescope. The optical parts of this instrument were built at the National Observatory workshop by E. Sigalas.

Th. Prokakis and D. Dialetis continued their study of the proposed solar telescope and spectrograph for the Kryonerion Station.

Workshop: E. Sigalas, Ch. Bourdas and A. Vouzas carried out the technical work of the Institute and its Stations of Pentele and Kryonerion. J. Zacharopoulos carried out all the electronic work for the 1.2 m telescope and the Razdow telescope. He did also the aluminization of the primary and secondary mirrors of the 1.2 m telescope.

International cooperation: E. Kontizas spent two months at the Haute Provence Observatory where he worked with Prof. C. Fehrenbach and M. Kontizas on radial velocities of early type supergiants. Preliminary results of this work have been presented at a Colloquium on Supergiants, held at Strasbourg, France. D. Dialetis spent eight months at the Meudon Observatory where he worked on a solar program in collaboration with Dr. Mein.

Meetings - Lectures: C. Banos gave a series of seven lectures on Astronomy at the National Research Foundation of Greece.

The staff of the Institute participated to the seminars on Astronomy held at the Research Center of the Academy of Athens. Th. Prokakis and E. Kontizas were among the speakers of these seminars. E. Kontizas attended the NATO Advanced Study Institute on galactic X ray sources held at Sounion, Greece.

Publications.

1. D. Elias, «Supernova in M 100», **Orion 37,** 138, 1979.
2. D. Elias, «Nova Cygni 1978», IAU Circular No 3349, 1979.
3. P. Rovithis, «Small Variations in Nova Cygni 1975». **Inf. Bull. Var. Stars,** No 1558, 1979.
4. P. Rovithis «Photoelectric Observations of DR Vul», **Inf. Bull. Var. Stars,** No 1564, 1979 (With H. Rovithis-Livaniou).
5. P. Rovithis «Photoelectric Observations of u Her», **Inf. Bull. Var. Stars,** No 1674, 1979 (With H. Rovithis-Livaniou).
6. P. Rovithis «Study of the Nebular - Stellar Photometer of the N.O. of Athens and Construction of a New Photometric Head for it», **Publ. of the Nat. Obs. of Athens,** Series I, No 18, 1979 (in Greek).
7. P. Rovithis «Photometric Results for the Kryonerion Astronomical Station», **Praktika of the Academy of Athens 54,** 1979 (in Greek).
8. P. Rovithis, **«The Moon and its conquest»** Ed. Aurora 1979, (in Greek).

The Director of the Institute
Professor G. CONTOPOULOS

DEPARTMENT OF ASTRONOMY

UNIVERSITY OF ATHENS

ANNUAL REPORT 1979

Staff: Prof. G. Contopoulos was research associate of the European Southern Observatory during July 1979. He was elected chairman of the Board of Directors of the European Journal «Astronomy and Astrophysics», and reelected member of the Board of the Astronomy and Astrophysics Division of the European Physical Society.

Drs. H. Rovithis-Livaniou, D. Papathanasoglou and Th. Papayannopoulos were promoted to chief-assistants.

Miss E. Antonopoulou worked for 3 months at the South African Astronomical Observatory in Sutherland.

Mr. J. Deliyannis worked for 2 months at the Observatoire de Meudon, France.

Dr. Th. Papayannopoulos and Miss J. Manoussoyannaki worked for 10 days each at ESO, Geneva.

Dr. D. Dionysiou and Miss J. Manoussoyannaki left the Department in 1979.

Research:

I. Galactic Dynamics and Related Fields:

1) G. Contopoulos continued his work on spiral galaxies that include resonances, with particular emphasis on barred galaxies. A paper on this subject was published and another one was accepted for publication. The main results of his work were presented at the Texas Colloquium on «Photometry, Kinematics and Dynamics of Galaxies» in August 1979. Further work on self-consistent bars in continuing.

2) G. Contopoulos and Th. Papayannopoulos studied the forms of the orbits in weak and strong bars. A paper on this subject was submitted for publication. Further work includes the response density in weak and strong bars, and a detailed study of the orbits, with emphasis on the escape of stars.

II. Integrals of Motion:

1) G. Contopoulos with P. Michaelidis studied the bifurcations of triple periodic orbits. The characteristics of these orbits do not have a minimum or maximum at the points where they cross the characteristic of simple periodic orbits. This fact was explained by means of the «third integral». A paper on this subject was accepted for publication.

2) G. Contopoulos studied the 4:1 resonance in some simple dynamical systems. This resonance has some peculiar characteristics that were explained theoretically. A paper on this subject was submitted for publication.

3) G. Contopoulos continued his study of invariant surfaces in systems of three degrees of freedom (in collaboration with L. Martinet and P. Magnenat of the Observatoire de Genève).

4) G. Contopoulos and M. Zikides studied the bifurcations of the characteristics of periodic orbits and the formation of ergodic components in a 1:1 resonant system. As the energy approaches the escape energy it seems that the number of the bifurcations of simple periodic orbits and of the ergodic components tends to infinity. A paper on this subject was accepted for publication.

5) P. Michaelidis continued his study of the 3:2 resonance. A paper on this subject was accepted for publication.

6) Ch. Varvoglis completed his thesis on the orbits and integrals of motion in the Astron machine for plasma confinement. Further work comparing the theoretical and numerical results is continuing by G. Contopoulos and Ch. Varvoglis.

III. Celestial Mechanics

M. Zikides continued his study of the u-type families of periodic orbits in the restricted three-body problem. A paper on this subject was accepted for publication.

IV. Stellar Evolution:

P. Laskarides, A. Pinotsis and D. Vaiopoulos continued their study of stellar evolution with variable G. A. Pinotsis completed his thesis (under P. Laskarides) on this subject. Two papers were published.

V. Spectroscopic and Photometric Observations

1) P. Laskarides took 20 spectra of β Cephei stars with the Richardson spectrograph attached to the 26-inch refractor of the Penteli Astronomical Station. He prepared also a manual for the use of this spectrograph.

2) P. Laskarides, P. Vaiopoulos and G. Antonacopoulos completed their

study of ν Eri. A paper on this subject was published.

3) P. Niarchos made photoelectric observations of the eclipsing binaries i Boo, VW Cep and V566 Oph at the Kryonerion Astronomical Station.

4) H. Rovithis-Livaniou and P. Rovithis made photoelectric observations of the eclipsing variables 44i Boo, DR Vul, VW Cer, AB And and U CrB at the Kryonerion Astronomical Station.

5) E. Theodossiou and E. Kontizas continued their study of early type stars in order to find their effective temperatures and chemical composition. A paper on this subject was accepted for publication.

VI. Infrared Astronomy

E. Antonopoulou continued her infrared photometric study of RS CVn type binary stars. She also studied some Wolf-Rayet systems in order to find the possible existence of shells around them.

VII. Solar Observations

1) D. Papathanasoglou, J. Deliyannis and M. Stathopoulou-Tsoga derived the contact times of the solar eclipse of 1976.

2) J. Deliyannis continued his study of spectrophotometric observations of solar prominences.

3) D. Papathanasoglou and J. Deliyannis participated in the study of the proposed Solar Telescope and Spectrograph for the Kryonerion Astronomical Station.

VIII. Instruments

D. Papathanasoglou and J. Deliyannis completed their study of the lens of the Newall telescope in Penteli.

Publications:

1) G. Contopoulos, «The Four-Armed Response near the Lindblad Resonances in Galaxies», **IAU Symp. 84,** 1979, p. 187.

2) G. Contopoulos, «Instabilities in Systems of 3 Degrees of Freedom», in V.G. Szebehely (ed.) «Instabilities in Dynamical Systems, Applications to Celestial Mechanics», D. Reidel Publ. Co., 1979, p. 25.

3) G. Contopoulos, «Inner Lindblad Resonance in Galaxies, Nonlinear Theory III. The Response Density», **Astron. Astrophys. 71,** 229, 1979.

4) G. Contopoulos, «How far do Bars extend?», ESO preprint No 53, 1979.

5) G. Contopoulos, «The 4:1 Resonance», ESO preprint No 69, 1979.

6) P. Laskarides and A.D. Pinotsis, «Theoretical Isochrones in the Case of Stellar Evolution with variable G (Brans-Dicke cosmological Theory)», **Mon. Not. R. Astron. Soc. 187,** 817, 1979.

7) P.G. Laskarides, D.A. Vaiopoulos and G.A. Antonacopoulos, «Atmospheric Parameters of ν Eridani», **Bull. Astron. Inst. Czech. 30,** 369, 1979.

8) A.D. Vaiopoulos and P.G. Laskarides, The Influence of the Age of the Universe of the Stellar Evolution with Variable G», **Astron. Astrophys. 71,** L12, 1979.

9) Th. Papayannopoulos, «Orbits near the Particle Resonance of a Galaxy. I. Numerical Study», **Astron. Astrophys. 77,** 75, 1979.

10) Th. Papayannopoulos, «Orbits near the Particle Resonance of a Galaxy. II. Theoretical Study», **Astron. Astrophys. 79,** 197, 1979.

11) P. Niarchos, «Photoelectric Minima of Eclipsing Variables». **Inf. Bull. Var. Stars,** No 1579, 1979.

12) P. Niarchos, «Photoelectric Observations of the Eclipsing System AH Virginis at Kryonerion Observatory», **Praktika of the Academy of Athens, 54,** 1979.

13) P. Rovithis an H. Rovithis-Livaniou, «Photoelectric Observations of DR Vul», **Inf. Bull. Var. Stars,** No 1564, 1979.

14) P. Rovithis and H. Rovithis-Livaniou, «Photoelectric Observations of u Her», **Inf. Bull. Var. Stars** No 1674, 1979.

15) P. Rovithis and H. Rovithis-Livaniou, «Study of the Nebular-Stellar Photometer of the N.O. of Athens and Construction of a new photometric Head for it», **Publ. of the National Observatory of Athens, Series I,** No 18, 1979.

16) P. Rovithis and H. Rovithis-Livaniou, Photometric Results at the Kryonerion Astronomical Station», **Praktika of the Academy of Athens, 54,** 1979 (in Greek).

17) P.M. Williams and E. Antonopoulou «Cooling of the Newly condensed Shell around HD 193793», **Mon. Not. R. Astron Soc. 187,** 183, 1979.

18) J. Deliyannis, D. Papathanasoglou and M. Stathopouloy-Tsoga, «On the Variation of the Direct Solar Radiation during the Annular Solar Eclipse of April 29, 1976», **Solar Physics 62,** 401, 1979.

Meetings - Lectures

G. Contopoulos was invited lecturer at the following Meetings:

a) Colloquium on «Photometry, Kinematics and Dynamics of Galaxies» (Austin, Texas, 6-8 August 1979), where he spoke on the «Stellar Dynamics of Barred Spirals».

b) A special Session of Commission 33 on «Galactic Dynamics» during the IAU General Assembly in Montreal, Canada (August 1979) where he spoke on «Integrals of Stellar Motion and their Disappearance».

He also gave lectures at ESO (CERN) and Cambridge (England), and he attended an informal meeting on «Arnold diffusion» in Berkeley (California).

Fir ally, he attended meetings of the Executive Committee of the IAU, the Board of Directors of «Astronomy and Astrophysics», and the Astronomy Committee of the European Science Foundation.

P.G. Laskarides was the Local Organizer and a member of the Advisory Committee for the «NATO Advanced Study Institute on Galactic X-Ray Sources» held in Greece (Sounion, Attica) from May 28 to June 9, 1979. The Director of the ASI was Dr. P. Sanford of the University College, London.

The Institute was sponsored by the Greek National Committee for Astronomy and partially supported by the Greek Ministry of Culture and Science. It was attended by 80 participants from other NATO countries, 14 from Greece, one from Indonesia, one from Switzerland and one from USSR. Several members of the Department attended this Institute.

The Proceedings of the ASI will be published in 1980 by J. Wiley and Sons. The Editors are P. Sanford and P. Laskarides.

P. Laskarides attended the Symposium held at the University College, London, from 4 to 6 April 1979, on «The First Year of the International Ultraviolet Explorer» and participated in the celebration of the 50 years of the University of London Observatory.

M. Zikides, P. Niarchos and D. Vaiopoulos attended the XVIIIth General Assembly of the IAU, in Montreal, Canada.

E. Antonopoulou attended the Royal Astronomical Society Meeting in Durham, England (April 1979) and the Anglo-Australian Telescope Symposium in Edinburgh, Scotland (September 1979).

E. Theodossiou and J. Manoussoyannaki attended the International School of Astrophysics «X-Ray Astronomy» in Erice, Italy (July 1979).

The Head of the Department
Professor G. CONTOPOULOS

ASTRONOMY DEPARTMENT

UNIVERSITY OF THESSALONIKI

ANNUAL REPORT 1979

Staff: Dr. B. Barbanis became Professor of Astronomy and Head of the Department on November 1. Dr. S. Persides was temporary Head of the Department until October 31.

Dr. N. Spyrou received in May the «Habilitation Degree» in Astronomy after submitting a dissertation at the Faculty of Physics and Mathematics, University of Thessaloniki.

Dr. N. Spyrou was an invited scientist at the Max-Planck-Institut (MPI) für Physik und Astrophysik (Munich) from July to October 1979.

Dr. B. Xanthopoulos was appointed Chief Assistant of the Department in December.

Mr. D. Papadopoulos went in September to the University of Cincinnati as a postdoctor with an one-year leave of absence from the University of Thessaloniki.

Mrs. K. Vassiliadis was appointed secretary in March.

Thus the staff of the Department at the end of 1979 was as follows:

1) Dr. B. Barbanis, professor, 2) Dr. S. Persides, assistant professor, 3) Dr. N. Spyrou, Dr. Ch. Terzides and Dr. B. Xanthopoulos, chief assistants, 4) Mr. D. Papadopoulos, Mr. N. Caranicolas, Mr. P. Fylactopoulos, Mr. S. Avgoloupis and Mr. H. Varvoglis, assistants, 5) Mrs. F. Papageorgiou, Mrs. Ch. Mertzanides and Mrs. K. Vassiliadis, secretaries, and 6) Mr. K. Papadopoulos, technician.

Research Programs:

I. Galactic Dynamics and Related Fields:

Dr. B. Barbanis worked on the following subjects:

a) The trapping effects on various time-dependent potentials.
b) Characteristics of orbits in a spiral galaxy near the outer Lindblad resonance.
c) The behavior of adiabatic invariants near resonances. A paper on this subject is in preparation.

Dr. Ch. Terzides continued his work on the denisty wave theory of spiral

galaxies. He especially worked on the self consistent problem of the spiral galaxies, examining the behavior of the dispersion relations which describe the spiral structure as given by the theory of Contopoulos.

Mr. N. Caranicolas continued his work under the supervision of Prof. Barbanis on the form of the third integral and periodic orbits in nearly axisymmetric galaxies. This work will soon be submitted as a Ph. D. thesis.

Mr. H. Varvoglis completed his work, under the supervision of Prof. Contopoulos, on the motion of charged particles in the Astron thermonuclear reactor and submitted it as a Ph. D. thesis to the Faculty of Physics and Mathematics of the University of Thessaloniki. The thesis was approved and Mr. Varvoglis is expected to receive his Ph. D. degree in early 1980.

Mr. S. Avgoloupis started to study, under the supervision of Prof. Barbanis, the relationship between adiabatic invariants and the third integral.

II. General Relativity - Relativistic Astrophysics:

Dr. S. Persides continued his work on the structure of asymptotically flat space-times. In particular he studied the possibility of providing a unique boundary with C^∞ metric at spatial and timelike infinity. A paper has been submitted to the Journal of Math. Physics.

Dr. S. Persides studied the global structure of the boundary of an asymptotically flat space-time. A definition has been given unifying null, spatial and timelike infinity. Two papers are in preparation.

Dr. S. Persides and Mr. D. Papadopoulos examined the energy-momentum definition according to the Landau-Lifshitz complex. It has been shown that a covariant formulation is possible. A paper has been accepted for publication in the Journal of General Relativity and Gravitation.

Dr. N. Spyrou continued and completed his work on the dynamical description of realistic binaries in the post-Newtonian arproximation of general relativity. This work was essentially the content of his dissertation for his «Habilitation Degree» in Astronomy.

Dr. N. Spyrou worked on a new method of approximation for the relativistic dynamical description of bounded systems. A joint paper with Dr. A. Caporali of the MPI on the relativistic spin precession of binary stars has been submitted for publication in the Journal of General Relativity and Gravitation. This paper is a collaborated part of Dr. Caporali's thesis and is going to appear also as an «MPI Grüner Bericht».

Dr. N. Spyrou worked on the relation between the exact and the approximation methods for the relativistic dynamical description of bounded systems. As a first result a paper on the relation between the exact Schwarzschild solution and the post-Newtonian far-field one is almost completed.

Dr. N. Spyrou has started recently a research project aiming to the determination (in analogy to Newtonian galactic dynamics) of a «third» integral of motion in the post-Newtonian approximation in the case of galactic systems with time-independent and axially symmetric distributions of mass and velocities.

Dr. B. Xanthopoulos studied a method for generating solutions of the Einstein equations which describe uniformly rotating stars. The transformations which generate such space-times have been explicitly determined.

Dr. B. Xanthopoulos studied the self dual SU(2) and SU(3) Yang-Mills equations using harmonic maps. Five new families of particular solutions have been found and the Bäcklund transformations have been derived. A paper has been submitted to the Journal of Mathematical Physics.

Dr. D. Papadopoulos completed his work under the supervision of Prof. Persides on the transmission of waves in the gravitational field of a Schwarzschild black hole. The first order corrections of a time-dependent scalar field have been determined. This work has been submitted as a Ph. D. thesis to the Faculty of Physics and Mathematics of the University of Thessaloniki and it has been accepted.

III. Observational Astronomy

Mr. Avgoloupis and Mr. Fylactopoulos continued their research work concerning photoelectric photometry of flare stars under the supervision of Prof. Mavridis. Using the Stefani telescope they observed the flare star EV Lac. A paper containing the results of these observations will be submitted to the Information Bulletin on Variable Stars of the Konkoly Observatory, Budapest.

Publications

1. B. Barbanis (with P. Antonopoulos): «Trapped Orbits in a Time-Dependent Potential», Astron. Astrophysics **78**, 195, 1979.

2. S. Persides: «A Definition of Asymptotically Minkowskian Space-Times», J. Math. Physics **20**, 1731, 1979 = Contr. Astron. Dept. Univ. Thessaloniki, No 97.

3. S. Persides: «Energy and Momentum in General Relativity», Gen. Rel. Grav. **10**, 609, 1979 = Contr. Astron. Dept. Univ. Thessaloniki, No 98.

4. N. Spyrou: «Relativistic Dynamical Description of Binary Stars», Dissertation for the «Habilitation Degree», University of Thessaloniki, Greece, 1979 (in Greek).

5. N. Spyrou: «Relativistic Effects in Many-Body Systems of Finite Size, Internal Structure and Internal Motions. I. Self-Accelaration of Astrophysical Systems», Gen. Rel. Grav. **10**, 581, 1979 = Contr. Astron. Dept. Univ. Thessaloniki, No 96.

6. N. Spyrou: «How Realistic is the Concept of the Point-Mass?», Technical Annals **2**, 126, 1978 (review article in Greek).

7. N. Spyrou: «The Laplace Equation and its Solutions», 1979 (in Greek).

Seminars given at the Astronomy Department, University of Thessaloniki.

8. B. Xanthopoulos: «A Technique for Generating Solutions of Einstein's Equation», Proc. Roy. Soc. Lond. **A365,** 381, 1979.

9. B. Xanthopoulos: «Multipole Moments in General Relativity», J. Phys. A. **12,** 1025, 1979.

10. S. Chandrasekhar and B. Xanthopoulos: «On the Metric Perturbations of the Reissner-Nordström Black Hole», Proc. Roy. Soc. Lond. **A367,** 1, 1979.

11. C. Hoenselaers, W. Kinnersley and B. Xanthopoulos: «Generation of Asymptotically Flat, Stationary Spacetimes with any Number of Parameters», Phys. Rev. Lett. **42,** 481, 1979.

12. C. Hoenselaers, W. Kinnersley and B. Xanthopoulos: «Symmetries of the Stationary Einstein-Maxwell Equations. VI: Asymptotically Flat Spacetimes with Arbitrary Multipole Moments», J. Math. Phys. **20,** 2530, 1979.

Meetings:

Dr. B. Barbanis participated in the XVIIth General Assembly of the International Astronomical Union held in Montreal, Canada, from 14-23 August, 1979.

Dr. S. Persides participated in the Second Marcel Grossmann Meeting on the Recent Developments of General Relativity in July at Trieste, Italy.

Lectures:

Dr. S. Persides gave a lecture at the Second Marcel Grossmann Meeting on some recent developments in asymptotic structure.

Dr. N. Spyrou gave lectures at the Max-Planck-Institut für Physik und Astrophysik on his recent research work.

Mr. H. Varvoglis gave a lecture at the Center for Astronomy and Applied Mathematics of the Academy of Athens.

Teaching:

Dr. B. Barbanis taught from November courses on Spherical Astronomy, Celestial Mechanics and Astrophysics to the 3rd year students of Mathematics and the 4th year students of Physics.

Dr. S. Persides taught courses on Spherical Astronomy, Celestial Mechanics, Astrophysics, Space Sciences, Computer Programming and Numerical Analysis to the students of Physics (1st, 3rd and 4th year) and Mathematics (1st, 2nd and 3rd year).

Dr. N. Spyrou taught from October courses on Spherical Astronomy, Celestial Mechanics, Astrophysics, and Cosmology to the 3rd and 4th year students of Mathematics and on Numerical Analysis to the 3rd year students of Physics.

The Head of the Department
Professor B . BARBANIS

DEPARTMENT OF ASTRONOMY

TECHNICAL UNIVERSITY OF ATHENS

ANNUAL REPORT 1979

Staff: During the year 1979 Mr. M. Kyriakopoulos retired from his post as Chief Assistant of the Department. Thus the staff of the Department at the end of 1979 was as follows: 1) Professor Dr. J. Argyrakos, Chairman, 2) Mrs. K. Babilis, Assistant, 3) Miss E. Cheretis, Assistant, 4) Mr. B. Kyriakou, Assistant, 5) Mrs. K. Loukidelis, Assistant, and 6) Mr. G. Missas, Technician.

Teaching and Training: During the academic year 1978-1979 Professor G. Argyrakos, assisted by his Assistants, delivered courses on General, Spherical, Practical, and Geodetical Astronomy. The courses were attended by 24 students of 9th six-month and 106 students of 5th six-month of the Rural and Survey Engineering School of the University.

Scientific Activities: During the academic year the Department continued his effort for acquisition computers' programs for automatically computation of Geodeticoastronomical observations.

The Head of the Department
Professor J. ARGYRAKOS

RESEARCH CENTER FOR ASTRONOMY

AND APPLIED MATHEMATICS

ACADEMY OF ATHENS

ANNUAL REPORT 1979

Staff: Dr. C. J. Macris retired from the post of Director of the Center from June 16, 1979. Thus the staff of the Center at the end of 1979 was: 1) Dr. C. P. Poulakos, Chief Assistant, 2) Dr. B. P. Tritakis, Chief Assistant, 3) Mrs. H. Dara-Papamargariti, Assistant 4) Mr. Th. G. Zachariadis, Assistant, 5) Dr. B. C. Petropoulos, Assistant, 6) Mr. M. C. Chondros, Secretary-Librarian, 7) Mr. E. St. Tsioros, Technician, and 8) Mrs. E. Panousi-Kountourioti, Assistant of the Secretariat.

Scientific Collaborators: Academy of Athens has nominated as unsalaried scientific collaborators of the Center Professors: L. N. Mavridis, C.L. Goudas, and Dr. C.J. Macris.

Research Programs: During the year 1979 the following programs were carried out:

1) Long Term Variation of the Annual Seismic Activity of the Earth, by Prof. J. Xanthakis.

2) Prediction of the Radio Emission Indices of the Sun in the Frequency Range 1000 MHz<F<3750 MHz, by Prof. J. Xanthakis and Dr. C. Poulakos.

3) Photometric Studies of New Galaxies from Plates Taken at the Haute-Provence Observatory with the Schmidt Telescope are Pursued by Prof. J. Xanthakis and Dr. C. Poulakos.

4) Study of the Mean Distribution of the Interplanetary Magnetic Field by Prof. J. Xanthakis and Dr. B. Tritakis.

5) Solar Activity and Terrestrial Phenomena, by Prof. J. Xanthakis and Drs B. Tritakis and B. Petropoulos.

6) Cosmic Rays Modulation, by Prof. J. Xanthakis and Drs. B. Petropoulos and H. Mavromichalaki.

7) Study of the Intensity of Some Rays of the Solar Corona, by Prof. J. Xanthakis and Drs. B. Petropoulos and H. Mavromichalaki.

8) Stars with Strong Emission in the Ha Spectral Region, by Dr. C. Poulakos and Mr. Th. Zachariadis.

9) Study of the Dynamics of the Solar Surges, by Mrs H. Dara-Papamargariti.

10) Study of the Atmospheres of the Planets Mars and Venus, by Drs. C. Macris and B. Petropoulos.

11) Photometric Study of the Solar Granulation, by Drs. C. Macris, C. Alissandrakis and Mr. Th. Zachariadis.

12) Study of the Fine Structure of the Solar Photosphere by Dr. C. Macris.

Publications: The following publications appeared in 1979 as Contributions, Series I, (Astronomy), from the Research Center for Astronomy and Applied Mathematics, Academy of Athens:

1) J. N. Xanthakis: Possible Sun-Weather Correlation. Contribution No. 68 (Nature, vol. 275, p. 775, 1978).

2) J. N. Xanthakis: Possible Sun-Weather Correlation II. Contribution No. 69 (Nature, vol. 280, pp. 254-255, 1979).

3) J. N. Xanthakis and C.P. Poulakos: Prediction of the Radio Emission Indices of the Sun in the Frequency Range 1000 MH_Z - f < 3750 MHZ. Contribution No. 70 (Solar Terrestrial Prediction Proceedings, vol. III, pp. 75-97, 1980).

4) J. N. Xanthakis, C. P. Poulakos, and B.P. Tritakis: The Mean Annual Variation of the Precipitation and the Pressure in the Zone - 10° of the Northern Hemisphere. Contribution No. 71. (Proceedings of the COSPAR, vol.

5) J. N. Xanthakis, B.P. Tritakis, and B.P. Petropoulos: On the Variation of the Annual Mean Sea-Level Pressure in the Latitude Zones of the Northern Hemisphere. Contribution No. 72 (Proceedings of the Solar - Terrestrial Prediction, vol. IV,

6) B. P. Tritakis: A Solar Cycle Variation of the Interplanetary Magnetic Field Configuration Contribution No. 73 (Solar Physics, vol. 63, pp. 207-215, 1979).

7) C. J. Macris: The Variation of the Mean Diameters of the Photospheric Granules near the Sunspots. Contribution No. 74 (Astron. - Astrophys. Vol. 78, pp. 186-189, 1979).

8) C. J. Macris and B. C. Petropoulos: The Physical Parameters of the Venus Atmosphere Computed for Different Chemical Compositions Containing SO_2. Contribution No. 75. (Praktika of the Academy of Athens, Tom 74, pp. 125-145, 1979).

Library: 215 new volumes and 2.500 reprints, mostly from foreign Institutions on an exchange basis, were secured by the Library.

Scientific Instruments: In the course of 1979 the equipment of the electronic calculator Hewlett-Packard No. 9820 was completed by acquiring the Impact-Printer type 9871A accessory. Two calculating machines Hewlett-Packard model No. 97A were also acquired:

Meeting – Scientific Missions: Professor J. Xanthakis, was the President of the Local Organizing Committee of the NATO Advanced Study Institute, organized by Ass. Prof. P. Lascarides at Sounion, Attikis (May 28 to June 9, 1979).

Dr. B. Petropoulos participated in the XVIIth General Assembly of IAU held in Montreal, Canada, 14-23 August, 1979, where he presented two papers, in collaboration with Dr. C. Macris, under the titles: a) «The Intensity of the CO spectrum in the Mars Atmosphre» and b) «A model of the Venus Atmosphere Based of the Measurement of Pioneer».

National Scientific Committes: The Center Continued offering secretarial facilities to the following Committees: 1) National Astronomical Committee, 2) National Committee for Space Research, 3) National Mathematical Committee. President of the mentioned committees is the Academician Prof. J. Xanthakis, Head of the Center, and Secretary M. Chondros. These committees are in contact with the respective International Committees and coordinate the scientific research in Greece.

Cooperation with foreign Institutes: The Center has continued its cooperation with various foreign Institutes, who continue to loan us observational material for our scientific programs.

Miscellaneous: The Greek National Astronomical Committee continued the yearly Astronomical Seminars for the Greek Astronomers. Chairman of the meetings was Professor J. Xanthakis, President of the Committee. Many interesting scientific subjects were presented. Professor L. Martinet, of the observatoire Cantonal de Génève, Suisse, and Professor St. Crimitzis, of the Johns Hopkins University, USA, following and invitation of the Greek National Committee for Astronomy visited our Center and gave a Lecture on November 1979, under the above series.

The Head of the Center
Prof. Dr. J. N. Xanthakis
Member of the Academy of Athens

DEPARTMENT OF GEODETIC ASTRONOMY

UNIVERSITY OF THESSALONIKI

ANNUAL REPORT 1979

Staff: The following new appointments were made: 1) Mr. P. Savaidis graduate in Rural and Surveying Engineering, was appointed Scientific Collaborator of the Department effective December 11, 1979, 2) Mr. G. Mavrias was appointed Secretary of the Department, effective November 7, 1979. Furthermore, Mr. G. Kareklidis resigned from his post as Assistant of the Department, effective October 18, 1979.

Thus, the staff of the Department on December 31, 1979 consisted of the following: 1) Professor L.N. Mavridis, Head of the Department, 2) Dr. A.C. Tsioumis, Chief Assistant, 3) Dr. G. Asteriadis, Chief Assistant, 4) Dr. M.E. Contadakis, Assistant, 5) Mr. D. Stavridis, Assistant, 6) Miss J. Karrinti, Assistant, 7) Mr. D. Arabelos, Assistant, 8) Mr. Ch. Kaltsikis, Assistant, 9) Mr. P. Savaidis, Scientific Collaborator, 10) Miss P. Kyriakidou, Secretary, 11) Mrs. M. Spyropoulou-Topatsi, Secretary, 12) Miss M. Stamatelou, Secretary, 13) Mr. C. Rizos, Secretary, 14) Mr. G. Mavrias, Secretary, 15) Mr. Ch. Papaintoniou, Technician, and 16) Mr. P. Domvros, Driver.

Equipment: The following equipment was acquired in 1979: 1) Two standard time and frequency receivers Kinemetrics, type WWVT, 2) One receiver for time signals Sait Electronics, type MR 14501, 3) One barograph Wolters + Möhring GmbH, no. 78b, 4) One cassette memory unit for the Hewlett-Packard 9810 A calculator.

Research Programs: The following research programs were carried out during 1979:

1) Period Changes of Galactic Cepheids (Professor L.N. Mavridis in collaboration with Dr. K. Bahner). The investigation of period changes of selected galactic Cepheids reported last year, was continued.

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. The first results were included in a paper by D.L. Crawford, L.N. Mavridis and B. Strömgren presented by B. Strömgren in the Hamburg Meeting on Astronomical Problems for Schmidt Telescopes, March 29, 1979.

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 M25 reported last year, was continued.

5) Photoelectric Observations of Flare Stars (Professor L.N. Mavridis in collaboration with Drs. G. Asteriadis and V. Tsikoudi and Messrs. G. Kareklidis, D. Stavridis, P. Varvoglis, P. Phylactopoulos, and S. Avgoloupis). Photoelectric observations of the Flare Stars: 1) UV Cet, 2) BY Dra, and 3) EV Lac were carried out with the 30-inch reflector of the Department installed at the Stephanion Observatory. The results are being prepared for publication.

6) Photoelectric Observations of Suspected Flare Stars (Dr. G. Asteriadis). Photoelectric observations of the Flare Star candidates: 1) Gliese 487 and 2) Gliese 731 were carried out with the 30-inch reflector of the Department installed at the Stephanion Observatory. The results are being prepared for publication.

7) Kinematics of Stellar Systems. The study of the kinematical behaviour of the G and K stars by Dr. A.C. Tsioumis reported last year, was continued. The study of the Kinematics of Flare Stars in the solar neighborhood by Dr. G. Asteriadis as well as the study of the Kinematics of the AGK3 stars with parallax factor depending on the galactic latitude, also by Dr. G. Asteriadis reported last year, were completed and the results are being prepared for publication.

8) Gravity and Magnetic Investigations in Greece (Professor L.N. Mavridis in collaboration with Mr. D. Arabelos and Miss J. Karrinti). The discussion of the gravity and magnetic measurements carried out by the Department in various areas of Greece during the last years was continued.

9) Propagation of Optical Radiation and Microwaves through the Earth's Atmosphere. The study of lateral refraction in the area of Thrace reported last year, was continued (Professor L.N. Mavridis in collaboration with Mr. A. Gounaris). The study of the seasonal variation of the refractivity N of the air for microwaves in the areas of Athens, Thessaloniki and Heraklion by Mr. P. Savaidis reported last year, was continued.

10) Study of the Deviation of the Vertical in Northern Greece (Professor L.N. Mavridis in collaboration with Dr. A.C. Tsioumis and Mr. D. Stavridis).

The study of the deviation of the vertical in various areas of Northern Greece reported last year, was continued.

11) Earthquake Prediction by Geodetic and Geophysical Methods (Professor L.N. Mavridis in collaboration with Prof. A. Bandellas and Mr. A. Gounaris). The high precision gravity and magnetic survey in the area of the lakes Ag. Vassiliou and Volvi reported last year, was continued.

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 1979:

I. Contributions from the Department of Geodetic Astronomy. University of Thessaloniki:

No. 22: M.E. Contadakis, G. Kareklidis, L.N. Mavridis, D.C. Stavridis: Photoelectric Observations of the Flare Star YZ CMi in 1974, 1975. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1620, 1979.

No. 23: M.E. Contadakis, G. Kareklidis, L.N. Mavridis, A.C. Tsioumis: Photoelectric Observations of the Flare Star EV Lac in 1974. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1653, 1979.

No. 24: M.E. Contadakis, G. Kareklidis, L.N. Mavridis, D. Stavridis, A.C. Tsioumis: Photoelectric Observations of the Flare Star UV Cet in 1974, 1975. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1654, 1979.

II. Publications (in Greek language) of the Department of Geodetic Astronomy, University of Thessaloniki:

No. 14: Ch. Kaltsikis, D. Stavridis, A. Tsioumis: A Study of the Deflection of the Vertical in Various Regions of Greece. Annals, Faculty of Technology, Division of Rural and Surveying Engineering, University of Thessaloniki Vol. 7, pp. 39-54, 1978.

No. 15: A.C. Tsioumis: Optimal Places of Fundamental Stars. Bulletin of the Hellenic Military Geographical Service No. 113, pp. 43-118, 1978.

No. 16: A.C. Tsioumis: Determination of the Analytical Form of the Geodesics in the Hatt Projection. Applications. Bulletin of the Hellenic Military Geographical Service No. 115, pp. 85-101, 1978.

III. Also the following pyblications:

1) L. N. Mavridis: The Greek University System: Organization and Autonomy. In «Reform and Development of Tertiaty Education in Greece», pp. 17-47, Athens: Hellenic Republic, Ministry of National Education and Cults, 1979.

2) L.N. Mavridis (Editor): Astronomy Educational Material. Addendum 1976-79. Part C: Material in Other Landuages Besides English and Slavic

Languages. Thessaliniki: Department of Geodetic Astronomy, University of Thessaloniki, 1979.

3) L. N. Mavridis: Programme of Cooperative Flare Star Observations for 1976. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1193, 1976.

4) L. N. Mavridis: Programme of Cooperative Flare Star Observations for 1977. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1234, 1977.

5) L. N. Mavridis: Programme of Cooperative Flare Star Observations for 1978. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1375, 1977.

6) L. N. Mavridis: Supplementary Programme of Cooperative Flare Star Observations for 1978. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1467, 1978.

7) L. N. Mavridis: Programme of Cooperative Flare Star Observations for 1979. Commission 27 of the IAU, Information Bulletin on Variable Stars No. 1520, 1978.

8) M. E. Contadakis: Spectroscopic Study of the CaII Infrared Triplet in S-Type Mira Variable Stars. PhD Thesis, Faculty of Sciences, University of Heidelberg, 1979.

9) J. Solf, M. E. Contadakis: Beobachtungen der infraroten CaII Emissionslinien in Mira - Veränderlichen. Mitteilungen der Astronomischen Gesellschaft Nr. 45, pp. 142-144, 1979.

Teaching: Professor L.N. Mavridis delivered during the academic year 1978-1979 courses in Geodetic Astronomy to the third-year undergraduates and in Higher Geodesy to the fourth-year undergraduates of the Division of Rural and Surveying Engineering, Faculty of Technology of the University. Chief Assistant Dr. A. Tsioumis delivered during the same academic year courses in Higher Geodesy to the third-year undergraduates and in Cartography to the fifth-year undergraduates of the same Division. Chief Assistant Dr. G. Asteriadis also delivered during the same academic year courses in Higher Geodesy to the fifth-year undergraduates of the same Division.

Visitors: Dr. M. K. Tsvetkov, Department of Astronomy, Bulgarian Academy of Sciences, visited the Department and the Stephanion Observatory in July 1979. Also Prof. Dr. K. B. Serafimov President, Bulgarian National Committee for Exploration and Use of Space and Director, Central Laboratory for Space Research and Bulgarian Institute of Astronomy, visited the Department and gave a colloquium lecture on November 5, 1979.

Miscellaneous: Professor L.N. Mavridis continued acting as Director General of Higher Education, Ministry of National Education and Cults. He resigned from this post effective October 1, 1979. Professor L.N. Mavridis was appointed, effective April 9, 1979 Vice-President of the Greek National Committee on Seismic Risk Reduction and Disaster Prevention. Professor L. N. Mavridis was reappointed during the XVIIth General Assembly of the IAU, help in Montreal, Canada from 14 to 23 August 1979, member of the Organizing Committee of the IAU Commission No. 46 (Teaching of Astronomy) for the period 1979-1982. During the same General Assembly he resigned from the post of the Chairman of the IAU Commission No. 27 (Variable Stars), Working Group on Flare Stars.

Professor L.N. Mavridis participated in the following meetings of the Council of Europe:

1) In the meeting of the Working Group on the «Reform and Development of Tertiary (Post-Secondary) Education in Southern Europe» held in Nicosia, Cyprus, September 24-27, 1979, and 2) in the second meeting of the «Standing Conference on University Problems» held in Strasbourg, France, November 27-28, 1979.

Professor L.N. Mavridis participated also in the following meetings:

1) In the meeting of the Drafting Committee for the Regional UNESCO/UNDP Program on «Earthquake Risk Reduction in the Balkan Region» held in Belgrade, Jugoslavia, October 16-18, 1979.

2) In the 8th Session of the United Nations Group of Experts on the Standardization of Geographical Names held in New York between February 26 and March 10, 1979.

3) In the meeting of the Joint Committee for the preparation of the program for cultural exchanges between Greece and Syria held in Damascus, Syria, February 17-22, 1979.

Mr. M.E. Contadakis received his PhD degree from the Faculty of Sciences, University of Heidelberg in November 1979.

Mr. D. Arabelos received, effective October 1, 1979, a second one-year leave of absence from the Department and continued working at the Institut für Theoretische Geodäsie, Technische Universität Hannover.

Mr. Ch. Kaltsikis returned from his two-years leave of absence at the Lehrstuhl für Geodäsie, Technische Universität, München and assumed again his duties in the Department, effective October 20, 1979.

The Head of the Department
Professor L.N. MAVRIDIS

DEPARTMENT OF ASTRONOMY

UNIVERSITY OF IOANNINA

ANNUAL REPORT 1979

Staff: Mr. D. Rizos left the University of Ioannina in July of 1979. The staff of the Department on December 31, 1979 consisted of the following persons: 1) Professor G. Banos, head of the Department, 2) Dr. V. Tsikoudi, chief assistant, 3) Mr. Ph. Krommydas, assistant, 4) Mrs. H. Dimou-Drosou, secretary, 5) Mr. Chr. Nakas, technician.

Teaching: Prof. G. Banos held courses in Astronomy to the third-year undergraduate students of Pysics.

Dr. V. Tsikoudi and Mr. D. Rizos held tutorial courses and exercises in Astronomy to the same students.

Research: Prof. G. Banos worked on solar activity and related phenomena. Mrs. H. Dara continued her work on the solar prominences, under the supervision of Prof. Banos.

Dr. V. Tsikoudi did photoelectric observations in July and October, of the flare stars BY Dra, EQ Peg and UV Cet, using the 30 reflector of the Stefanion Astronomical Observatory. Analysis of the observations and further study of flare stars are in progress. Her research also included the study of SO galaxies.

Mr. Ph. Krommydas continued his work on characteristics of radio galaxies in cooperation with the University of Innsbruck, Austria.

Equipment: The following equipment were acquired: an 1P21 RCA photomultiplier with a housing and cooling system.

Miscellaneous: Prof. G. Banos was elected Rector of the University of Ioannina and took up duties in September.

Dr. V. Tsikoudi attended the NATO Advanced Study Institute on Galactic X-ray Sources held at Cape Sounion, Greece, during May 28 - June 9, 1979. She

gave a lecture on Lenticular (SO) Galaxies at the Center for Astronomy and Applied Mathematics of the Academy of Athens.

Mr. F. Krommydas attended the 9th Texas Relativistic Astrophysics Conference held in Munich in December of 1978. He also took part in the Austrian Astronomical Society Conference, held in Innsbruck during February of 1979, where he presented a paper on «Statistics of Stellar Counts».

Mers. J. Zacharopoulos and Ch. Bourdas, of the National Observatory of Athens, spent four days in May at the Dourouti station of the Department, working on the aluminisation of the 24″ mirror.

All members of the Department spent time working on the Dourouti Astronomical Station and on the 24″ telescope.

Visitors: Professor D. Kotsakis of the University of Athens visited the Department and gave a lecture on Large Radio Telescopes.

Dr. N. Shakura from the University of Moscow, who also visited the Department, lectured on «X-ray Emission from Accretion Disks».

Publications: Tsikoudi, V.: «Photometry and Structure of Lenticular Galaxies I. NGC 3115» Ap. J. **234,** 842, 1979.

The Head of the Department
Professor G. BANOS

DEPARTMENT OF ASTRONOMY

UNIVERSITY OF PATRAS

ANNUAL REPORT 1979

Staff: Prof. B. Barbanis was appointed Professor of Astronomy at the University of Thessaloniki, Greece. He resumed his new duties in November 1979. Prof. Gr. Antonacopoulos was assumed the direction of Laboratory of Astronomy. Dr. P. Antonopoulos was appointed Professor in the Centre of Higher Technical Education (KATEE). He resumed his new duties in September 1979. Mr. Zafiropoulos is still on leave of absence on a Ph. D. course at the University of Manchester.

Teaching: Prof. B. Barbanis held courses in General Astronomy, Dynamical Astronomy and Cosmology to the students of Mathematics and Physics, Associate Prof. Gr. Antonacopoulos held courses in General Astronomy, Astrophysics and Analytical Geometry. Dr. P. Antonopoulos and Mrs. C. Flogaiti-Giannoulatou held tutorial courses and exercises in Astronomy and Astrophysics, whereas the former held tutorials in Dynamical Astronomy and Cosmology.

Research Program: Dr. Antonacopoulos worked on some subjects on the post-Newtonian approximation of General Relativity.

Meetings: Prof. B. Barbanis and Dr. E. Evangelidis attended the IAU meeting in Montreal, Canada.

Publications: 1) Gr. Antonacopoulos: The Problem of Motions up to the Second Post-Newtonian Approximation in General Relativity Theory, Astroph. and Space Science Vol. **62,** 1979. 2) Gr. Antonacopoulos and E. Tsoupakis: The Periastron Advance in the Second Post-Newtonian Approximation in General Relativity, Astroph. and Space Science Vol. **62,** 1979. 3) Gr. Antonacopoulos

and E. Tsoupakis: Angular Momentum Flux from an isolated System of N-Bodies in Higher Multipole Moments, Astroph. and Space Science Vol. **62**, 1979.

Acting Head of the Department
Professor GR. ANTONACOPOULOS

DEPARTMENT OF ASTROPHYSICS

UNIVERSITY OF ATHENS

ANNUAL REPORT 1979

Staff: Dr. M Arzoglou-Kontiza spent two months (October and November) at the Haute Provence Observatory.

Dr. C. Alissandrakis worked as «aide astronome» from July to October at the Observatory of Pic du Midi. Also, he spent two weeks at the Astronomy Program of the University of Maryland and visited the Observatory of Meudon for one week in October.

Dr. X. Moussas was appointed Chief Assistant. He visited the Imperial College from April 25 to May 17 and from July 21 to September 14, where he worked in collaboration with the College's Cosmic Rays and Space Physics Group.

Miss P. Preka and Mr. E. Danezis continued to work as Scientific Assistants and Mrs V. Sarrou-Vaiopoulos as a Laboratory Technician.

Mr. E. Nicolaides has worked since March 1979 as assistant supported by a grant from the Hellenic National Research Foundation.

Teaching

Prof. S.N. Svolopoulos held courses on Astrophysics for the fourth-year undergraduate students of Physics as well as courses on Space Physics to the third year undergraduates of Physics. About 20 students worked their Thesis on Astrophysics for obtaining B.Sc. in Physics, under the supervision of Prof. Svolopoulos, Drs Arzoglou-Kontiza, Alissandrakis and Moussas, Miss Preka and Mr. Danezis.

Research

I. Stars and Stellar Systems

1. S.N. Svolopoulos continued his studies on the spectra of B stars.

2. M. Arzoglou-Kontiza together with E. Danezis determined star densities and tidal radii of stellar clusters in the Small Magellanic Cloud from Schmidt plates supplied by the Royal Observatory of Edinburgh.

3. M. Arzoglou-Kontiza together with E. Kontizas continued their studies on the luminosity functions of star clusters in the Small Magellanic Cloud.

4. M. Arzoglou-Kontiza together with E. Kontizas and E. Danezis started photographic observations of star clusters with the 1,2 m telescope of the National Observatory of Athens at Kryonerion.

5. M. Arzoglou-Kontiza during her stay at Haute Provence Observatory studied the radial velocities from Hydrogen lines of early supergiants, in collaboration with Prof. Ch. Ferhenbach.

II. Solar Physics

1. C. Alissandrakis in collaboration with Drs Kundu and Lantos completed the interpretation of the 6 cm- emission of a solar active region that had been observed at Westerbork, by using simple models and magnetic field observations made at Meudon. The physical conditions above the spots in the transition region were derived.
He also made computation of the emission of unipolar sunspots in the wavelength region of 3 to 21 cm to determine the effect of the magnetic field above the spots.

2. C. Alissandrakis in collaboration with Th. Prokakis and D. Dialetis of the National Observatory of Athens and P. Preka continued the study of the solar burst of July 10, 1978.

3. C. Alissandrakis, Th. Prokakis and E. Nicolaides started a study of patrol observations with the solar radio telescope at the Astronomical Station at Penteli at the frequencies of 1415, 2695, 4995 and 8800 MHz, in order to study the evolution of the radio burst spectrum in centimeter wavelengths. This research is supported by a grant from the Hellenic National Research Foundation.

4. P. Preka, in collaboration with C. Alissandrakis made computation of the gyrosynchrotron radiation which will be used in theoretical models of the centimetric emission of the solar bursts.

5. C. Alissandrakis collaborated with Docent K. Macris and Th. Zachariadis of the Research Centre for Astronomy and Applied Mathematics of the Academy of Athens in an investigation of the intensity of the solar granulation using high resolution photographs taken at Pic du Midi and Sacramento Peak.

6. C. Alissandrakis during his stay at Pic du Midi obtained high resolution photographs of active regions in H_α with a Halle-filter supplied by Docent K. Macris, using the 50 cm refractor of Pic du Midi. With these observations, studies of the development of the magnetic fields in active regions are under way by C. Alissandrakis, C. Macris and Th. Zachariadis.

III. Space Physics

1. X. Moussas continued his studies on the propagation of energetic particles in the interplanetary space. He investigated the interaction of particles with the interplanetary magnetic field and by computing the rate of energy change he obtained the diffusion coefficients of the pitch angle and diffusion coefficient in energy space as a function of the distance from the sun.

2. X. Moussas in collaboration with J.J. Quenby of the Imperial College of the University of London and S. Cecchini of TESPE/CNR, Bologne carried on the investigation on the use of a developed form of Fokker-Planck equation including a term concerning diffusion in energy space and they succeeded in obtaining more satisfactory solutions for the propagation of particles from flares at large heliocentric distances from the sun.

Publications

1. Alissandrakis C, Bonanos S: This years Nobel Prize and modern Cosmology, (in Greek), Review of Physics, No. 1, p. 7.

2. M. Moutsoulas and P. Preka: Morphological Characteristics of lunar craters with small Depth/Diameter Ratio, Part I. The Moon and the Planets, 21, (No. 3.), 299.

Meetings

Prof. Svolopoulos attended the IAU General Assembly in Montreal.

Dr. Alissandrakis participated in IAU Symposium 86, in College Park, Maryland on «Radio Physics of the Sun» and presented a paper on «Active Region Magnetic Fields and cm-λ Emission».

Dr. Moussas attended the «Discussion Meeting on Elementary Particle Physics, Astrophysics and Cosmology» in London, during May.

All the members of the Department attended the «1979 NATO, Advanced Study Institute on Galactic X-ray Sources» held in Sounion, Greece, during June.

Lectures

Dr. Alissandrakis gave a lecture on: «High Resolution H_α Observations of Solar Active Regions» on October 30, in Meudon.

Drs Alisandrakis, Arzoglou-Kontiza and Moussas gave lectures in the weekly seminars organized by the National Astronomical Committee of Greece.

Also, Dr. Alissandrakis gave a lecture on solar atmospheric processes in the weekly seminars «Foundations of Sciences» of the Department of Physics, while Mr. Danezis gave a general Lecture on Astrophysics at the Nuclear Research Centre «Democritos».

Miscellaneous

Dr. Arzoglou-Kotniza together with E. Kontiza, E. Nicolaides and E. Sygalas, a former technician at the National Observatory of Athens, undertook the construction of a UBV-photoelectric photometer. This project is financed by a grant from the Hellenic National Research Foundation.

Dr. Alissandrakis participated in the working group for the construction of a solar-telescope and spectrograph at the Astronomical Station at Kryonerion.

Also, he participated in the working group of the National Observatory of Athens for the «Solar Maximum Year».

Dr. Alissandrakis was a member of the Editorial Board of the «Review of Physics» and Dr. Moussas was a member of the Editorial Board of the «Physical World»; both journals are published by the Hellenic Physical Society.

The Head of the Department,
Professor S.N. SVOLOPOULOS