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NATIONAL OBSERVATORY OF ATHENS

ASTRONOMICAL INSTITUTE

SCIENTIFIC REPORT FOR THE YEARS 1981-1989

Report 1981-1986

Staff:

Prof. Dr. C.J. Macris took over the directorship of the Institute on August 1983.

Drs. C. Banos, Th. Prokakis, E. Sarris, P. Rovithis, E. Kontizas and D. Dialetis were named signor researchers on June 1985 according the law 1514/1985.

Mr. George Demou, was appointed as technician of the Institute on 1981.

Mr. N. Matsopoulos resigned on February 1984 in order to make his service in the army till November 1985. He was appointed as technician of the Institute on March 1986 and from May 1987 he was detached from the institute to computer center of the observation.

Dr. Georgia Tsiropoula was appointed as scientific collaborator of the Institute on June 1985. Mr. S. Argyropoulos was appointed as post graduate student of the institute from 1/5/1989. Dr. P. Hamzios was appointed as scientific collaborator of the Institute from 15/12/1989. Mr. Th. Varsos was appointed as electronician of the Institute on 1/2/1985.

Mr. Anastasios Dapergolas was appointed as scientific collaborator of the Institute on June 1985.

Mrs. Kalliopi Klironomou was appointed as electronician of the Institute on 1/2/1985.

Mr. Paris Vardaxoglou was appointed as technician of the Institute on 1/2/1986.

Mr. D. Elias has retired from his post of technician on 22/10/1986.

Mr. A. Georgakilas was appointed as post-graduate student of the Institute from January 1988.

Dr. J. Bellas was appointed as scientific collaborator of the Institute from 15/12/1989.

Research for the period 1981-1986.

1. Sun

Drs. C. Macris, Th. Prokakis, D. Dialetis, E. Sarris, G. Tsiropoula, are collaborating in the following programs:

1. Study of solar seeing for localization of a good site in Greece or Cyprus for JOSO (Macris, Prokakis, Dialetis).

2. Study of simple or Homologous flares (Prokakis, Dialetis, Alissandrakis).

3. Motion of bright material into an eruptive prominence (Macris, Prokakis,

Dialetis, Tsiropoula).

4. Study of solar granulation (Macris, Prokakis, Dialetis, Sarris, and R. Muller of the Pic-du-Midi Observatory).

5. Study of fine structure of sunspots penumbrae (Macris, Prokakis, Dialetis, Tsiropoula).

6. Characteristics of solar flare energy release (Prokakis, Dialetis, Machado, Y. Chiao, S.T. Wu of NASA).

7. Study of the velocity and magnetic field of sunspots (D. Dialetis, P. Mein, G. Simon, B. Schmieder, of the Meudon Observatory, C. Alissandrakis).

8. Study of velocity fields in GIV spectral line with S.M.M./NASA/UVSP data (Dialetis, Alissandrakis, Meudon group).

9. Spectroscopic study of solar radio bursts and their geophysical influence (Drs. C. Caroubalos, G. Moraitis, C. Alissandrakis, D. Dialetis, Chr. Kouveliot, P. Poquerusse, Cl. Perceh, P. Crepels of the Meudon Observatory).

10. Study of radiation of the night sky in two wave lengths Th. Prokakis, G. Moraitis and M. Gogoshev of the University of Sofia).

II. Night astronomy

a. Dr. C. Banos continued his program of study of the atmospheric activity of Jupiter in collaboration with Dr. B. Petropoulos and E. Sarris.

He also begun a program of study of the upper and lower atmosphere of Jupiter based on the results of Voyagers in collaboration with Dr. B. Petropoulos.

b. Dr. P. Rovithis continued his program on the:

1. Study of eclipsing binaries in collaboration with assist. Prof. Panagiotis Niarchos and Helen Livanou-Rovithis.

2. Study of nebulae in collaboration with assist. Prof. Helen Livanou-Rovithis.

c. Dr. E. Kontizas worked on the following programs:

1. Extragalactic astronomy.

2. Spectroscopic study of stars. In this program he is in collaboration with:

Dr. D. Morgan, Royal Observatory of Edinburgh

Dr. M. Bruck, royal Observatory of Edinburgh

Dr. R. Cannon, director of A.A.T., Australia.

Dr. M. Kontizas assist. Prof. of the University of Athens, Anastasios Dapergolas, E. Xiradaki and M. Metaxa post graduated students of the University of Athens.

3. Etude spectrale de la structure des enveloppes stellaires a l'aide des données d'Observation obtenus dans l'ultraviolet et le visible «in collaboration with Prof. J. Lequeux and M. Azzopardi.

4. Procedure di dimulazioni ed analisi di amasi stellari e globulari in collaborazione with assist. Prof. M. Kontizas,

Dr. An. Dapergolas, Prof. G. Sedmak, Prof. V. Castellani, Dr. M. Pucillo, Dr. L. Rusconi, Dr. P. Santini, and Dr. R. Smareglia.

5. Tests of evolutionary theory using colour-magnitude diagrams. In collaboration with assist. Prof. M. Kontizas and Mr. An. Dapergolas.

6. Binary stars in clusters in collaboration with Prof. M. Konti and E. Xiradaki, D. Hadjidimitriou, and Mr. M. Chrysovergis.

7. Distribution of spectral types in LMC clusters, in collaboration with Dr. Morgan of the (Observatory of Edinburgh) Assist. Prof. M. Kontizas and Dr. A. Dapergolas.

8. Faint small clusters in LMC, in collaboration with Assist. Prof. M. Kontizas and M. Metaxa.

9. Dynamical studies of global clusters, in collaboration with Prof. M. Kontizas, M. Metaxa and M. Chrysovergis.

d. Dr. E. Sarris, continued his program in celestial mechanics studying the integrals of motion in the elliptical three body problem.

He also participated in the program of study of the activity in the atmosphere of Jupiter collaborating with Dr. C. Banos, and of luminosity function of the cluster 47 Tuc.

e. Dr. Anast. Dapergolas participated in programs referred in paragraph 2,4,5,7 as well as in a program of study of stellar populations in galaxies in collaboration with assist. Prof. M. Kontizas.

Observations 1981-1986

Sun

1. **Routine observations:** Solar routine observations (Optical) in Ha line and white light, Radio in 4 different frequencies on cm-range) were carried out by the A.W.S. staff till September 1985, while in 1986 were continued by the technicians N. Matsopoulos, Th. Varsos, K. Klironomou and P. Vardaxoglou. Mr. D. Elias continued the sunspots observations till October 1986.

Every month reports were sent by the upper staff of observers to the international Centers in Paris, Moscow, Liege etc.

2. **Observations for International Cooperation:** During the solar Maximum Year (SMY) in 1980-1981 an International campaign using every type of earth-based and space instruments was carried out for the Sun. The aims was: the flare build-up study (FBS) and the solar energy release in flare (SERF).

For this program the National Observatory of Athens in collaboration with Prof. G. Banos of Ioannina University an automatic system for the cinematographic observation of the sun in three wavelengths (Ha, K. White light) was used.

Two observational periods of the Sun were carried out. In the first, September and October 1980, a large number of solar astronomers helped the observations (Prokakis, D. Dialetis, I. Zacharopoulos, N. Matsopoulos and P. Cannavos from Athens Observatory - C. Alissandrakis, D. Papathanasoglou, X. Moussas, J. Deliyiannis, P. Preka from Athens University and H. Dara, Th. Zachariadis from the (Academy of Athens). In the second period, May 1981, G. Tsiropoula and N. Matsopoulos were the observers.

This observational material was used for the study of solar flares.

2. Night Astronomy

Observations were carried out with the 1.2 m telescope of Kryonerion Astronomical Center.

Dr. C. Banos, carried out photographic observations of Jupiter with the 1,2 m. telescope of the Kryonerion Astronomical Station to study properties of its atmosphere.

Dr. P. Rovithis carried out photoelectrical observations of eclipsing binaries and of Barnard's loop in the lines Ha and "N 11" with the 1.2 m. telescope.

Dr. E. Kontizas carried out photographic photometry of clusters, calibration and tests of U BV photometry.

Dr. E. Sarris carried out photographic observations of clusters and photometric observations of RR Lyrae Stars.

Mr. D. Elias carried out the following observations: optical photoelectric and photographic observations of RR Lyrae Stars.

Mr. D. Elias carried out the following observations: optical photoelectric and photographic observations of variable stars, occultation of stars, observation of comets, novae.

Reports of these observations were sent to the following centers:

1) Occultation of stars:

a. International Lawell occultation center, Tokyo, Japan. b. 1010

2) Variable stars: AAVSO

3) Novae: Smithsonian Astrophysical Observatory.

In the same telescope of 1.2 m. kryonerion different programs were carried out mainly in photoelectric photometry and infrared astronomy by the following astronomers of different foundations.

1981 Drs. M. Kontizas - Helen Livaniou-Rovithis, P. Niarchos, and E. Antonopoulou.

1982 Dr. P. Koubsky (Ondrejov Observatory) P. Niarchos, E. Antonopoulou, M. Kontizas, Helen Livaniou-Rovithis, E. Theodossiou, J. Dangee (Insbruck Observatory).

1983 Chr. Goudis, E. Antonopoulou, M. Kontizas, Helen Livaniou - Rovithis, J. Meaburn (Manchester University).

1984 Drs. M. Kontizas, E. Antonopoulou, P. Niarchos, Helen Livaniou-Rovithis.

1985 Drs. Chr. Goudis, E. Antonopoulou, M. Kontizas, Helen Livaniou-Rovithis.

1986 Drs. Chr. Goudis, P. Niarchos, M. Kontizas, Helen Livaniou-Rovithis.

INTERNATIONAL COOPERATION

Dr. Th. Prokakis worked at Stara Zagora on October 1983.

Dr. M. Gogoshev of Sofia University spent a week in Athens collaborating with Dr. Prokakis and G. Moraitis on February 1984.

Dr. E. Kontizas worked at the following foundations.

Edinburgh university -August - September 1980.

Trieste Observatory and University November 1881 - March 1982 - November 1983.

Trieste Observatory and Edinburgh Observatory, September 1984.

Universities of Marseille and Trieste, June 1985.

Trieste Observatory, September 1986.

Marseille University, October 1986.

Edinburgh Observatory, November 1986.

Dr. D. Dialetis worked at the following observatories:

Three months as assistant astronomer at Meudon Observatory (1981).

Two months at Meudon and Pic du Midi - Observatories (1984).

Two months at Meudon and Bagnères de Bigorre Observatories (1985).

Mr. Anastasios Dapergolas spent one month at Trieste Observatory on 1986.

Prof. C. J. Macris worked for two months at Meudon and Pic du Midi Observatory, 1985.

Technical works.

Mr. I. Zacharopoulos was responsible for the operation of the 1.20 m telescope in collaboration with Mr. G. Demou. Both carried out all the works as night assistants in the 120 cm telescope. Mr. John Zacharopoulos made all the provisions for Kryonerion Observatory.

Mr. Christos Bourdas carried out the technical work at the two Astronomical Centers of Penteli and Kryonerion.

N. Matsopoulos, Mr. Th. Varsos, Mrs. Kaliopi Klironomou, P. Vardaxoglou carried out the solar routine observations the photographic laboratory works and made the provisions for the Astronomical Center of Penteli.

Mrs. Th. Theofanous carried out all the work of secretariat of the Institute.

Thomas Varsos spent three months at the Laboratory of electronics of Democritos center on 1985.

Facilities 1981-1986

Dr. Th. Prokakis, has the supervision for the following:

1. Organization of a computer center at the Astronomical Center of Penteli.

2. Organization of a book binder's laboratory.

3. Organization of an electrocic laboratory.

Time service: Mr. D. Elias was responsible for all time routine works.

Meetings 1981-1986

The staff of the Observatory attended the following: Dr. C. Banos

1) XVII General Assembly of IAU Patras 1982.

2) XVIII meeting of the American Astronomical Society, Paris 1986.

3) 4th meeting of Hellenic Physical Society Athens 1986.

Dr. Th. Prokakis.

1) Meeting of maximum solar activity Simferopolis 1981.

2) XVIII General assembly of IAU, Patras 1982

3) Airglow and Solar Activity Stara Zagora, 1982.

- 4) 3rd meeting of Hellenic Physical Society, Athens 1986.
- 5) 4th meeting of solar Physics Leevenhorst 1984.
- 6) SMA workshop, Irkutsk, 1985
- 7) 8th meeting of Astronomical and Space, Lefkosa, 1985.
- 8) 4th meeting of Hellenic Physical Society, Athens, 1986.
- 9) European Regional Astronautics meeting of the IAU. Prague 1987.

Dr. E. Sarris

- 1) XVII General Assembly of IAU, Patras 1982.
- 2) 3th Meeting of Hellenic Physical Society, Kalamata, 1983.
- 3) 4th meeting of Hellenic Physical Society, Athens 1986.

Dr. P. Rovithis

1) NATO ADVANCED STUDY INSTITUTE ON THE ECLIPSING BINARIES Maratea, 1980.

- 2) XVII General Assembly of the IAU, Patras, 1982.
- 3) NATO A.S.I. on Interacting Binaries, Cambridge, England 25/7-5/8/1983.
- 4) 3th meeting of Hellenic Physical Society, Kalamata 1983.
- 5) Mediterranean School on Plasma Astrophysics, Colimbari, Crete 23/9-4/10/1985.

Dr. E. Kontizas

- 1) 11th Summer School of the IAU, Hvar
- 2) Meeting «Journées de Strasbourg», Strasbourg, 1982.
- 3) XVII General assembly of IAU, Patras 1982.
- 4) Workshop on «non thermal structure of stellar atmospheres and subatmospheres, Grado, Italy 1982.
- 5) IAU Colloquium No 78, Asiago, 1983.
- 6) Meeting at Trieste on «Influence of mass loss variability in velocity fields of stellar atmospheres, 1983.

7) Symposium No 116 of IAU, Porto-Helli, 1985.

Dr. D. Dialetis

- 1) XVII General Assembly of IAU, Patras 1982.
- 2) 8th European Regional Meeting of IAU, Toulouse 1984.
- 3) Physical Sciences in Greece, Larissa, 1985.
- 4) 4th meeting of Hellenic Physical Society, Athens 1986.

Dr. Georgia Tsiropoula

- 1) 2nd meeting of Hellenic Physical Society, 1981.
- 2) XVII General Assembly of IAU, Patras 1982.
- 3) 4th meeting of Hellenic Physical Society, Athens 1986.

Dr. Anast. Dapergolas

1) Symposium 116 of IAU, Porto-Helli, 1985.

Prof. Dr. C. J. Macris

- 1) Z. Meeting of Astronautical Society of Cyprus, Lemessos, Cyprus 1983.
- 2) 7th European Regional Meeting of I.A.U., Florence 1983.
- 3) 8th European Regional Meeting of I.A.U., Toulouse 1984.

4) Physical Sciences in Greece, Larissa 1985.

5) 4th meeting of Hellenic Physical Society, Athens 1986.

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Report 1987

Research

Night Astronomy

Dr. C. Banos continued the program of study of the atmosphere of Jupiter based on Voyager's data in collaboration with Dr. B. Petropoulos. He also worked on a program for searching periodicities of the activity of Jupiter in the period 1910-1985, in collaboration with Prof. Xanthakis and B. Petropoulos.

E. Sarris participated in the program of study of the activity on Jupiter. He also worked on the study of RR=Lyrae type stars. Dr. P. Rovithis continued the study of eclipsing binaries and diffused nebulae.

Dr. E. Kontizas begun a program «Luminous objects in nearby galaxies in collaboration with Prof. N. Nikolov to the University of Sofia. A new program «Atlas of spectra in Magellanic Clouds in collaboration with Prof. G. Sedmak, Dr. Pucillo, Dr. Pasion and Dr. Santini was accepted by the National Research Council of Italy.

He also submitted to the National Observatory of Athens a program observations of stellar systems for the earth and space and analysis of data » in collaboration with assist. Prof. M. Kontizas Dr. Anast. Depergolas, Prof. R. Stalio of the Trieste University and Dr. D. H. Morgan of Edinburgh

Observatory. Dr. Anast. Depergolas continued to work on the programs:

1) Study of stellar population in galaxies, in collaboration with assist. Prof. M. Kontizas.

2) Extragalactic astronomy in collaboration with Dr. E. Kontizas.

3) Procedure di simulazioni ed analisi di ammassi stelari e globulari «In collaboration with Trieste Observatory.

4) Study of stellar atmospheres, in collaboration with Dr. E. Kontizas. Solar Astronomy

Drs. C. Macris, Th. Prokakis and D. Dialetis: participated in the following programs:

1. Study of the variability of the morphological characteristics of the solar granulation with Dr. R. Muller.

2. Dr. Th. Prokakis worked on a program of spectroscopic study of solar radio bursts and their geophysical influence in collaboration with Dr. C. Caroulalos, G. Moraitis, C. Alissandrakis, Chr. Kouvelioti, M. Poqueruase, C. Perche and P. Crepels. He also participated in a program on the night sky refractor in two wavelengths with G. Moraitis and M. Gogoshev.

3. Dr. Dialetis worked on a program of study of the Evershed flow in the solar photosphere, chromosphere and chromosphere-corona transition region in collaboration with Dr. P. Mein, B. Schmieder, G. Simon and C. E. Alissandrakis.

Dr. Georgia Tsiropoula worked on a program of study of material motion in chromospheric structures in collaboration with Dr. C. Alissandrakis, P. Mein and N. Mein.

Observations

Night Astronomy

Drs. C. Banos, E. Sarris, P. Rovithis, E. Kontizas and Dr. An. Dapergolas continued the observations of planets, eclipsing binaries, early type stars with the 1.2 m telescope of Kryonerion Astronomical Center. The electronician and night assistants Mrs J. Zacharopoulos and G. Demou carried out the programs of night observations.

Prof. Ch. Goudis, assist. Prof. P. Niarchos, Helen Livaniou-Rovithis and M. Kontizas, continued their programs at the 1.2 m. telescope.

Solar Astronomy

Routine solar observations were carried out by the technicians Mr. Th. Varsos, Kal. Klironomou and P. Vardaxoglou.

Time Service

Routine work carried out by the technicians Mr. Th. Varsos Kal. Klironomou and P. Vardaxoglou.

Workshop

J. Zacharopoulos and G. Demou carried out all the electronic work of the 1.2 m telescope and made the aluminization of the 1.2 m telescope in collaboration with Mr. Chr. Bourdas.

International Cooperation

Dr. E. Kontizas was invited and gave a lecture in the Summer School organized the department of Physics of the University of Crete. He also spent one month in Trieste Observatory and gave a lecture on «The Evershed flow». Prof. Dr. C.J. Macris, Director of the Astronomical Institute worked two weeks at the Meudon and Geneva Observatories.

Meetings

Dr. Th. Prokakis, E. Sarris, E. Kontizas, P. Rovithis and G. Tsiropoula attended the 10th European Regional Meeting of IAU in Prague. Dr. G. Tsiropoula attended the Workshop of Dynamics and structure of solar prominences, Palma di Mallorca.

Publications

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2. Alissandrakis C., Dialetis D., and Tsiropoula G. (1987) «On the determination of mean lifetime of solar Features A & A 174, 275.
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Report 1988

Research

Solar Astronomy

The Director of the Astronomical Institute Prof. C. Macris and Dr. D.

Dialetis, Dr. Th. Prokakis and Mr. N. Matsopoulos continued the program of the variability of the morphological characteristics of the solar granulation with Dr. R. Muller of the Pic du Midi Observatory.

Dr. D. Dialetis continued the program of study of the Evershed flow in the solar photosphere, chromosphere and chromosphere-corona transition regions, in collaboration with the French solar physicists of the Meudon Observatory.

Night Astronomy

Dr. C. Banos in collaboration with Prof. J. Xanthakis and B. Petropoulos, continued the program of study of the planet Jupiter. Dr. E. Sarris participated in the program of study of the activity of Jupiter.

Dr. E. Kontizas continued the program «Luminous objective in nearby galaxies» and the program «Atlas of Spectra in Magellanic Clouds».

Dr. P. Rovithis continued the study of eclipsing binaries and diffused nebulae.

Dr. A. Dapergolas continued to work on the program «Study of stellar population in galaxies» and in Extragalactic Astronomy.

Observations

Solar Astronomy

Routine solar observations were carried out by the technicians Mrs. Th. Varsos, P. Vardaxoglou, C. Kotzias and Miss Koumentakou.

Mr. N. Matsopoulos worked under the supervision of Prof. Macris for the installment of the triple solar telescope and of the Link photometer at the Larissa Observatory in collaboration with Mr. Ch. Bourdas.

Time Service

Routine work was carried out by the technicians of the Astronomical Institute.

Workshop

Mr. J. Zacharopoulos and G. Demou carried out all the electronic work of the 1.2 m. telescope and made the aluminization of the 1.2 m. telescope mirror in collaboration with Mr. Chr. Bourdas.

Meetings

Dr. C. Banos attended the 20th General Assembly of I.A.U. (1988) Baltimore U.S.A.

Prof. C. Macris and the scientist of the Astronomical Institute attended the workshop «Solar and Space Physics in Greece today - possibilities and perspectives».

Dr. A. Dapergolas attended the 3rd ESO/CERN Symposium, May 1988, Bologna - Italy.

Prof. C. Macris and Drs D. Dialetis and Th. Prokakis attended the workshop «Solar and Stellar Granulation» Third International Workshop of the OAC - NATO Advanced Research Workshop. Capri, Italy, June 21-25 1988.

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11) Προκάκης Θ.: «Σύγχρονες τάσεις στην ηλιακή παρατήρηση». πρακτικά Συμποσίου «Ηλιακή και διαστημική φυσική στην Ελλάδα σήμερα» Ιούνιος 1988 (υπό έκδοση).

12) Προκάκης Θ., και Μακρής Κ.: «Προκαταρκτική μελέτη τόπου για την εγκατάσταση ηλιακού Αστεροσκοπίου στην Κύπρο. Δημοσιεύσεις ΕΑΑ/Αστρον. Ινστ. / Σειρά II.

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Magellanic Cloud (SMC)» 1988, Διδακτορική Διατριβή, Πανεπιστήμιο Αθήνας.

17) Dapergolas A., Kontizas E. and Kontizas M.: «1988BV Photoelectric Observations of GG Cyg» 1988, Inf. Bull. Var. Stars, No 3249.

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25) Hantzios, P.A.: «S-Waves in the Spectra of Cataclysmic Binaries» 1988, P.A.S.P. 100, 1188.

26) Μακρής Κ., Ματσόπουλος Ν. «Οι απόψεις του Κοσμά Μπαλάνου επί του ημερολογιακού Προβλήματος. Ανακοίνωση στο συνέδριο «Οι θετικές επιστήμες στην περίοδο του Νεοελληνικού διαφωτισμού». Λάρισα 22, 23, 24 Απριλίου 1988.

27) Διαλέτης Δ., και Ματσόπουλος Ν. «Ορισμένες πλευρές της κοσμολογικής θεώρησης του Ευγενίου Βουλγάρεως. Ανακοίνωση στο συνέδριο «Οι θετικές επιστήμες στην περίοδο του Νεοελληνικού διαφωτισμού». Λάρισα 22, 23, 24 Απριλίου 1988.

28) Ματσόπουλος Ν., Βάρσος Θ. «Solar activity (1976-1986). Ανακοίνωση στο Συμπόσιο με τίτλο «Ηλιακή και διαστημική έρευνα στην Ελλάδα σήμερα. Δυνατότητες και προοπτικές. Αστεροσκοπείο Πεντέλης 1-3 Ιουνίου 1988.

Report 1989

Research

The resercher of the astronomical Institute continued the scientific programs cited in the annual report of the year 1988.

International Cooperation - Meetings

Dr. D. Dialetis worked as assistant astronomer for a month (January - February) at the Meudon Observatory.

Dr. E. Kontizas was appointed for a six months period as Senior Research

Associate at NASA/GSFC.

The staff of the Observatory attended the following meetings:

Dr. C. Banos.

International Symposium of CIVES on the Phobos - Mars mission, paris 23 - 27, October 1989.

Dr. D. Dialetis

«Magnetisme dans les étoiles du type solaire «Ecole Normale Supérieure, Paris 9-10, Fevrier 1989.

Dr. E. Rovithis

NATO - ASI Workshop, Kusantassi, Turkey, 12 - 13 September 1989.

Mr. N. Matsopoulos 1st JOSO WG5, Workshop in «Solar Variability», Roma 7-8 November 1989.

All the researchers of the Astronomical Institute attended the 5th Meeting of Hellenic Physical Society, Athens, December 1989.

PUBLICATIONS

1) Macris C., Prokakis Th., Dialetis D., Muller R.: «The Variation of the Mean Size of the Photospheric Granules Close to and Away from a Sunspot». 1989, Solar Physics, 122, 209.

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5) Νικολαΐδης Ε., Διαλέτης Δ.: «Η Γαλλική Επανάσταση και οι θετικές επιστήμες στην Ελλάδα» 1989, ανακοίνωση στο Ελληνογαλλικό τριήμερο του Γαλλικού Ινστιτούτου Θεσσαλονίκης και του Ομίλου για την Ιστορία των Μαθηματικών με θέμα «Η αναμορφωτική επίδραση της Γαλλικής Επανάστασης στα Μαθηματικά και ο Ελληνικός Απόηχος», Θεσσαλονίκη, 8-10 Νοεμβρίου 89.

6) Διαλέτης Δ., Νικολαΐδης Ε.: «Οι Γαλλικές Επιδράσεις στις Ελληνικές θετικές Επιστήμες στα τέλη του 18ου αιώνα» 1989, ανακοίνωση στο 5ο Πανελλήνιο Συνέδριο Φυσικής, Αθήνα, 16-20 Δεκεμβρίου 89.

7) Προκάκης Θ., Μακρής Κ. «Μέθοδος υπολογισμού του ύψους πύργου γιά την εγκατάσταση ηλιακού Αστεροσκοπείου» 1989, Συνέδριο Εν. Ελλήνων Φυσικών Δεκ. 1989 (υπό έκδοση).

8) Προκάκης Θ.: «Παρατήρηση ηλιακής χρωμόσφαιρας με αυτόματο σύστημα» 1989, Συνέδριο Ένωσης Ελλήνων Φυσικών Δεκ. 1989 (υπό έκδοση).

9) Ματσόπουλος Ν., Γραμμένος Θ.: «Εκλαΐκευση της Αστρονομίας στην Ελλάδα» Ε' Συνέδριο Φυσικής, Δεκέμβριος 1989, Αθήνα.

- 10) Μακρής Κ., Ματσόπουλος Ν. : «Η επίδραση της μεταβλητότητας της Φωτοσφαιρικής Κοκκίωσης στην Ραδιοεκπομπή του ήρεμου Ηλίου στα εκατοστομετρικά κύματα. Ε' Συνέδριο Φυσικής Δεκέμβριος 1989, Αθήνα.
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The Director
of the Astronomical Institute
Prof. Dr. C. J. MACRIS

SECTION OF ASTROPHYSICS, ASTRONOMY AND MECHANICS
DEPARTMENT OF PHYSICS FACULTY OF SCIENCE

NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

1981 - 1989

Staff: Professor Dr. S.N. Svolopoulos has been Director of the Section until March 1st, 1986 when Assoc. Professor Dr. P.G. Laskarides was elected in this position. He was reelected for 1987-88 and 1988-89. Professor Dr. G. Contopoulos was elected Director for 1989-90 and Assoc. Professor Dr. P.G. Laskarides Chairman of the Department of Physics for the same year.

The staff of the Section during these years consisted of Professor G. Contopoulos, Assoc. Professor P. Laskarides, Assistant Professors D. Papathanasoglou, H. Livaniou - Rovithis, J. Constantopoulos, M. Arzoglou - Kontizas, X. Moussas, P. Niarchos, C. Alissandrakis, A. Pinotsis, E. Antonopoulou - Charalambopoulou, Th. Papayannopoulos, M. Tsampanlis, E. Theodossiou, E. Danezis, Ph. Papaclias, C. Kouveliotou, P. Preka - Papadema, Lectures N. Voglis, Ch. Polimilis and Assistants J. Deliyannis and M. Stathopoulou.

Professor S. Svolopoulos retired in 1987 and was awarded the title of Professor Emeritus.

Lecturer Dr. M. Petrou - Palmer resigned on Dec. 31st, 1986.

Professor G. Papadopoulos and Assistant Professors G. Constantelos and J. Hadjiagapiou left the Section during 1987.

At the end of 1989 the following 24 graduates worked towards a Doctors Degree under the supervision of the staff of the Section: J. Bamias, E. Chaliassos, M. Stathopoulou, J. Deliyannis, P. Patsis, D. Nicolaidis, M. Andrakakou, M. Metaxa, E. Saridakis, E. Eleftheriou, A. Hillaris, A. Kaskambas, M. Chrysosvergis, E. Xiradaki, A. Georgakilas, M. Garyfalas, E. Frangou, G. Mitsionis, A. Theodossiou, S. Argyropoulos, N. Mantzakouras, A. Pitsavas, S. Maravelias and A. Kalimeris.

The scientific interests of the Section were recognised as follows:

Cosmology - Relativity (G. Contopoulos, M. Tsampanlis, J. Bamias and E. Chaliassos)

Dynamical Astronomy (G. Contopoulos, T. Papayannopoulos, N. Voglis, N. Hiotelis, L. Zahilas and J. Seimenis)

Structure and Evolution of the Stars (P. Laskarides and D. Nicolaidis)

Extragalactic Astronomy (M. Kontizas, M. Metaxa, M. Chrysosvergis, E. Xiradaki and S. Argyropoulos)

Spectroscopy (IR, V, UV, X, Radio and γ) (P. Laskarides, E. Antonopoulou, E. Theodossiou, E. Danezis, C. Kouveliotou)

Double and Variable Stars (H. Livaniou - Rovithis, P. Niarchos, P.

Laskarides, E. Antonopoulou, E. Theodossiou, E. Danezis, A. Kaskambas)
Solar Physics (C. Alissandrakis, D. Papathanasoglou, J. Deliyannis, P. Preka - Papadema, M. Stathopoulou, A. Hillaris, A. Georgakilas, M. Garyfalas, E. Frangou)

Space Physics (X. Moussas, G. Mitsionis, A. Theodossiou)

High Energy Astrophysics (C. Kouveliotou, Ph. Papaclias)

Statistical Mechanics (J. Constantopoulos)

Analytical mechanics

Plasma Physics and Application in Astrophysics (C. Alissandrakis)

Applied Optics (D. Papathanasoglou)

Non - linear Dynamics (G. Contopoulos, C. Polimilis)

Applications of Solar Energy in Agriculture (M. Tsampanlis)

Antimatter Meteorites (Ph. Papaclias)

Interstellar Matter (S. Svolopoulos)

Publications:

Part A

**Publications in International Journals
and Invited lectures in International Meetings**

1. Alissandrakis, C.E., 1980: «Active Region Magnetic Fields and cm - λ Emission» in M.R. Kundu and J.E. Gergely (eds), «Radio Physics of the Sun» p. 101.
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4. Alissandrakis, C.E. and Kundu, M.R. 1982: «Observations of Ring Structure in a Sunspot Associated Source at 6 Centimeter Wavelength», Astrophys. J. 253, 149.
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Part C

Books and Lecture Notes

1. Alissandrakis, C.E. 1984: «Introduction to Plasma Physics» Lecture Notes

(in Greek)

2. G. Contopoulos and D. Kotsakis 1986: «Cosmology», Textbook in Greek, translated in English by P. Palmer and M. Petrou, Springer Verlag.
3. Kontiza, M., Danezis, E., Deliyannis, I., Theodossiou, E. Moussas, X. and Pinotsis, A. 1986: «Introduction to Astrophysics», Athens (notes for the students in Greek).
4. Kontizas, M., Danezis, E. and Kouveliotou, C. 1984: «Laboratory Exercises in Astrophysics», Athens (in Greek).
5. Kontizas, M. and Antonopoulou, E. 1988: «Astrophysics II», Lecture Notes, Athens.
6. Laskarides, P. and Niarchos, P. 1980: «Laboratory Exercises in Astronomy», University of Athens Edition, pp. 159. (in Greek).
7. Laskarides, P. 1985: «Notes in Astronomy II», pp. 120 (in Greek).
8. Livanou-Rovithis, H. and Niarchos, P.G. 1987: «Notes in Observational Astrophysics», pp. 112. Athens (in Greek).
9. Livanou-Rovithis, H., Niarchos, P.G., Papagiannopoulos, T. and Papathanasoglou, D. 1986: «Notes in Astronomy I», pp. 200, Athens (in Greek).
10. Papathanasoglou, D. 1986: «Applied Optics» Notes for the students, Athens, (in Greek).
11. Svolopoulos, S.N. 1983: «Lectures in Astrophysics», University of Athens Edition (in Greek).
12. Papaelias, P. 1988: «High Energy Astrophysics», Lecture Notes (in Greek).
13. Pinotsis, A. 1989: «Lecture Notes in Cosmology» (in Greek).

Part D

Theses and Dissertations

1. Antonopoulou, E. 1981: «Binary Systems in the Infrared», Ph. D. Thesis, Edinburgh University.
2. Livanou-Rovithis, H. 1982: «A Study of Photometric Perturbations in close Binary stars». Docent's Dissertation, University of Athens (in Greek).
3. Niarchos, P.G. 1982: «A photometric Study of AH Virginis and VW Cephei type eclipsing binary systems» Docent's Dissertation. University of Athens (in Greek).
4. Papaelias, P. 1984: «A Study of the atom-antimatter annihilation cross-section and of the behaviour of antimatter meteors in the Earth atmosphere». Doctorat Thesis, University of Athens (in Greek).
5. Petrou, M. 1981: «Dynamical Models of spheroidal systems», Ph. D. Thesis, University of Cambridge, England.
6. Pinotsis, A. 1980: «Open Clusters isochrones with variable gravitational constant», Doctorat Thesis, University of Athens (in Greek).

7. Polymilis, C. 1984: «Approximations of the 3-particle Toda Lattice», Doctorat Thesis, University of Athens (in Greek).
8. Preka, P. 1985: «Centimetric Wavelengths from flare loops in the lower Solar corona», Doctorat Thesis, University of Athens (in Greek).
9. Voglis, N. 1984: «Evolution of the density perturbations in the Universe» Doctorat Thesis, University of Athens (in Greek).
10. Zachilas, L. 1988: «Numerical and Theoretical study of 3-Dimensional systems» Doctorat Thesis, University of Athens (in Greek).
11. Hiotelis N. 1989: «The Growth of Angular Momentum in Galaxies», Doctorat Thesis, Univ. of Athens, 1989 (in Greek).

PARTE

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4. Laskarides, P.G. and Andrakakou, M.A. «Wavelength Standards for the Radial Velocity Measurements», 171 (in English).
5. Livaniou-Rovithis, H. «Period Changes in Eclipsing Binary Systems» 177 (in Greek).
6. Moussas, X. «Comet plasma Environment», 211 (in Greek)
7. Niarchos, P.G. «Photometric Analysis of the Light Curves of Eclipsing Variable Stars» 235 (in Greek)
8. Papayannopoulos, T. «The Role of Resonant Orbits in the Dynamic of Bar Galaxies», 265 (in Greek)
9. Petropoulos, B. and Georgakilas, A. «The Atmosphere of Titan», 295 (in Greek).
10. Pinotsis, A.D. «Instabilities and Bifurcations in Dynamical systems of 1,2 and 3 degrees of Freedom», 307 (in Greek).
11. Preka-Papadema, P. «Rings in the Solar System», 321 (in Greek)
12. Svolopoulos, S.N. «The Bipolar Nebulae», 361 (in Greek)

Part E

Abstracts of papers presented in Greek in Panhellenic Meetings of the Greek Union of Physics

1. Alissandrakis, K., Dialetis, D., Preka, P. and Prokakis, T., 1981: «The Flare of July 10th, 1978», 2nd Meeting, Calamata.
2. Alissandrakis K.E., Antoniou, N., Glezos, N., Koutroumanou, E. and

Mpouritsas, G. 1981: «Graduate Studies in Greece», 2nd Meeting

3. Banos, G. and Alissandrakis, C.E. 1981, «Greek Research Activity in the fields of Astronomy, Plasma Physics and Space Physics», 2nd m.

4. Chrysovergis, M., Kontizas, M. and Kontizas E., 1986: «Mass distribution in the clusters of LMC», 4th Meeting.

5. Dialetis, D., Kontizas E., Kontizas M. and Prokakis, T. 1983: «A method for the determination of the apparent ellipticity of globular clusters from photographic plates», 2nd Meeting.

6. Kontizas M., and Kontizas E., 1981: «Radial Velocities of hydrogen lines of early type supergiants» Meeting in Mytilini.

7. Kontizas, E., Dapergolas, A. and Kontizas, M., 1986: «Age and stellar evolution of the clusters in galaxies SMC and LMC», 4th Meeting.

8. Xiradaki, E. Kontizas, E. and Kontizas, M. 1986: «Spectral Classification of the stars in the clusters of LMC», 4th Meeting.

9. Pinotsis, A. 1980: «A test of the Brans-Dicke cosmological theory from the stellar evolution», 2nd Meeting.

10. Pinotsis, A. 1983: «Bifurcations of simple periodic orbits around the two primary bodies in the restricted three-body problem», 3rd Meeting.

Part G

Different Publications in Greek

1. Alissandrakis, K.E. 1986: «The Syllabus of the Course of Cosmography» Symposium «School and Ideology», Publ. Synchroni Epochi, p. 198.
2. Antonopoulou, E. and Theodosiou, E. 1985: «Wolf-Rayet Stars» Physical World.
3. Constantopoulos, J. 1981: «Hertz's Mechanics and the meaning of the Interaction», Deukaleon, no 35 p.201.
4. Kontizas, M. and Kontizas, E. 1981: «Description and performance of the Photographic Camera for the 1.2m Kryonerion Telescope», Memoirs of the National Observatory of Athens, Ser. 1, No 19.
5. Kontizas, E., Smyth, M.J., Theodossiou, E. and Kontizas, M. 1983: «Computer controlled spectrum scanner for the 1.2m Kryonerion Telescope», Memoirs of the National Observatory of Athens, 11, No 27.
6. Moussas, X. 1981: «Problems in Space Physics», Themelia ton Epistimon, Gutenberg 3, p. 69.
7. Papathanasoglou D., and Deliyannis, J. 1980: «The determination of the structural data of the Newall telescope objective with the use of the laser». Technical Annals, 4, Athens.
8. Papathanasoglou, D., Deliyannis, J. and Stathopoulou, M. 1980: «Determination of the times of contacts in the annual solar eclipse of April 29th, 1976», Proceedings National Academy of Athens 55, 336.
9. Papathanasoglou D., and Deliyannis, J. 1982: «Chromatic aberration of a

refractor and its influence on the observations applied to the Newall's and Doride's refractors of the national Observatory of Athens», Publications of the N.O.A., No 20.

10. Pinotsis, A. 1980: «The expansion of the Universe and the cosmological Theories», Bulletin Geogr. Serv. of the Army, 118, 85.

11. Pinotsis, A. 1980: «Energy Generation in stellar (solar) interiors» Technical Annals, 3, 82.

12. Pinotsis, A. 1983: «Changes in the chemical constitution of stars» Technical Annals, 3, 45.

13. Pinotsis, A. 1983: «Bifurcations of simple and multiple periodic orbits a-b and q-i in the restricted three body problem». Proceedings of the Meeting of Theoretical - Applied Mechanics p. 247, (Abstract).

14. Pinotsis, A. 1987: «The Climate of Dodecanesos and especialy of the island of Symi» presented in the 5th Scientific Meeting of Dodecanesos, Nisyros.

15. Polymilis, C. 1981: «Noise pollution», Inform. Bull. E.M.P., ser.9

16. Polymilis, C. 1981: «Methods for noise determination», Technical Annals, 1/1-2.

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18. Preka, P. 1980: «Mars», Physical World, 73, 4.

19. Vlachos, L. and Alissandrakis, K., 1984: «Current Problems in Solar Plasma Physics», Physical Review, no. 9, p.10.

Paul G. Laskarides
Associate Professor
Director of the Section 1986-89

ARISTOTELEION UNIVERSITY OF THESSALONIKI DEPARTMENT OF PHYSICS

SECTION OF ASTROPHYSICS, ASTRONOMY AND MECHANICS

ACTIVITIES IN ASTRONOMY 1981-1989

1981 - Department of Astronomy

Staff

Dr. B. Xanthopoulos was an Invited Scientist at the Max-Planck-Institut für Astrophysik from June to August 1981.

Dr. H. Varvoglis continued as Post-Doctor at the University of Maryland with leave of absence from the University of Thessaloniki.

Mr. D. Papadopoulos continued as Post-Doctor at the University of Cincinnati with leave of absence from the University of Thessaloniki.

Thus the staff of the Department at the end of 1981 was as follows:

1) Dr. B. Barbanis, Professor, 2) Dr. S. Persides, Assistant Professor, 3) Dr. N. Spyrou, Dozent with Teaching Assignment, 4) Dr. B. Xanthopoulos and Dr. Ch. Terzides, Chief Assistants, 5) Dr. H. Varvoglis, Mr. D. Papadopoulos, Mr N. Caranicolas and Mr. S. Avgoloupis, Assistants, 6) Mrs F. Papageorgiou and Mrs K. Vassiliadis, Secretaries, and 7) Mr. K. Papadopoulos, Technician.

Publications

1. B. Barbanis: «The Behaviour of Adiabatic Invariants near Resonances» in Honorem I. Xanthakis, Reidel Publishing Co., 31-42, 1981.

2. S. Persides: «Classical Phase Space from a Relativistic Point of View» in Honorem I. Xantakis, Reidel Publishing Co., 361-371, 1981.

3. N. Spyrou: «Relativistic Celestial Mechanics of Binary Stars», Gen. Rel. Grav. 13, 473-485, 1981.

4. N. Spyrou: «Relativistic Effects in Many-Body Systems of Finite Size, Internal Structure and Internal Motions. II. The Determination of the Inertial and Rest Masses of Binary Stars», Gen. Rel. Grav., 13, 487-493, 1981.

5. A. Caporali and N. Spyrou: «Post-Newtonian Spin and Angular Momentum of Bounded Systems» Gen. Rel. Grav., 13, 689-701, 1981.

6. N. Spyrou: «The Far Field of a Gravitating Source in Relation to its Interior» Gen. Rel. Grav., 13, 551-559, 1981.

7. N. Spyrou: «Perfect Fluids as Possible Sources of the Kerr metric» Gen. Rel. Grav., 13, 771, 1981.

8. Ch. Terzides: «The dynamical contribution of the halo mass to the Spiral Structure», Sci. Annals, Fac. Phys. and Math. Univ. Thessaloniki, 20a, 27, 1980.

9. Ch. Terzides: «Limits of the Halo Component in Spiral Galaxies» Astron. Astrophys., 99, 144-151, 1981.

10.B. Xanthopoulos: «Gribov vacua and Einstein spacetimes», Phys. Lett. B, 98, 377, 1981.

11.B. Xanthopoulos: «Harmonic maps and self-dual SU (3) gauge fields», J. Phys. A., Math. Gen., 14, 1445, 1981.

12.B. Xanthopoulos: «Reducible systems of linear differential equations», Proc. R. Soc. Lond., A378, 61, 1981.

13.B. Xanthopoulos: «Exterior spacetimes for rotating stars», J. Math. Phys., 22, 1254, 1981.

14.B. Xanthopoulos: «Metric and electromagnetic perturbations of the Reissner-Nordström black hole», Proc. R. Soc. Lond., A 378, 73, 1981.

Meetings

B. Xanthopoulos participated in (i) The International Symposium in memory of Werner Heisenberg on «Unified Theories of Elementary Particles» held at the Max-Planck-Institut, Munich, from July 16 to 21, 1981. (ii) The VIth International Conference on Mathematical Physics held at the Freie Universität, Berlin from August 11 to 20, 1981. The paper «A completely integrable system for the SU (3) Yang-Mills equations» was presented in the meeting at Berlin.

1982-Department of Astronomy

Staff

Dr. N. Spyrou was appointed as Assistant Professor in September.

Dr. B. Xanthopoulos left the Department in October 1982 with leave of absence to the University of Crete.

Dr. H. Varvoglis returned from his leave of absence to the University of Maryland, U.S.A.

Dr. D. Papadopoulos received his Ph. D. in May after returning from his leave of absence to the University of Cincinnati, U.S.A.

N. Caranicolas, D. Papadopoulos, Ch. Terzides, H. Varvoglis were appointed as Lecturers in August.

Mr. K. Kokkotas was appointed Scientific Collaborator.

Thus the staff of the Department at the end of 1982 was as follows:

1) Dr. B. Barbanis, Professor, 2) Dr. S. Persides and Dr. N. Spyrou, Assistant Professors, 3) Dr. N. Caranicolas, Dr. D. Papadopoulos, Dr. Ch. Terzides and Dr. H. Varvoglis, Lecturers, 4) Mr. S. Avgoloupis, Assistant, 5) Mr. K. Kokkotas, Scientific Collaborator, 6) Mrs. F. Papageorgiou and Mrs. K. Vasiliadis Secretaries, and 7) Mr. K. Papadopoulos, Technician.

Publications

1. S. Avgoloupis, G. Asteriadis, L.N. Mavridis, P. Varvoglis: «Photoelectric Observations of the Flare BY Dra in 1981» Commission 27 of the IAU, Information Bulletin on Variable Stars No. 2210, 1982.

2. N. Caranicolas and B. Barbanis: «Orbits in Nearly Axisymmetric Stellar Systems», Astr. Astrophys., 114, 360, 1982.

3. N. Caranicolas: «Characteristics of Resonance Periodic Orbits»,

Astrophysics and Space Science, 87, 245, 1982.

4. D. Papadopoulos and L. Witten: «Static Axisymmetric Solution of the Einstein Equations», Phys. Rev. D., 25, 1465, 1982.

5. D. Papadopoulos and F. Paul Esposito: «Relativistic Hydromagnetic Wave Propagation and Instability in Anisotropic Universe», Ap. J., 257, 10, 1982.

6. D. Papadopoulos and L. Witten: «Generating Solution of Self-Dual SU (3) Gauge Fields», Phys. Rev. D., 26, 3738, 1982.

7. S. Persides: «Timelike Infinity», Journal of Mathematical Physics, 23, 283, 1982.

8. S. Persides: «A Unified Formulation of Timelike, Null and Spatial Infinity», Journal of Mathematical Physics, 23, 289, 1982.

9. S. Persides: «Some Recent Developments in Asymptotic Structure», Proceedings of the Second Marcel Grossmann Meeting of General Relativity, R. Ruffini (ed.), North - Holland, Amsterdam, 1982.

10.N.Spyrou and H. Varvoglis: «On a New Integral of Motion in Relativistic Galactic Dynamics», Astrophys. J., 255, 674, 1982.

11.N. Spyrou: «Reversible Transformations of Shapes and Sizes of Uncharged Ergospheres», Journal of Physics A.15, 1979, 1982.

12.B.W. Steward, D. Papadopoulos, L. Witten, R. Beresdivin and L. Herrera: «An Interior Solution for the Gamma Metric», Gen. Rel. Grav., 14, 97, 1982.

13.Ch. Terzides: «Density wave theory of spiral structure», (in Greek), Tech. Chron., 1982, Section B, 2, No. 1-2, 73-94.

14.Ch.Terzides: «On the propagation of density waves in a spiral galaxy», Astrophysics and Space Science, 81, 345-355, 1982.

15.B. Xanthopoulos: «A Completely Integrable System for the SU (3) Yang - Mills Equations», J. Phys. A: Math. Gen., 15, L61, 1982.

16.B. Xanthopoulos: «Killing Pairs and Newtonian Integrals of Motion», Lett. in Math. Phys. 6, 199, 1982.

17.B. Xanthopoulos: «Axially symmetric, static, self-dual SU (3) gauge fields and stationary Einstein Maxwell metrics, with M. Gürses, Phys. Rev. D., 26, 1912, 1982.

Meetings

B. Barbanis, B. Xanthopoulos, N. Caranicolas and S. Avgoloupis attended the XVIII General Assembly of the IAU held in Patras from 17 to 26 August 1982.

B. Barbanis and Ch. Terzides attended the IAU Colloquium No. 74: Dynamical Trapping and Evolution in the Solar System, Halkidiki, August 30 to September 2, 1982.

N. Spyrou participated in the IAU Symposium No. 104: Early Evolution of the Universe and its Present Structure held at Crete, Greece from August 30 to September 2, 1982, where he presented results of his work on the possibility of

continuing contraction of collapsed objects.

B. Xanthopoulos participated in the IAU Symposium No. 104 at Crete, Greece, August 30-September 2, 1982, where he presented his work on Spherical and Toroidal Black Holes.

N. Caranicolas participated in the Colloquium No 74 of the IAU held in Halkidiki where he presented results of his work on periodic orbits in highly perturbed dynamical systems.

H. Varvoglis participated in the following meetings:

a) «Dynamic Days», held in La Jolla, California from 4 to 6 January 1982, where he presented results of his work on the chaotic motion of ions in plasma waves. b) American Geophysical Union Spring Meeting held in Philadelphia, Pennsylvania, from May 31 to June 4, 1982 where he presented results of his work on ion energization by electromagnetic plasma waves. c) XVII General Assembly of the IAU held in Patras, Greece from 17 to 26 August 1982, where he presented his work on ion preacceleration in solar flares. d) Colloquium No. 74 of the IAU held in Halkidiki, Greece from August 30 to September 2, where he presented results of his work on the onset of chaotic motion in dynamical systems.

K. Kokkotas attended the IAU Symposium 104 at Crete, Greece, from August 30 to September 2, 1982.

Due to the reorganization of Greek Universities at the end of 1982, the Department of Astronomy (A), and the Department of Theoretical Mechanics (M) were merged into the Section of Astrophysics, Astronomy and Mechanics (AAM) of the Department of Physics.

1983 - Section of Astrophysics, Astronomy and Mechanics:

Staff

In June, Dr. N. Spyrou was appointed as Associate Professor.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1983 was as follows:

Professors: B. Barbanis (A), G. Bozis(M), J. Hadjidemetriou (M).

Associate Professors: M. Michalodimitrakis(M), S. Persides(A), N. Spyrou(A).

Assistant Professors: S. Ichtiaroglou (M), D. Papadopoulos(A), H. Varvoglis(A).

Lecturers: N. Caranicolas(A), Th. Christidis (M), K. Katopodis (M), Ch. Terzides(A), G. Tsarouhas(M).

Assistants: S. Avgoloupis(A), Mr. F. Grigorelis (M).

Scientific Collaborators: Mr. K. Kokkotas (A).

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mr. K. Papadopoulos, Mrs F. Papageorgiou, Mrs. K. Vassiliadis.

Publications

1. Asteriadis G., Avgoloupis S., Mavridis L.N. and Varvoglis P.: «Photoelectric observations of the Flare Star EV Lac in 1980», *Comm.27 IAU Inf. Bull. Variable Stars*, 2408, 1983.

2. Caranicolas N.: «Characteristics of Periodic Orbits in Elliptical Galaxies», *Dynamical Trapping and Evolution in the Solar System*, (eds): V.V. Markellos and Y. Kozai, 1983.

3. Caranicolas N. and Marapoulou J.: «Bifurcations of Periodic Orbits in a Rotating Galaxy», *Astrophys. and Space Sc.*, 96, 375-380, 1983.

4. Papadopoulos D., Tuan T.F., Peterson A.W. and Nadile R.W.: «A generalization of the Hines' Dispersion Relation», *Adv. Space Res.*, 3, No. 1, 37-41, 1983.

5. Spyrou N. and Papadopoulos D.: «Post-Newtonian Gravitational Radiation from Binary Stars», *M.P.A.*, 83, 2-23, 1983.

6. N. Spyrou: «Possible Contraction of the Members of the Binary Pulsar PSR 1913+16 and its Astrophysical Consequences», *Early Evolution of the Universe and its Present Structure*, (eds): G.O. Abell and Chincarini, 1983.

7. Spyrou N.: «Relativistic Conic Sections», *Gen. Rel. Grav.*, 15, 363-374, 1983.

8. Tuan T.F., Papadopoulos D., Peterson A.W. and Nadile R.W.: «Analysis of Gravity-wave induced Instabilities and Turbulence viscosity Parameters from Optical Emissions», *Adv. Space Res.*, 2, No 10, 137-141, 1983.

9. Varvoglis H.: «Degenerate Dynamical Systems and the Disappearance of (K.A.M. type) Integrals of Motion», *Dynamical Trapping and Evolution in the Solar System*, 411-415, 1983.

10. H. Varvoglis and K. Papadopoulos: «Selective nonresonant acceleration of $^3\text{He}^{++}$ and heavy ions by H^+ cyclotron waves», *Astrophys. J. Letters*, 270, L95, 1983.

Meetings - International Scientific Collaborations

D. Papadopoulos participated in the International Meeting of General Relativistic Theory at Mallorca, Spain, 1983.

H. Varvoglis participated in the 7th European Astronomy Meeting, at Florence, Italy, 1983, where he announced the paper «Effects of the Internal Characteristics of the Nucleus of an Elliptical Galaxy in the motions of its stars», which has been written jointly with N. Spyrou.

B. Barbanis continued his research activities at the European Southern Observatory, Garching, München, W. Germany, during the periods from Feb. 8, to Feb. 20, 1983 and from Aug. 1 to Aug. 31, 1983.

N. Spyrou, as a DAAD Scholar, performed research work at the Max-Planck-Institut für Astrophysik, München, W. Germany during the period July 1983 to October 1983.

1984 - Section of Astrophysics, Astronomy and Mechanics

Staff

Dr. S. Avgoloupis received his Ph. D. in June and was appointed as Lecturer.

Mr. K. Kokkotas continues as a postgraduate student at the University College, Cardiff University, Wales with one year leave of absence from the University of Thessaloniki.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1984 was as follows:

Professors: B. Barbanis(A), G. Bozis(M), J. Hadjidemetriou(M).

Associate Professors: M. Michalodimitrakis(M), S. Persides(A), N. Spyrou(A).

Assistant Professors: S. Ichtiaroglou (M), D. Papadopoulos(A), H. Varvoglis(A).

Lecturers: S. Avgoloupis(A), N. Caranicolas(A), Th. Christidis(M), K. Katopodis(M), Ch. Terzides(A), G. Tsarouhas (M).

Assistants: Mr. F. Grigorelis(M).

Scientific Collaborators: Mr. K. Kokkotas(A).

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mr. K. Papadopoulos, Mrs. F. Papageorgiou, Mrs. K. Vassiliadis.

Publications

1. Σ. Αυγολούπης: Συμβολή στη μελέτη των μεταβολών μακράς διάρκειας της δραστηριότητας του Αστέρα Εκλάμψεων EV-Lac, Διδακτορική Διατριβή, Πανεπιστήμιο Θεσσαλονίκης, 1984.

2. B. Barbanis: «The Stochastic Behaviour of a Galactic Model Dynamical System» *Celestial Mechanics*, 33, 385-395, 1984.

3. G. Bozis: «Szebechely's inverse problem for finite symmetrical material concentrations», *Astron. Astrophys.*, 134, 360-364, 1984.

4. N. Caranicolas: «A second Integral of Motion in a Triaxial Galaxy», *Z. Naturforschung*, 39a, 395-396, 1984.

5. N. Caranicolas: «Period Orbits in a Resonant Dynamical System», *Celestial Mechanics*, 33, 209-215, 1984.

6. N. Caranicolas: «Exact Periodic Orbits in an Axisymmetric Dynamical System», *Lett. Nuovo Cimento*, 41, No 7, 234-237, 1984.

7. N. Caranicolas, H. Varvoglis: «Families of Periodic Orbits in Quartic Potentials», *Astron. Astrophys.*, 141, 383, 1984.

8. J.D. Hadjidemetriou, S. Ichtiaroglou: «A Qualitative Study of the Kirkwood Gaps in the Asteroids», *Astron. Astrophys.*, 131, 20-32, 1984.

9. D. Papadopoulos, B.C. Xanthopoulos: «Local Black Holes are Type D on the Horizon», *Il Nuovo Cimento*, 83B, 113, 1984.

10. N. Spyrou: «Center of Mass and Far Field Metric in Relativistic Magnetohydrodynamics», *Gen. Rel. Grav.*, 15, 411-415, 1984.

11. N. Spyrou: «Principles of Relativistic Celestial Mechanics Binary Stars (in Greek)», *Technical Annals B*, 4, N. 1-2, 181-201, 1984.

12. H. Varvoglis, K. Papadopoulos: «Large Scale Chaotic Motion of Charged Particles in a Longitudinal Electrostatic Wave», *J. Phys. A: Math. Gen.* 17, 311-321, 1984.

13. H. Varvoglis «Chaotic Ion Motion in Magnetosonic Plasma Waves», *Astron. Astrophys.*, 132, 321-325, 1984.

Meetings-International Scientific Collaborations

J. Hadjidemetriou participated, as Invited Speaker, in the I.A.U.: «Celestial Mechanics» at Ramsau, Austria, March 1984.

N. Caranicolas participated in the «6th Advanced Study Institute on the Stability of Solar System and its Minor Artificial Bodies», at Cortina, Italy, August 1984.

N. Spyrou participated a) in the «4th Gregynog Relativity Workshop», at Wales, September 27-29, 1984, where he presented a lecture under the title: «Is The Contraction of a Neutron Star Possible?» b) during the period from September 27, 1984 to September 29, 1984, N. Spyrou was invited by the University College, Cardiff University, Wales, where participated in the «Cardiff Discussion Meeting on Gravitational Radiation». Finally he attended the local meeting Recent Developments in Gravitation- I presenting the results of his work on gravitational radiation.

B. Barbanis continued his research activities at the European Southern Observatory, Garching, München, W. Germany from July 10, 1984 to August 10, 1984.

Professor J. Ehlers of the Ludwig-Maximilians Universität, Fakultät der Physik, München, W. Germany, was invited on September 10, 1984 and gave a lecture at the Astronomy Department under the title: «Gravitational Radiation: Theoretical and Observational Aspects».

1985 - Section of Astrophysics, Astronomy and Mechanics

Staff

In March Mr. T. Hadjiantoniou was appointed as a Ph.D. Student.

Drs K. Katopodis and Ch. Terzides were transferred to the Technical School of Thessaloniki.

In July Dr. J. H. Seiradakis and Dr. A. Bountis were appointed as Associate Professor and Assistant Professor respectively.

In September Mrs. K. Vassiliadis received one year leave of absence for Cardiff University, Wales.

In November Dr. L. Vlahos was appointed as Assistant Professor.

Dr. Th. Christidis was promoted to an Assistant Professor and Mrs. M. Mikou was appointed as a Ph. D. Student.

Mr. K. Kokkotas continued as a postgraduate student at Cardiff University, Wales where he received his M.Sc.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1985 was as follows:

Professors: B. Barbanis (A), G. Bozis(M), J. Hadjidemetriou(M).

Associate Professors: M. Michalodimitrakis (M), S. Persides (A), J.H. Seiradakis (A), N. Spyrou (A).

Assistant Professors: A. Bountis(M), Th. Christidis(M), S. Ichtiaroglou(M),

D. Papadopoulos(A), H. Varvoglis(A), L. Vlahos(A).

Lecturers: S. Avgoloupis(A), N. Caranicolas(A), G. Terzidis(M), G. Tsarouhas(M).

Assistants: Mr. F. Grogorelis(M).

Scientific Collaborators: Mr. K. Kokkotas(A)

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mr. K. Papadopoulos, Mrs. F. Papageorgiou, Mrs K. Vassiliadis.

Publications

1. B. Barbanis: «Evolution of families of Double- and Triple-Periodic Orbits», *Celestial Mechanics*, 36, 257-271, 1985.
2. G. Bozis, R. Mertens: «On Szebehely's Inverse Problem for a Particle Describing Orbits on a Given Surface», *ZAMP* (see p. 56), 65, 383, 1985.
3. G. Bozis, G. Tsarouhas: «Conservative Fields Derived from Two Monoparametric Families of Planar Orbits», *Astron. Astrophys.*, 145, 215-220, 1985.
4. N. Caranicolas: «On the Existence of Periodic Orbits in a Nearly Axisymmetric Galaxy», *Astron. Nachr.*, 306,1, 17-20, 1985.
5. N. Caranicolas: «Resonant Periodic Orbits in a Bisymmetrical Potential», *Astrophys. Sp. Sci.*, 112, 367, 1985.
6. G. Contopoulos, B. Barbanis: «Resonant Systems with Three Degrees of Freedom», *Astron. Astrophys.*, 153, 44-54, 1985.
7. J. D. Hadjidemetriou: «Hamiltonian Perturbations in Dynamical Systems», in Szebehely V. (ed.): «The Stability of the Solar System and its Minor Natural and Artificial Bodies», Reidel, 313-317, 1985.
8. J. D. Hadjidemetriou: «Periodic Orbits and Stability», I.A.U. Report for Commission 7, 22-25, 1985.
9. J. D. Hadjidemetriou: «The Stability of Resonant Orbits in Planetary Systems», in Ferraz-Mello, Sessin W.(eds): «Resonances in the Motion of Planets, Satellites and Asteroids», Universidade de Sao Paolo, 1-18, 1985.
10. S. Icthiaroglou, G. Bozis: «Stability of Circular Orbits in Non-Central Newtonian Fields», *Astron. Astrophys.*, 151, 64-68, 1985.
11. M. Michalodimitrakis, G. Bozis: «Bounded Motion in a Generalized Two-Body Problem», *Astrophys. Sp. Sci.*, 117, 217-225, 1985.
12. M. Michalodimitrakis, Ch. Terzides: «A New Mechanism of Ring Formation in Barred Galaxies», *Astrophys. Sp. Sci.*, 114, 191-201, 1985.
13. M. Michalodimitrakis, Ch. Terzides: «Three Dimensional Periodic Orbits in Barred Galaxies», *Astron. Astrophys.*, 150, 83-88, 1985.
14. E. Moghaddam-Taaheri, L. Vlahos, H. L. Rowland, K. Papadopoulos: «Runaway Tails in Magnetized Plasmas», *Phys., of Fluids*, 28, 3356, 1985.
15. D. Papadopoulos: «Effects of a Co-ordinate Mapping on a Particular Class of Static, Axially Symmetric Solution to the Einstein Equations», *Lett. Al Nuovo Cimento*, 44, 497-502, 1985.
16. D. Papadopoulos: «Soliton Solutions for Self-Dual SU (3) Gauge Field

Theory», *J. Math. Phys.*, 26, 2990-2994, 1985.

17. D. Papadopoulos, Paul F. Esposito: «Absorption of Gravitational Energy by a Viscous Compressible Fluid in a Curved Space-Time», *Astrophys. J.*, 292, 330, 1985.

18. D. Papadopoulos, J.L. Sanz: «A Class of Algebraically General Inhomogeneous Cosmologies», *II Nuovo Cimento*, 90B, No. 2, 191-203, 1985.

19. D. Papadopoulos, J.L. Sanz: «New Inhomogeneous Viscous-Fluid Cosmologies», *Lett. Nuovo. Cimento*, 42, 215-220, 1985.

20. J.H. Seiradakis, A.N. Lasenby, F. Yusef-Zadeh, R. Wielebinski, U-Klein: «A New Symmetrical Polarization Structure in the Centre of our Galaxy», *Nature*, 317, 697-699, 1985.

21. N. Spyrou and D. Papadopoulos: «Post-Newtonian Gravitational Radiation from Binary Stars», *Gen. Rel. Grav.*, 17, 1059-1067, 1985.

22. N. Spyrou: «The Possibility of Contacting Collapsed Stars», *Astron. Astrophys.*, 149, 283-290, 1985.

23. Ch. Terzides, M. Michalodimitrakis: «Periodic Orbits in Strong Bars», *Astrophys. Sp. Sci.*, 115, 377-385, 1985.

24. H. Varvoglis: «Non-ergodic Particle Motion in a C^0 Potential» *J. Physique*, 46, 495-502, 1985.

25. H. Varvoglis, K. Papadopoulos: «Stochastic Ion Acceleration by Coherent Electrostatic Waves», *J. Geophys.*, 56, 201-210, 1985.

26. H. Varvoglis, S. Ghosh: «Chaotic Behaviour of High Mach Number Flows», *Astron. Astrophys.*, 148, 35-42, 1985.

27. H. Varvoglis: «Stochasticity in Dynamical Systems and the Curvature of the Associated Riemannian Manifold», *Astrophys. Sp. Sci.*, 109, 495-502, 1985.

Meetings-International Scientific Collaborations

J. Hadjidemetriou participated in the meeting «Mathematical Methods in Celestial Mechanics» held in Oberwolfach, W. Germany, in May 1985. In August he continued his research activities at the European Southern Observatory, Garching, München.

H. Varvoglis visited the European Southern Observatory, Garching, München where he collaborated with Dr. G. Contopoulos on «nonlinear dynamics and chaos».

B. Barbanis continued his research activities at the European Southern Observatory, Garching, München, W. Germany, from July 15, 1985 to August 15, 1985.

N. Caranicolas participated a) in the General Assembly of I.A.U., held in N. Delhi, India, from November 16 to 29, 1985, where he was elected member of the Union, b) in the International Symposium «Space Dynamics and Celestial Mechanics», at N. Delhi, India, in November 1985, where he presented results of his work.

J.H. Seiradakis visited the Max-Planck-Institut für Radioastronomie, Bonn,

W. Germany, in December 1985 and collected observational data obtained with the 100m radiotelescope.

1986 - Section of Astrophysics, Astronomy and Mechanics

Staff

In January Dr. B. Barbanis was elected as Director of the Section.

In April Dr. S. Persides was appointed as Professor.

In May Dr. Ch. Papageorgiou, a former Assistant at the Department of Astronomy, was appointed as Lecturer.

In September Dr. A. Bountis was appointed as Associate Professor at the University of Patras and resigned from our Section.

In October Mrs. K. Vassiliadis returned from her leave of absence at Wales after receiving her M. A. in Communication.

In December Mr. K. Kokkotas returned from his leave of absence at Wales and continues his studies for his Ph.D. at our Section.

Dr. G. Tsarouhas was appointed Assistant Professor and Mrs. F. Papageorgiou retired.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1986 was as follows:

Professors: B. Barbanis (A), G. Bozis(M), J. Hadjidemetriou(M), S. Persides(A).

Associate Professors: M. Michalodimitrakis(M), J.H. Seiradakis(A), N. Spyrou(A).

Assistant Professors: Th. Christidis(M), S. Ichtiaroglou(M), D. Papadopoulos(A), H. Varvoglis(A), L. Vlahos(A), G. Tsarouhas(M).

Lecturers: S. Avgoloupis(A), N. Caranicolas(A), Ch. Papageorgiou(A).

Assistants: Mr. F. Grigorelis(M).

Scientific Collaborators: Mr. K. Kokkotas(A).

Ph.D. Students: Mrs. M. Mikou, Mr. T. Hadjiantoniou

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mr. K. Papadopoulos, Mrs. K. Vassiliadis.

Publications

1. Avgoloupis S.: «The flare star EV Lac. II. Relations between the characteristics of the flares», *Astron. Astrophys.*, 162, 151-156, 1986.

2. Barbanis B.: «Irregular Periodic Orbits» *Celestial Mechanics*, 39, 345-364, 1986.

3. Bozis G.: «Adelphic Potentials» *Astron. Astrophys.*, 160, 107-110, 1986.

4. Bozis G., Nakhl A.: «Solution of the three dimensional Inverse Problem», *Celestial Mechanics*, 38, 357-375, 1986.

5. Caranicolas N., Vozikis Ch.: «Orbital Characteristics of Dynamical Models of Elliptical Galaxies», *Celestial Mech.*, 39, 85-102, 1986.

6. Caranicolas N., Diplas A.: «A Method for obtaining Hamiltonians with simple periodic solutions», *Astron. J.*, 91, 660-664, 1986.

7. Caranicolas N., Diplas A.: «Dynamical Systems with simple periodic

Solutions», in Bhatnagar K. B. (ed.): «Space Dynamics and Celestial Mechanics», Reidel, 197-202, 1986.

8. Decker R.B., Vlahos L.: «Modeling of Ion Acceleration through Drift and Diffusion at Interplanetary Shock» *J. Geophys. Res.*, 91, 13.349-13.356, 1986.

9. Decker R.B., Vlahos L.: «Numerical studies of particle acceleration at turbulent, oblique shocks with application to prompt acceleration during solar flares», *Astrophys. J.*, 306, 710-729, 1986.

10. de Jager C., Heise J., Avgoloupis S., Cutispoto G., Kieboom K., Herr R.B., Lnadini M., Langerwerff A.F., Mavridis L.N., Melconian A. S., Molenaar R., Monsignori-Fossi B. C., Nations H.L., Pallavicini R., Pirola V., Rodono M., Seeds M.A., van den Oord G.H., Vilhu O., Waelkens C.: «Simultaneous optical and X-ray observations of a flare on BY Draconis», *Astron. Astrophys.*, 156, 95-100, 1986.

11. Hadjidemetriou J.D.: «A hyperbolic Twist Mapping Model for the Study of Asteroid Orbits Near the 3:1 Resonance», *Z. Angew. Math. Phys.*, 37, 776-796, 1986.

12. Ichtiaroglou S., Katopodis K., Michalodimitrakis M.: «Stability of resonant orbits in planetary systems with spheroidal star», *Astron. Astrophys.*, 169, 355-359, 1986.

13. Kokkotas S., Schutz B.F.: «Normal Modes of a Model Radiating System» *Gen. Rel. Grav.*, 18, 913-921, 1986.

14. Mavridis L. N., Avgoloupis S.: «The flare star EV-Lac. I. The activity cycle», *Astron. Astrophys.*, 154, 171-175, 1986.

15. Michalodimitrakis M., Terzides Ch.: «Three Dimensional Periodic Orbits in Barred Galaxies. II. Vertical Continuation of the Retrograde Family», *Astrophys. Space Sci.*, 124, 289-294, 1986.

16. Sprangler P., Vlahos L.: «Nonlinear analysis of a relativistic beam-plasma system cyclotron instability», *Physical Review A*, 33, 1261-1269, 1986.

17. Varvoglis H., Basios V.: «Stochastic energisation of ions by non-sinusoidal magnetosonic waves» in Bountis T. (ed.): «Nonlinear Dynamics and chaos in classical and quantum Systems», 94-97, 1986.

18. Vlahos L. et al: «Particle Acceleration. Chapter 2, Energetic Phenomena in the Sun» in Kundu M.R., Woodgate B. (eds.): «Proceedings of the Solar Maximum Mission Workshop, NASA CP-2439, 1-52, 1986.

19. Vlahos L.: «Theoretical studies on rapid fluctuations in solar flares», in Dennis B., Orwig L. E., Kiplinger A. L. (eds.): «Rapid Fluctuations in Solar Flares, NASA-CP2449, 455-460, 1986.

Meetings - International Scientific Collaborations

L. Vlahos a) has been invited twice for two weeks, to the Astronomical Observatory of Paris, once during January and later during June-July, b) participated, as Invited Speaker, in the «European Study Conference», held in Aubigny-sur-Nere, France, 1986.

K. Kokkotas participated a) in the Conference «Interferometric

Gravitational Wave Detectors» held in Cardiff, Wales, from February 16 to 17, 1986, b) in the Conference «Gravitation en Astrophysique», at Cargese, Corsica, July 15-31, 1986.

H. Varvoglis continued his research activities on «Ions acceleration due to plasma waves» at the University of Maryland, during May and June 1986.

B. Barbanis continued his research activities at the European Southern Observatory, Garching, München, W. Germany from July 25, 1986 to August 27, 1986.

Professor P. Florides of the Mathematics Department of the University of Crete was invited and gave on May 14, 1986 a lecture at the Astronomy Department under the title «A new interior Schwarzschild solution in the theory of general relativity».

1987 - Section of Astrophysics, Astronomy and Mechanics.

Staff

In January Dr. N. Spyrou was elected as Director of the Section, Dr. G. Tsarouhas was appointed as Assistant Professor and Mr. K. Papadopoulos retired.

In May Dr. N. Spyrou was appointed as Professor and Dr. N. Caranicas was appointed as Assistant Professor.

In August Dr. S. Avgoloupis was appointed as Assistant Professor.

In September Dr. Th. Christidis received one year leave of absence for France.

Dr. Ch. Papageorgiou stays in our Section as Associate Scientist.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1987 was as follows:

Professors: B. Barbanis(A), G. Bozis(M), J. Hadjidemetriou(M), S. Persides(A), N. Spyrou(A).

Associate Professors: M. Michalodimitrakis(M), J.H. Seiradakis(A).

Assistant Professors: S. Avgoloupis(A), N. Caranicas(A), Th. Christidis(M), S. Ichtiaroglou (M), D. Papadopoulos(A), H. Varvoglis(A), L. Vlahos(A), G. Tsarouhas(M).

Associate Scientists: Ch. Papageorgiou(A).

Assistants: Mr. F. Grigorelis(M).

Scientific Collaborators: Mr. K. Kokkotas(A).

Ph. D. Students: Mrs. M. Mikou, Mr. T. Hadjiantoniou

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mrs. K. Vassiliadis.

Publications

1. Avgoloupis S., Mavridis L.N., Varvoglis P.: «Photoelectric Observations of the Flare Star EV Lac in 1985», Comm. 27 IAU Inf. Bull. Variable Stars, 2997, 1987.

2. Avgoloupis S., Mavridis L.N., Varvoglis P.: «Photoelectric Observations of the Flare Star BY Dra in 1985», Comm. 27 IAU Inf. Bull. Variable Stars, 2998,

1987.

3. Avgoloupis S., Mavridis L.N., Varvoglis P.: «Photoelectric Observations of the Flare Star EV Lac in 1983», Comm. 27 IAU Inf. Bull. Variable Stars, 3016, 1987.

4. Bozis G., Ichtiaroglou S.: «Existence and Construction of Dynamical Systems having a Prescribed Integral of Motion - an Inverse Problem», Inverse Problems, 3, 213-227, 1987.

5. Caranicas N., Vozikis Ch.: «Families of Periodic Orbits in a Model of Interacting Galaxies» in 7th Advanced Study Institute, Cortina, Italy, August 1987.

6. Caranicas N., Vozikis Ch.: «Chaos in a Quartic Dynamical Model», Celestial Mechanics, 40, 35, 1987.

7. Caranicas N., Gousidou-Koutita M.: «On an Unharmonic Oscillator Potential for Elliptical Galaxies», J. Astrophys., 8, 331-341.

8. Contopoulos G., Varvoglis H., Barbanis B.: «Large Degree Stochasticity in a Galactic Model», Astron. Astrophys. 172, 55-66, 1987.

9. Hadjidemetriou J.: «Periodic Orbits and Stability», Proc. IAU, 96, 1987.

10. Hadjidemetriou J.: «Resonances in the Solar System and in Planetary Systems», Proc. X Regional European Astron. Meeting, Prague, 1987.

11. Hadjidemetriou J.: «Algebraic Mappings near a Resonance with an Application to Asteroid Motion», in Long Term Dynamical Behaviour of Natural and Artificial N-Body Systems, (ed. A.E. Roy) Reidel, 1987.

12. Ichtiaroglou S.: «Integrable Three-Dimensional Systems Possessing Linear and Quadratic Integrals of Motion», J. Phys. A, 20, 5079-5087, 1987.

13. Karimabadi H., Manyuk C.R., Sprangle P., Vlahos L.: «Electron Cyclotron Harmonic Wave Acceleration», Astrophys. J., 316, 462-472, 1987.

14. Kokkotas K., Spyrou N.: «Reversible Evolution of Charged Ergoregions», Gen. Rel. Grav., 19, 681-691, 1987.

15. Mavridis L.N., Avgoloupis S.: «The Flare Energy Spectrum of EV Lac», Astron. Astrophys. 188, 95-99, 1987.

16. Mavridis L.N., Avgoloupis S.: «Variation of the Flare-Energy Spectrum during the Activity Cycle of the UV Ceti-Type Stars», in the Midnight Sun Conference on Activity in Cool Star Envelopes, Tromsø, Norway, July 1987.

17. Moghaddam-Taaheri, Vlahos, L.: «Dynamics of Runaway Tails with Time Dependent Sub-Critical DC-Field in Magnetized Plasmas», Phys. Fluids, 30, 3155-3164, 1987.

18. Ozel M.E., Buccheri R., Seiradakis J.H., Schlöcker R., Sieber W.: «Search for fast pulsars in the field of COS-B source 2CG121+04», Bull. Amer. Phys. Soc., 32, 113, 1987.

19. Papadopoulos D.: «Higher Order Poles in the Belinski-Zakharov Method», Gen. Rel. Grav., 19, 359-370, 1987.

20. Reich W., Sofue Y., Inoue M., Seiradakis J.H.: «Observations of Linear Polarization in the Galactic Centre Region», in Interstellar Magnetic Fields (ed.

R. Beck, R. Grave) Springer, Berlin 146-149, 1987.

21. Sofue Y., Reich W., Inoue M., Seiradakis J.H.: «The Magnetic Field Near the Galactic Centre», Publ. Astron. Soc. Japan, 39, 95-107, 1987.

22. Spyrou N.: «Self-Energy Losses in the Binary Pulsar PSR 1913+16», Astron. Astrophys., 174, 355-356, 1987.

23. Spyrou N., Varvoglis H.: «Stellar Orbits in Elliptical Galaxies with Relativistically Active Nuclei», J. Astrophys. Astron., 8, 1016, 1987.

24. Stewart, B.W., Witten, L., Papadopoulos D.: «Gravitational Field with Toroidal Topology», Gen. Rel. Grav., 19, 827-840, 1987.

25. Vlahos, L.: «Electron Cyclotron Maser Instability in Solar Flares (Invited Review)», Solar Phys., 111, 155-166, 1987.

26. Vlahos, L., Sprangle, P.: «Evolution of the Axial Electron Cyclotron Maser Instability with Applications to Solar Microwave Spikes», Astrophys. J., 322, 463-472, 1987.

Meetings - International Scientific Collaborations

B. Barbanis continued his research activities at the European Southern Observatory, Garching bei München, from July 1, 1987 to Aug. 25, 1987.

N. Caranicas participated in the Summer School: «7th Advanced Study Institute», at Cortina, Italy, where he presented the paper «Orbits in a Model of interacting Galaxies», which has been written jointly with Ch. Vozikis.

J. Hadjidemetriou participated, as Invited Speaker, a) in the I.A.U. Colloquium, held in Turku, Finland, June 1987, b) in the 10th European Astronomical Conference of I.A.U. in Prague, of which he was member of the Scientific Organizing Committee, c) in the Summer School: «Advanced Study Institute» held at Cortina, Italy.

N. Spyrou a) as a British Council Scholar continued his research activities at the University of Cambridge, England, during June-July, 1987, b) participated in the International Conference «300 Years of Gravity-Newton Tercentenary Meeting» held at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, England, in June 1987, c) participated in the «Post-Newtonian String Workshop» during July 1987, held at the Department of Applied Mathematics and Theoretical Physics, University of Cambridge, England, d) on August attended the workshop of NATO Advanced Study entitled «The Post-Recombination Universe», held at the Institute of Astronomy, University of Cambridge, England.

L. Vlahos a) has been invited and participated in the workshop «Thermal/Non-thermal interaction in Solar Flares», held at the U.S.A., from March 23 to 27, 1987, b) has been invited and visited the University of Maryland, U.S.A. from July 15 to August 31, 1987.

1988 - Section of Astrophysics, Astronomy and Mechanics Staff

In March Mr. A. Takatinis was employed as a technician.

In April Mr. K. Kokkotas received his Ph. D.

In April Dr. N. Caranicas received two-month leave of absence for Namur, Belgium.

In June Mr. A. Anastasiadis was appointed as Ph. D. Student.

Dr. Ch. Papageorgiou stays in our Section as Associate Scientist.

In September Dr. D. Papadopoulos received three months leave of absence for Liege, Belgium.

In November Mrs M. Mikou left the Department.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1988 was as follows:

Professors: B. Barbanis (A), G. Bozis (M), J. Hadjidemetriou (M), S. Persides (A), N. Spyrou (A).

Associate Professors: M. Michalodimitrakis (M), J.H. Seiradakis (A).

Assistant Professors: S. Avgoloupis (A), N. Caranicas (A), Th. Chrisidis (M), S. Ichiaroglou (M), D. Papadopoulos (A), H. Varvoglis (A), L. Vlahos (A), G. Tsarouhas (M).

Associate Scientists: Ch. Papageorgiou (A).

Assistants: Mr F. Grigorelis (M).

Scientific Collaborators: Mr. K. Kokkotas (A).

Ph. D. Students: Mr. A. Anastasiadis, G. Voyatzis.

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mrs. K. Vassiliadis, Mr. A. Takatinis.

Publications

1. Barbanis, B.: «Ανώμαλες περιοδικές τροχιές», In Memoriam D. Kotsakis, 59-67, eds. Contopoulos, G., Barbanis, B., Laskaridis, P., 1988.

2. Bozis, G.: «Two Inequalities of the Sundman type for the general non-planar three-body problem», In Memoriam D. Kotsakis, 59-67, eds. Contopoulos, G., Barbanis, B., Laskaridis, P., 1988.

3. P. Cargill, C.C. Goodrich and L. Vlahos: «Collisionless shock formation and prompt acceleration of solar flare-ions», Astron. Astrophys., 189, 254-262, 1988.

4. Chapsiadis, A., Michalodimitrakis, M.: «Bounded motion in a two - body system consisting of a solid body and a material point», Cel. Mech., 41, 53-63, 1988.

5. Hadjidemetriou, J.: «Periodic Orbits and Stability», In Proc. IAU 96, The Few Body Problem, ed. Valtonen, M., 32-48, 1988.

6. Hadjidemetriou, J.: «A Mapping Model for the study of Resonant Asteriod Orbits», In Memoriam D. Kotsakis, 95-110, eds. Contopoulos, G., Barbanis, B., Laskaridis, P., 1988.

7. Hadjidemetriou, J.: «Algebraic Mappings near a Resonance», in Long Term Behaviour of Natural and Artificial N-body systems, ed. Roy, A.E., 257-276, 1988.

8. Hadjidemetriou, J.: «Periodic Orbits of the Planetary Type and their

Stability», *Celestial Mechanics*, 43, 371-390, 1988.

9. Hadjidemetriou, J.: «Periodic Orbits and Stability», monography, p.44, 1988.

10.A. Hillaris, C. Alissandrakis and L. Vlahos: «Dynamics of sub-relativistic electron beams in magnetic traps: A model for solar N-bursts» *Astron. Astrophys.*, 195, 301-309, 1988.

11.Ichtiaroglou, S., Voyatzis, G.: «Integrable Potentials with Logarithmic Integrals of Motion», *J. Phys. A*, 21, 3537-3546, 1988.

12.K.Kokkotas: «The geometry of the Kerr-Newman Ergosurface» *Gen. Rel. Grav.*, 20, 829-839, 1988.

13. Kokkotas, K.D., Schutz, B.F.: «Black Hole Normal Modes III: Semi-analytic and Numerical Approach», *Phys. Rev. D*, 37, 3378-3387, 1988.

14.G.Kolovos, J. H. Seiradakis, H. Varvoglis and S. Avgoloupis: «Photographic evidence of a short duration strong flash from the surface of the Moon», *Icarus* 76, 525-532, 1988.

15.Mavridis, L.N., Avgoloupis, S.: «Variation of the flare energy spectrum during the activity cycle of the UV Ceti-type stars», *Activity in Cool Star Envelopes*, ed. Harnes, O. et al, 65-68, 1988.

16.E. Moghaddam-Taaheri and L. Vlahos: «Synchrotron radiation from dynamically evolving runaway tails», *Phys. Fluids*, 31(1), 99-106, 1988.

17.D.Papadopoulos: «Soliton solutions for Self-Dual SU (n) gauge fields on Euclidean space obtained from a non-diagonal seed solution», *Phys. Lett.*, 127A, 341, 1988.

18.D. Papadopoulos: «Some properties of the Scalar Field in a Schwarzschild SpaceTime», *Il Nuovo Cimento*, 101B, 395, 1988.

19.Reich, W., Sofue, Y., Wielebinski, R., Seiradakis, J. H.: «A study of the Radio Spectral Index in the Galactic Centre Region: Evidence of an Unusual Nothermal Emission Component», *Astron. Astrophys.*, 191, 303-312, 1988.

20.N.Spyrou: «Accretion Effects on Compact Members of Binary Stars», *J. Astrophys. Astron.*, 9, 25-39, 1988.

21. N. Spyrou: «Newtonian and Relativistic Aspects of the Elliptical Spheroidal Galaxies», In Memoriam D. Kotsakis, 369-377, eds. G. Contopoulos, B. Barbanis, P. Laskaridis, 1988.

22.L.Vlahos: «Narrow-Bandwidth radiation process in space and astrophysical plasmas: A review», In memoriam of D. Kotsakis eds G. Contopoulos, B. Barbanis and P.G. Laskaridis, 411-423, 1988.

Meetings - International Scientific Collaborations

B. Barbanis continued his research activities at the European Southern Observatory, Garching, München, W. Germany, from July 15 to August 15 1988.

N. Caranicolos visited the University of Namur, Belgium, where he collaborated with Prof. J. Henrard on the restricted problem of three bodies.

J. Hadjidemetriou participated, as Invited Speaker, a) in the IAU «Celestial Mechanics», held at Ramsau, Austria, March 1988 and b) in the Summer

School «Singular Behaviour and Nonlinear Dynamics», Samos, during July 1988.

S. Ichtiaroglou visited the University of Burgoundie, Dijon, France, during June, where he participated in the ERASMUS program.

S. Ichtiaroglou and G. Voyatzis participated in the «Singular Behaviour and Nonlinear Dynamics», held at Samos, August 1988.

D. Papadopoulos visited the Institute of Astrophysics, Liege, Belgium, from September 1 to November 20, 1988.

J.H. Seiradakis participated in the IAU Symposium No 136, held at Los Angeles, USA, July 1988, where he gave a lecture entitled «Symmetrical Structures in the Galactic Center Region». From November 15, 1988 to December 15, 1988 he continued his research activities at the Max-Planck Institut für Radioastronomie, Bonn, W. Germany, with financial support from the Institut, and participated at the Seminar «Astronomie in Griechenland» Bonn, W. Germany, where he presented a lecture entitled: «A short-duration lunar transient phenomenon».

In August J. H. Seiradakis, as National Representative, H. Varvoglis and N. Caranicolos participated in the General Assembly of IAU held at Baltimore, USA.

H. Varvoglis participated in the IAU Colloquium No 109, «Applications of Computer Technology to Dynamical Astronomy», Gaithersburg, Maryland, USA.

L. Vlahos has been invited to visit the Astronomical Observatory of Paris during January and July 1988.

1989 - Section of Astrophysics, Astronomy and Mechanics

Staff

In April Mr. G. Voyatzis was appointed as a Ph. Student.

On July 23 Dr. G. Tsarouhas passed away while on holidays in Crete.

Thus the staff of the Section of Astrophysics, Astronomy and Mechanics at the end of 1989 was as follows:

Professors: B. Barbanis(A), G. Bozis (M), J. Hadjidemetriou (M), S. Persides(A), N. Spyrou(A).

Associate Professors: M. Michalodimitrakis (M), J.H. Seiradakis (A).

Assistant Professors: S. Avgoloupis (A), N. Caranicolos(A), Th. Christidis (M), S. Ichtiaroglou (M), D. Papadopoulos (A), H. Varvoglis(A), L. Vlahos(A).

Associate Scientists: Ch. Papageorgiou(A).

Assistants: Mr. F. Grigorelis (M).

Scientific Collaborators: Mr. K. Kokkotas (A).

Ph. D. Students: Mr. A. Anastasiadis, G. Voyatzis.

Secretaries and Technicians: Mrs. C. Gogou-Handji, Mr. G. Kolovos, Mrs. K. Vassiliadis, Mr. A. Takatinis.

Publications

1. Bozis, G.: A transformed equation for a vanishing Poisson bracket, *J. Phys.*

A.: Math. Gen., 22, 1989.

2. Caranicolas, N.: Some properties of an Intrinsically Degenerate Hamiltonian System, *J. Astr. Astron.*, 10, 197-202, 1989.

3. Contopoulos, G., Barbanis, B.: «Lyapunov characteristic numbers and the structure of phase-space», *Astron. Astrophys.*, 222, 329-343, 1989.

4. de Jager, C., Heise, J., van Genderen, A.M., Foing, B.H., Ilyin, I.V., Kilkenny, D., Avgoloupis, S., Mavridis, L., Cutispoto, G., Rodono, M., Seeds, M.A., Yuen K. Ng, van Driel, W., Rabattu, X., Zodi, A.M., Vilas Boas, J.W.S., Scalise, E., Schaal, R.E., Kaufmann, P. and Waelkens, C.: «Coordinated observations of a large impulsive flare on UV Ceti», *Astron. Astrophys.*, 211, 157-172, 1989.

5. Hitzanidis, K., Vlahos, L. and Polymilis, G.: «Electron acceleration by obliquely propagating electromagnetic waves: test of validity of Fokker-Planck-Kolmogorov approach», *Physics of Fluids*, B1(3), 682, 1989.

6. Ichtiaroglou, S. and Voyatzis G.: «Integrable potentials with logarithmic integrals of motion», in *Singular Behavior and Non-linear Dynamics*, World Scientific, 78-83, 1989.

7. Ichtiaroglou, S.: «On the non-integrability of Yang-Mills potentials», *J. Phys. A: Math. Gen.*, 22, 3461-3465, 1989.

8. Ichtiaroglou, S., Katopodis, K. and Michalodimitrakis, M.: «Periodic orbits in tree-dimensional planetary systems», *J. Astrophys. Astr.*, 10, 367-380, 1989.

9. Mavridis, L. N., Avgoloupis, S.: «Variation of the flare energy spectrum during the activity cycle of the UV Ceti-type stars», *Activity in Cool Star Envelopes*, eds, Harnes, O. et al., 65-68, 1989.

10. Mavridis, L. N., Nikolov, N.S., Avgoloupis, S.I. and Varvoglis, P.P.: «The Cepheid 1162 Aql», *Astron. Astrophys. Suppl. Ser.*, 80, 279-284, 1989.

11. Michalodimitrakis, M., Grigorelis, F.: Stability of resonant planetary orbits in binary stars, *J. Astrophys. Astron.*, 10, 347-365, 1989.

12. Pettersen, B.R., Panov, K.P., Ivanova, M.S., Ambruster, C.W., Valtaoja, E., Valtaoja, L., Avgoloupis, S., Mavridis, L.N., Seiradakis, J.H., Sundland, S.R., Olah, K., Harnes, O., Olsen, F., Solheim, J.E. and Aanesen, T.: «The flare activity of AD Leo 1972-1988», *IAU Symposium No. 137 on Flare Stars in Star Clusters, Associations and the Solar Vicinity*, 1989.

13. Seiradakis, J.H., Reich, W., Wielebinski, R., Lasemby, A.N., Yusef-Zadeh, F.: «Radio Continuum Observations of the Galactic Centre at 4.75 and 10.7 GHz», *Astron. Astrophys. Suppl.* 81, 291-302, 1989.

14. Seiradakis, J.H., Reich, W., Sofue, Y.: «Symmetrical Structures in the Galactic Centre Region», in *the Galactic Center*, Symp. IAU No. 136, ed. Morris, M., Reidel, 237-242, 1989.

15. H. Varvoglis and V. Basios: «Stochastic acceleration of ions by a non-sinusoidal magnetosonic wave», *J. Plasma Physics*, 41, 381-393, 1989.

16. Vlahos, L.: «Particle acceleration in Solar Flares», *Solar Physics*, 121,

431-447, 1989.

Meetings - International Scientific Collaborations

A. Anastasiadis as a European-Doctoral-Astrophysics-Network Scholar visited the Max-Planck-Institut für Physik and Astrophysik, Institut für Extraterrestrische Physik from Feb. 1 to July 31, 1989.

B. Barbanis continued his research activities at the European Southern Observatory Garching bei München from July 20 to August 20, 1989.

J. Hadjidemetriou visited the University of Liverpool, England during February-March, 1989 and University of Namur, Belgium during April-May, 1989.

L. Vlahos participated as Invited Speaker in the Committee for the European Studies in Radio Solar Physics, held in Braunwald, Switzerland, August 1989.

Basil Barbaris
Professor of Astronomy

RESEARCH CENTER FOR ASTRONOMY AND
APPLIED MATHEMATICS
ACADEMY OF ATHENS

ACTIVITIES IN THE PERIOD 1981 - 1989

From the year 1981 until 1989 the staff of the center is as follows:

1. Dr. C. Poulakos, Director
2. Dr. V. Tritakis, Chief Assistant
3. Dr. B. Petropoulos, Chief Assistant
4. Dr. H. Dara - Papamargariti, Assistant
5. Dr. Th. Zachariadis, Assistant
6. Dr. Y. Liritzis, Assistant (effective 1989)
7. Mr. M. Chondros, Secretary - Librarian
8. Mr. E. Tsioros, Technician
9. Mrs. E. Panoussi - Koundourioti, Secretary

Scientific Collaborators

1. Prof. L. Mavridis, University of Thessaloniki
2. Prof. C. Goudas, University of Patras
3. Dr. C. Macris, Honorary director of the Center.

National Scientific Committees:

The Center continued offering these years Secretarial facilities to the following committees:

- 1) National Committee for Astronomy
- 2) National Committee for Mathematics
- 3) National Committee for space Research

President of these Committees is Prof. Dr. J. Xanthakis, Head of the Center, and Secretary is Mr. M. Chondros.

The scientific interest of the center is as follows:

- 1) Solar Physics - Solar Activity
- 2) Solar and Terrestrial Phenomena
- 3) Interplanetary Physics
- 4) Space Physics

1981

Publications:

1. J. Xanthakis, Ch. Zerefos, P. Sehra, Ch. Repapis and C. Poulakos: «Rocket Sonde - Derived Stratospheric Temperatures Changes Associated with a Major Solar Cosmic Ray Event». *Astroph. and Space Science* Vol. 74, pp.

450-475, 1981. Contribution No 86.

2. J. Xanthakis: «Possible Periodicities of the Annually Released Planetary Seismic Energy ($M \geq 7.8$) During the Period 1898-1977» *Praktika of the A.A.* Vol. 55, pp. 242-256, 1981. Contributions No 87.

3. C. Macris and B. Petropoulos: «The Weather on Mars on the Basis of the Measurements Carried out by the Viking Mission» «Compendium in Astronomy». A volume published in honor of prof. J. Xanthakis by the Reidel Publ. Co. 1982. Contribution No. 88.

4. C. Macris and B. Petropoulos: «Voigt Profile for the CO Emission Lines in the Solar Sunspot Spectrum». *A.S. S.L.*, Vol. 96, pp. 107-108, 1982. Contribution No. 89.

5. J. Xanthakis: «Possible Periodicities of the Annually Released Global Seismic Energy ($M \geq 7.9$) During the Period 1898-1971» *Tectonophysics*, Vol. 81, pp. 7-14, 1982. Contributions No. 90.

Meetings - Scientific Missions

Prof. J. Xanthakis and Dr. C. Poulakos participated in the International Symposium «On the Hellenic Arc and Trench» held in Athens in April 1981. Prof. J. Xanthakis presented in this Symposium his work on «Seismic Activity on a Global Basis» which was published in the proceedings of the Symposium.

Dr. C. Poulakos on the base of the Scientific and Cultural Exchange Program between Greece and Czechoslovakia visited there the Astronomical and Geological Institutes and lectured on a relative subject about the structure of the Galaxy.

Dr. V. Tritakis left the Center in November 1981 with one year leave of absence to the Max-Planck Institut für Physik und Astrophysik in Munich under a fellowship of the cited Institute.

Mrs. H. Dara-Papamargariti got a three months leave of absence to the Astrophysical Institute in Paris.

Dr. B. Petropoulos participated in the VIth European Astronomical Meeting in Dubrovnik, Yugoslavia in October 1981. He presented there two papers one of his own and one of Dr. V. Tritakis.

1982

Publications

1. C. Alissandrakis, C. Macris and Th. Zachariadis: «Measurements of the Granule - Intergranular Lane Contrast at 5.200 Å and 6.300 Å». *Solar Physics* Vol. 76, pp. 129-136, 1982. Contribution No. 91.

2. V. Tritakis: «Evidence of Interdependence within 22-Year Solar Cycles». *Astrophys. Space Science*, Vol. 82, pp. 463-471, 1982. Contribution No. 92.

3. B. Tritakis: «Interplanetary Magnetic Field and Solar Cycle Modulation of the Tropospheric Circulation over West Mediterranean» *A.S.S.L.*, Vol. 92,

pp. 215-216, 1982. contribution No. 93.

4. V. Tritakis: «Evidence of Solar Influence on the Tropospheric Circulation in Summertime». Arch. Met. Geoph. Biokl. Ser. A., Vol. 31, pp. 421-429, 1982. Contribution No. 94.

5. C. Macris and B. Petropoulos: «L' Oxyde de Carbon dans l' Atmosphere de Mars». C.R. Acad. Sci. Paris, t. 295, pp. 989-992, 1982. Contributions No. 95.

Meetings - Missions

The Superintendent of the Center prof. John Xanthakis participated to the XVIII General Assembly of the IAU held in Patras from 17 to 26 August 1982. Prof. John Xanthakis was the National Representative of the Greek Delegation and was the President of the National Organizing Committee of the Assembly. He was the Chairman of the Inaugural Ceremony of the Meeting held at the Ancient ODION of Patras.

Dr. B. Petropoulos and Mr. Th. Zachariadis attended the cited General Assembly and communicated their work under the title: «The Auroral and Archaeomagnetic Activity of the Earth During the Last 7000 years».

Dr. B. Petropoulos presented also the following papers:

a) «Frank Condon Factors and Synthetic Profiles for Molecules of the Astrophysical Interest».

b) «A Model for the Jupiter Atmosphere» (By B. Petropoulos, C. Macris and C. Banos).

c) «The Green Line Intensity and Solar Wind Streamers» (by J. Xanthakis, B. Petropoulos and H. Mavromichalaki).

Miscellaneous

The well Known Publishing Co. D. Reidel Publishing Co. published a special volume dedicated in honor of Prof. Dr. John Xanthakis for his 25 - Years scientific contribution in the Academy of Athens. Editors of the Honorary volume were Prof. P. Theocharis, Prof. H. Mariolopoulos, members of the Academy of Athens and Prof. L. Mavridis of the University of Thessaloniki. 50 distinguished scientists from over all the world contributed in this special volume. The Academician Prof. P. Theocharis presented the book at a special public ceremony in the Academy of Athens. Dr. V. Tritakis offered one year's leave of absence to the Max-Planck Institut für Physik und Astrophysik in Munich returned to the Center, effective November 15, 1982.

1983

Publications:

1. C. Macris and J. Rösch: «Variations des mailles du Réseau de la

Granulation Photosphérique en Fonction de l' Activite Solaire». C.R. Acad. Sci. Paris. t. 226, pp. 265-268, 1983. contribution No. 96.

2. V. Tritakis: «Small Scale Solar Magnetic Fields and their Relation to Various Solar Activity Indices». A.S.S. t. 93, pp. 141-147, 1983. Contribution No. 97.

3. G. Banos and H. Dara-Papamargariti: Dynamical Behaviour of Surges» Astron. Astrophys. Vol. 120, pp. 181-184, 1983. Contribution No. 98.

4. H. Dara-Papamargariti and S. Koutchmy: «Photospheric Faculae - III Intensity and Magnetic Field Mapping of a Typical Element of the Photospheric Network» Astron. Astrophys. Vol. 125, pp.280-286, 1983. Contributions No. 99.

Meetings - Missions

Dr. V. Tritakis left the Center with one month leave of absence to the University of Thessaloniki.

Dr. B. Petropoulos attended the 2nd European Geophysics Assembly held in Strasburg, France in March 1983 where he presented the work «Simultaneous Variations of Auroral Frequency, Solar Activity and Geomagnetic Field for the Last 2500 years.» (by B. Petropoulos, Th. Zachariadis and Y. Liritzis).

Dr. Y. Liritzis presented also the work of Prof. J. Xanthakis, Y. Liritzis and Prof. Aitken under the title: «Geomagnetic Time Spectrum Through Archeomagnetism».

Dr. B. Petropoulos attended also the following Meetings.

1) The Panhellenic Assembly in Physics held in Kalamata, Greece, in July 1983 where he presented 3 papers related with his field of interest.

2) The 7th European Astronomical Meeting held in Florence, Italy in December 1983 where he presented 3 papers.

a. «The Solar Minimum Temperature Determined by the CO ($A^1\Pi-X^1\Sigma$) Transition» (by B. Petropoulos and C. Macris).

b. «The Green Line Intensity and the Solar Wind Streams for the 20th Solar cycle» (by J. Xanthakis, B. Petropoulos and H. Mavromichalaki).

3. «An Investigation of Auroral Frequency and Solar - Terrestrial Parameters in Relation to the Solar Magnetic field Reversals» (by B. Petropoulos and Y. Liritzis).

1984

Publications:

1. B. Petropoulos and C. Banos: «A Reference Model for the Upper Atmosphere of Jupiter». Astron. Astrophys. S.S. Vol. 58, pp. 145-161, 1984. Contribution No. 100.

2. V. Tritakis: «Possible Solar Signature on a Well-Established Weather Phenomenon». J. Geophys. Res. Vol. 89 A, pp. 2609-2615, 1984. Contribution

No. 101.

3. J. Xanthakis, M. Shimshoni: «Possible Periodicities of the Annual Released Global Seismic Energy ($M \geq 7.9$) During the Period 1898-1971, Discussion». Tectonophysics, Vol. 107, pp. 173-176, 1984. Contributions No. 102.

4. B. Petropoulos and H. Mavromichalaki: «Time-Lag of Cosmic Ray Intensity». Astr. and Space Science. Vol. 106, pp. 61-71, 1984. Contributions No. 103.

5. V. Tritakis: «Low - Energy Proton Interaction with Interplanetary Magnetohydrodynamic Discontinuities». Adv. Space Res., Vol. 4, No.7, pp. 323-326, 1984. Contribution No. 104.

6. V. Tritakis: «North-South Asymmetries of the Solar Magnetic Field in Conjunction with the Location of the Heliospheric Current Sheet on Both Sides of the Solar Equator». Adv. Space Res., Vol. 4, No. 8, pp. 125-128, 1984. Contribution No. 105.

7. V. Tritakis: «Heliospheric Current Sheet Displacement with Respect to the Solar Equator» J. Geophys. Res. Vol. 89 A, pp.6588-6598, 1984. Contribution No. 106.

Meetings - Missions

1) Dr. V. Tritakis and Dr. B. Petropoulos attended the 25th Meeting of COSPAR held in Graz, Austria in June 1984 where they presented their recent work.

2) Dr. B. Petropoulos attended also the Workshop in Meudon, France (June 1984) where he presented some papers of Prof. J. Xanthakis, Dr. C. Poulakos and Dr. V. Tritakis as well as a paper of his own.

3) Dr. B. Petropoulos attended also the International Symposium of OZON held in Chalkidiki in September 1984 where he presented a relative paper.

Miscellaneous

1) Dr. V. Tritakis with a one month leave of absence went to University of Thessaloniki in order to collaborate with Prof. Ch. Zeferos.

2) Dr. H. Dara-Papamargari with a two-months leave of absence went to the Astrophysical Institut of Paris.

3) Dr. Th. Zachariadis invited to lecture to the University of Ioannina.

4) Dr. C. Poulakos was invited to lecture to the Greek-French Meeting held in Athens in December 1984. This Meeting was organized by the CNRS and the National Research Foundation.

5) The Director of the Center invited Prof. J. Dunjey to visit the Center from 26.11-7.12.1984. Part of the expences were covered by the British Council in Athens.

1985

Publications:

1. J. Xanthakis, Y. Liritzis and B. Petropoulos: «Evidence for Periodicities in the Frequency Occurrence of the Aurora Borealis since 300 AD». J. Interdisciplinary Cycle Res. vol. 16, pp. 85-91, 1985. Contribution No. 107.

2. J. Xanthakis and C. Poulakos: «Long and Short Term Variation of the 10.7 cm Solar Flux. The Photospheric Granules and the Zurich Numbers». Astrophys. and Space Science, Vol. 111, pp. 179-188, 1985. Contribution No.108.

3. C. Macris and B. Petropoulos: «The Solar Minimum Temperature Determined by the CO ($A^1 - x^1$)». Astrophys. Sp. Sci. Vol. 116, pp. 165-175, 1985. Contribution No. 109.

4. V. Tritakis: «Does the Interplanetary Magnetic Field and the Solar Activity Contribute to the Tropospheric Circulation?». PAGEOPH Vol. 123, pp. 476-496, 1985. Contribution No. 110.

Meetings - Missions:

Dr. C. Poulakos was invited to perform collaboration with the staff of the Max-Planck-Institut für Radio-Astronomie in Bonn in September-October 1985. During this period Dr. C. Poulakos visited the Imperial College of Science and Technology in London on a mutual research project.

Dr. C. Poulakos in October, 1985 visited also the University of Innsbruck, Austria.

Dr. V. Tritakis attended the Summer School in Kolybari, kreta on «Plasma Astrophysics».

Dr. V. Tritakis received a months leave of absence from the Center in August 1985.

Dr. Petropoulos received a month leave of absence from the Center in September 1985.

Dr. Th. Zachariadis, received 20 days leave of absence from the Center in May 1985.

Prof. Dr. Z. Kopal was invited to lecture to the Academy of Athens within the frame of our mutual collaboration.

1986

Publications:

1. Y. Liritzis and B. Petropoulos: «Dependence of the Aurora Borealis Occurrence of the Solar-Terrestrial Parameters». Earth-Moon and Planets Vol. 34, pp. 65-75, 1986. Contribution No. 111.

2. V. Tritakis: «Anisotropic Distribution of the Solar Activity and Consequences in the IMF Configuration». Adv. Sp. Res. Vol. 6, No. 6, pp. 339-342, 1986. Contribution No.112.

Meetings - Missions

1) Dr. V. Tritakis participated in the 26th Meeting of COSPAR in Toulouse where he presented a paper of his own. The above scientist attended also the 4th Meeting of the Greek Physicists Association held in Athens in December 1986 where he presented a short review of the activities of the Center.

2) The same meetings attended also Dr. B. Petropoulos who presented some papers of his and his collaborators.

Miscellaneous

Dr. V. Tritakis received one month leave of absence from the Center and visited the Rutherford Appleton Laboratory as well as the Imperial college, Blackett Laboratories in England.

Dr. H. Dara received one month leave of absence from the Center to the observatory of Meudon and to the Athens University.

1987

Publications:

1. H. Mavromichalaki and B. Petropoulos: «An Empirical Model for the 11-Year Cosmic-Ray Modulation». Earth, Moon and Planets, Vol. 37, pp. 79-88, 1987. Contribution No. 113

2. Th. Zachariadis, C. Alissandrakis and G. Banos: «Observations of Ellerman bombs in Ha». Solar Physics, vol. 108, pp. 227-236, 1987. Contribution No. 114.

3. H. Dara, C. Alissandrakis and S. Koutchmy: «Small-Scale Motions Over Concentrated Magnetic Regions of the Quiet Sun». Solar Physics, Vol. 109, pp. 19-29, 1987. Contribution No. 115.

4. Y. Liritzis and B. Petropoulos, «Latitude Dependence of Auroral Frequency in Relation to Solar-Terrestrial and Interplanetary Parameters». Earth, Moon and Planets, Vol. 39, pp.1987. Contribution No. 116.

5. B. Petropoulos and A. Georgakilas: «Physical Parameters for the Saturn Atmosphere Computed by Using Yoyager Data». Adv. Space Res., Vol. 7. No 12, pp. 33-37, 1987. Contribution No. 117.

6. A. Angelopoulos and C. Poulakos: «The Influence of the Planets in the Seismic Activity of the Earth». Publications of the Greek Geophysical Military Service. No. 132 p.p. 41-78, 1987. Contribution No. 118.

7. Th. G. Zachariadis: «Bright Facular Points (Filigree) in Active Ragions». Publications of the Astron. Inst. of the Chechoslovak Academy of Sciences No. 66, pp. 37-39, 1987. Contribution No. 119.

8. J. Xanthakis, C. Banos and B. Petropoulos: «Probable Periodicities of the Jovian Atmospheric Activity». Publications of the Astron. Inst. of the Czechoslovak Academy of Sciences, No. 67, pp. 287-290, 1987. Contribution No. 120.

9. B. Petropoulos and A. Georgakilas: «A Reference Model for the Atmosphere of Titan». Publications of the Astron. Inst. of the Czechoslovak Academy of Sciences, No. 67, pp. 291-294, 1987. Contribution No.121.

Meetings - Missions

Dr. B. Petropoulos attended the following Meetings:

1. International Astronautical Federation in Brighton, England, October 1987.

2. Symposium in Ioannina on «Laser and its Applications», in May 1987.

3. Symposium in Patras on «Solid Physics» in September 1987.

4. He visited the Observatory of Meudon and the Institute of Bagnere de Bigorre in France in November 1987.

Dr. H. Dara received one month leave of absence from the Center and she visited the Observatory of Sacramento Peak of the U.S.A.

Dr. Th. Zachariadis participated in the 10th European Astronomical Meeting in Prague in August 1987 where he presented some papers worked out at the Center.

1988

Publications:

1. V. Tritakis, H. Mavromichalaki and B. Petropoulos: «Asymetric Variations of the Coronal Green Line Intensity». Solar Physics, Vol. 115, pp. 367-384, 1988. Contribution No. 122.

2. J. Xanthakis, C. Poulakos and B. Petropoulos: «Possible Periodicities of High-Speed Solar Plasma». Astroph. Sp. Sci., Vol. 141, pp. 233-250, 1988. Contribution No. 123.

3. J. Xanthakis and V. Tritakis: «Sector Boundary Occurrences in the Interplanetary Medium». Earth, Moon and Planets, Vol. 41, pp. 279-288, 1988. Contribution No. 124.

4. C.J. Banos and B. Petropoulos: «Physical Parameters of the Jovian Atmosphere». Earth, Moon and Planets, Vol.42, pp. 19-28, 1988. Contribution No.125.

5. P. Petropoulos: «Physical Parameters of the Atmosphere of Venus». Earth, Moon and Planets, Vol. 42, pp. 29-40, 1988. Contribution No. 126.

6. V.P. Tritakis: «Low Energy Cosmic Rays Interaction with Interplanetary Discontinuities». Reprint from the volume «In Memoriam D. Kotsakis», Athens 1988, pp. 379-392. Contribution No. 127.

7. J. Xanthakis, C. Poulakos: «Long and Short - Term Predictions of the 10,7

cm Solar Flux». (Solar - Terrestrial Predictions, Eds P.A. Simon, G. Heckman, and M.A. Shea, pp. 118-125. U.S. Deptm. of Commerce, NOAA, Boulder, Co., U.S.A. 1984). Contribution No. 128.

8. A. Angelopoulos and C. Poulakos: «Planetary Influence on Important Solar and Terrestrial Phenomena». (Publications of the Greek Geophysical Military Service, No 133, 66-92, 1988). Contribution No. 129.

9. B. Petropoulos and P. Telonis: «The Lower Atmosphere of Venus after Vegan 1 and 2 Missions». Earth, Moon and Planets, Vol. 43, pp. 45-60, 1988. Contribution No. 130.

10. J. Xanthakis, H. Mavromichalaki, B. Petropoulos, E. Marmatsuri and A. Vassilaki: «A Periodical Analysis of the Cosmic-Ray Diffusion Coefficient and the High-Speed Solar-Wind Streams». Earth, Moon and Planets, Vol. 43, pp. 165-179, 1988. Contribution No. 131.

Meetings - Missions

Dr. C. Poulakos with one month leave of absence and under a fellowship of the Max-Planck-Institut für Astronomie in Heidelberg, visited the cited Institute and collaborated with the relevant staff of the Institute in July 1988.

Dr. C. Poulakos participated in the Symposium on «Solar Activity and Space Research, Possibilities Prospects» organized by the Astronomical Observatory of Pendeli. During the Symposium Dr. C. Poulakos presented the research activities and the research programs of the Center as well as the future prospects.

In the same Symposium took part also Dr. V. Tritakis, as a member of the Scientific Committee of this Symposium as well as a principal speaker with the subject «Interplanetary Space», Dr. B. Petropoulos, Dr. H. Dara-Papamargariti, and Dr. Th. Zachariadis.

Dr. B. Petropoulos attended also the following Meetings:

- 1) International Space Meeting (COSPAR) in Helsinki in July 1988.
- 2) The 21st International Astronomical Meeting (IAU) in Baltimore, U.S.A. in August 1988.

Dr. Petropoulos was also invited by the CNRS of France to go to the Observatory of Meudon and to collaborate with staff of the Institute.

1989

Publications:

1) J. Xanthakis, H. Mavromichalaki, and B. Petropoulos: «Time Evolution of Cosmic-Ray Intensity Modulation». (Solar Physics, Vol. 122, pp 345 -363, 1989). Contribution No. 132.

2) J. Xanthakis: «Statistical Analysis of the Large Earthquakees of the Present Century». (Praktika of the A.E., Vol. 63, 1989). Contribution No.133.

3) J. Xanthakis, Y. Liritzis: «Spectral Analysis of Archaeomagnetic Inclinations for the last 2000 years». (Earth, Moon, and Planets vol. 45, pp.139-

151, 1989). Contribution No. 134.

4) B. Petropoulos, A. Georgakilas, D. Gauthier, A. Coustenis, B. Bezard «Physical Parameters for the Atmosphere of Uranus». (Adv. Space Res. vol. 10, pp109-112, 1989). Contribution No. 135.

5) B. Petropoulos, C. Macris: «Physical Parameters of the Martian Atmosphere». (Earth, Moon, and Planets, Vol. 46, pp. 1-30, 1989). Contribution No.136.

6) B. Petropoulos-C. Poulakos: «The Distribution of Solar Flares for the Time Period 1967-1985». (Earth, Moon and Planets, Vol. 46, pp. 107-125, 1989). Contribution No 137.

7) Y. Liritzis: «Greek Archeomagnetic Intensities: Some Aspects of Reliability and Geophysical Implications». (Earth, Moon and Planets, Vol. 47, pp. 1-13, 1989). Contribution No.138.

Meetings - Scientific Missions

Dr. V. Tritakis participated in the 5th Panhellenic Meeting of Physicists held in Athens, December 1989.

Dr. V. Tritakis with a leave of absence visited the Observatory of Pic-du-Midi, France as well as the Laboratory of the same Observatory at Bagneres-de-Bigore and collaborated with the staff of the laboratory on a mutual research program.

Dr. B. Petropoulos participated in the following meetings:

- a) In the 1st Pannellenic Geophysical Meeting held in Athens, April 1989.
- b) In the International Meeting «Philosophy and Kosmospace», held in Kreta, Greece, May 1989
- c) In the Panhellenic Meeting «Applications with Laser», held in Athens. This meeting was organized by the University of Athens.
- d) In the International Meeting «Philosophy-Physics-Space» held in Bulgaria, September 1989.
- e) In the International Meeting «Environmental Pollution» held in Patras, October, 1989
- f) In the 5th Panhellenic Meeting of Physicists, held in Athens, December, 1989.

During the above cited meetings Dr. B. Petropoulos presented some papers of his own and some in collaboration with other members of the staff of the Center.

Dr. B. Petropoulos with a leave of absence visited the Observatory of Meudon and collected data for the Center's research programs.

Dr. H. Dara-Papamargariti participated in the 5th Panhellenic Meeting of physicists, held in Athens, December 1989. She also visited the Astrophysical Laboratory of Paris with a leave of absence from the Center from 8th September till 23rd September 1989.

Dr. H. Dara sent two papers of her own and her collaborators to the IAU

Meeting (Symposium No.138) which presented by her collaborators and they will be published in the proceedings of the Symposium.

Dr. Y. Liritzis participated in the following Meetings:

- a) In the 1st Panhellenique Geophysical Meeting, held in Athens, April 1989.
- b) In the 3rd International Meeting on «Thera and the Aegean World III» held in Santorini, Greece, September 1989, sponsored by the «Thera and Aegean World Foundation» London (owned by P. Nomikos) and co-organized with the three other Greek Institutions.
- c) In the 5th Panhellenique Meeting of Physicists, held in Athens, December, 1989.

During the above cited meetings Dr. Y. Liritzis presented some papers of his own and some in collaboration with other researchers. These papers will be included in the Praktika of these meetings.

The Director of the Center

Dr. C.P. POULAKOS

DEPARTMENT OF GEODETIC ASTRONOMY

UNIVERSITY OF THESSALONIKI

ANNUAL REPORT 1981 - 89

Publications: The following publications appeared in the years 1981 - 89:

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

No. 35: Asteriadis, G., Mahmoud, F., Mavridis, L.N.: 1981, Photoelectric Observations of the Flare Star AD Leo in 1976. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 1906.

No. 36: Asteriadis, G., Mahmoud, F., Mavridis, L.N.: 1981, Photoelectric Observations of the Flare Star BD+16° 2708 in 1976. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 1907.

No. 37: Mavridis, L.N., Asteriadis, G., Panov, K.P., Tsvetkov, M.K.: 1981, Photoelectric Observations of the Flare Star EV Lac in 1980. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2022.

No. 38: Tsioumis, A., Fricke, W.: 1981, A Contribution to the Kinematics of the Gould Belt. *Astronomy and Astrophysics* **75**, 1, 1979.

No. 39: Contadakis M.E., Solf, J.: 1981, Spectroscopic Study of the Infrared Ca II Triplet in S-Type Mira Variable Stars. *Astronomy and Astrophysics* **101**, 241.

No. 40: Contadakis, M.E., Mahmoud, F.M. Mavridis, L.N., Stavridis, D.: 1982, Photoelectric Observations of the Flare Star DO Cep in 1975. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2088.

No. 41: Mavridis, L.N., Asteriadis, G., Mahmoud, F.M.: 1982, Long-Term Changes of the Flare Stars EV Lac and BY Dra. *Compendium in Astronomy. A Volume Dedicated to Professor John Xanthakis on the Occasion of Completing Twenty-five Years of Scientific Activity as Fellow of the National Academy of Athens*, eds. E.G. Mariolopoulos, P.S. Theocaris, L.N. Mavridis, Reidel, Dordrecht, p. 253.

No. 42: Panov, K.P., Pamukchiev, I., Christov, P., Asteriadis, G., Mavridis, L.N.: 1982, Photoelectric Observations of the Flare Star EV Lac in 1981. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2128.

No. 43: Mavridis, L.N., Asteriadis, G.A., Tsvetkov, M.K.: 1982, Photoelectric Observations of the Flare Star EV Lac in 1981. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2133.

No. 44: Mavridis, L.N., Varvoglis, P.: 1982, Photoelectric Observations of the Flare Star BY Dra in 1979. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2174.

No. 45: Asteriadis, G., Contadakis, M.E., Mahmoud, F., Mavridis, L.N., Stavridis, D., Varvoglis, P.: 1982, Photoelectric Observations of the Flare Star

EV Lac in 1976. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No.2183.

No. 46: Asteriadis, G. 1982, Observations of Flare Star Candidates and Discovery of Flare Activity on the dM4e Star Gliese 487. *Astronomy and Astrophysics* **113**, 165.

No. 47: Mavridis, L.N., Varvoglis, P.: 1982, Photoelectric Observations of the Flare Star BY Dra in 1977. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No.2209.

No. 48: Asteriadis, G., Avgoloupis, S., Mavridis, L.N., Varvoglis, P.: 1982, Photoelectric Observations of the Flare Star BY Dra in 1980. Commission 27 of the I.A.U., Information Bulletin on Variable Stars, No. 2210.

No. 49: Tsvetkov, M.K., Mavridis, L.N., Asteriadis, G.A.: 1983, Photoelectric Observations of the Flare Star EV Lac in 1982. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2340.

No. 50: Panov, K.P., Asteriadis, G., Mavridis, L.N.: 1983, Photoelectric Observation of the Flare Star EV Lac in 1982. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No.2358.

No. 51: Panov, K.P., Asteriadis, G., Mavridis, L.N.: 1983, Photoelectric Observations of the Flare Star UV Cet in 1982. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No.2359.

No. 52: Asteriadis, G., Avgoloupis, S., Mavridis, L.N., Varvoglis, P.: 1983, Photoelectric Observations of the Flare Star EV Lac in 1980. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2408.

No. 53: Tsvetkov, M.K., Mavridis, L.N., Asteriadis, G.A.: 1983, Photoelectric Observations of UV Ceti. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2437.

No. 54: Mavridis, L.N., Asteriadis, G., Mahmoud, F.M.: 1983, Long-Term Changes of the Flare Activity and the Quiet-State Luminosity of the Flare Stars EV Lac and BY Dra. *Transactions of the I.A.U., XVIII B, Highlights of Astronomy*, ed. R.M. West, Reidel, Dordrecht, Boston, and London, p. 91.

No. 55: Tsvetkov, M.K., Anton, A.P., Mavridis, L.N., Asteriadis, G.A.: 1984, Photoelectric Observations of AD Leonis. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2618.

No. 56: Mavridis, L.N., Avgoloupis, S.: 1986, The Flare Star EV Lac. I. The Activity Cycle. *Astronomy and Astrophysics* **154**, 171.

No. 57: de Jager, C., Heise, J., Avgoloupis, S., Cutispoto, G., Kieboom, K., Herr R.B., Landini, M., Langerwerff A.F., Mavridis, L.N., Melkonian, A.S., Molenaar, R., Monsignori-Fossi, B.C., Nations, H.L., Pallavicini, R., Pirola, V., Rodonò, M., Seeds, M.A., van den Oord, G.H.J., Vilhu, O., Waelkens, C.: 1986, Simultaneous Optical and X-Ray Observations of a Flare on BY Draconis. *Astronomy and Astrophysics* **156**, 95.

No. 58: Mavridis, L.N., Avgoloupis, S.: 1986, The Activity Cycle of EV Lac. *Transactions of the I.A.U., XIX B, Proceedings of the XIXth General Assembly*,

Delhi 1985, ed. J.P. Swings, Reidel, Dordrecht, Boston, Lancaster and Tokyo, p. 217.

No. 59: Avgoloupis, S., Mavridis, L.N., Varvoglis, P.: 1987, Photoelectric Observations of the Flare Star EV Lac in 1985. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 2997.

No. 60: Avgoloupis, S., Mavridis, L.N., Varvoglis, P.: 1987, Photoelectric Observations of the Flare Star BY Dra in 1985. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No.2998.

No. 61: Avgoloupis, S., Mavridis, L.N., Varvoglis, P.: 1987, Photoelectric Observations of the Flare Star EV Lac in 1983. Commission 27 of the I.A.U., Information Bulletin on Variable Stars No. 3016.

No. 62: Mavridis, L.N., Avgoloupis, S.: 1987, The Flare Energy Spectrum of EV Lac. *Astronomy and Astrophysics* **188**, 95.

No. 63: Mavridis, L.N., Avgoloupis, S.: 1988, Variation of the Flare Energy Spectrum during the Activity Cycle of the UV Cet-Type Stars. Activity in Cool Star Envelopes, Proceedings of the Conference on «Activity in Cool Star Envelopes», Troms, July 1-8, 1987, ed. O. Havnes. B.R. Pettersen, J.H.M.M. Schmitt, and J.E. Solheim p. 65.

No. 64: C. de Jager, J. Heise, A.M. van Genderen B.H. Foing, I.V. Ilyin, D. Kilkenny, S. Avgoloupis, L. Mavridis, G. Cutispoto, M. Rodonò, M.A. Seeds, Yuen K. Ng., W. van Driel, X. Rabattu, A.M. Zodi, J. W.S. Vilas Boas, E. Scalise, R.E. Schaal, P. Kaufmann and C. Waelkens: 1989, Coordinated Observations of a Large Impulsive Flare on UV Ceti. *Astronomy Astrophysics* **211**, 157, 1989.

No. 65: L.N. Mavridis, N.S. Nikolov, S.I. Avgoloupis, and P.P. Varvoglis: The Cepheid 1162 Aquilae. *Astronomy Astrophysics Suppl. Ser.* **80**, 279, 1989.

II. Publications of the Department of Geodetic Astronomy, University of Thessaloniki:

No. 6: Mavridis, L.N., Arabelos, D., Karrinti, I.: 1980, The Gravity Field of Northern Greece. I. Eastern Macedonia and Western Thrace. *Proceedings, Academy of Athens*, **55**, 372.

No. 7: Mavridis, L.N. Arabelos, D., Karrinti, I.: 1980, The Gravity Field of Northern Greece. II. Western Macedonia. *Proceedings, Academy of Athens* **55**, 419.

No. 8: Bandellas, A., Savaidis, P.: 1981, Some Considerations of the Temperature Dependence During Electromagnetic Distance Measurements, *Survey Review* **XXV**, 368.

No. 9: Bandellas, A., Stavridis, D., Savaidis, P.: 1981, An Electronic Device for the Determination of Temperature During Electromagnetic Distance Measurements. *The Australian Surveyor* **30**, 473.

No. 10: Arabelos, D., Karrinti, J.M., Mavridis, L.N.: 1982, Establishment of a First Order Gravity Network in Northern Greece. *Proceedings of the International Symposium on Geodetic Networks and Computations of the International Association of Geodesy, Commission X: Continental Networks*,

Munich, August 31 to September 5, 1981, Volume II: Objectives of Geodetic Networks, Status Reports, Future Plans. Veröffentlichungen der Deutschen Geodätischen Kommission bei der Bayerischen Akademie der Wissenschaften Reihe B, Heft Nr. 258/II, München p. 69.

No. 11: Bandelas, A., Savaidis, P., Ifantis, J.: 1982, Establishment of a Baseline over the Sea. Proceedings of the International Symposium on Geodetic Networks and Computations of the International Association of Geodesy held in Munich, August 31 to September 5, 1981, Volume IV: Modern Observation Techniques for Terrestrial Networks. Veröffentlichungen der Deutschen Geodätischen Kommission bei der Bayerischen Akademie der Wissenschaften, Reihe B, Heft Nr. 258/IV, München p. 166.

No. 12: Arabelos, D., Mavridis, L.N., Tziavos, I.: 1982, Gravimetric Geoid Determination for the Area of Greece. Sun and Planetary System, Proceedings of the Sixth European Regional Meeting in Astronomy, Dubrovnik, October 19-23, 1981, eds. W. Fricke, G. Teleki, Reidel, Dordrecht, p. 203.

No. 13: Mavridis, L.N.: 1982, Terrestrial Refraction and Vertical Temperature Gradient (Invited Paper). Sun and Planetary System, Proceedings of the Sixth European Regional Meeting in Astronomy, Dubrovnik, October 19-23, 1981, eds. W. Fricke, G. Teleki, Reidel, Dordrecht, p. 519.

No. 14: Gounaris, A.I., Mavridis, L.N., Papadimitriou, A.L.: 1982, Terrestrial Refraction and Vertical Temperature Gradient in the Area of Thessaloniki. Sun and Planetary System, Proceedings of the Sixth European Regional Meeting in Astronomy, Dubrovnik, October 19-23, 1981, eds. W. Fricke, G. Teleki, Reidel, Dordrecht, p. 523.

No. 15: Savaidis, P.: 1982, A Study of the Refractivity N of the Air in the Area of Athens. Sun and Planetary System, Proceedings of the Sixth European Regional Meeting in Astronomy, Dubrovnik, October 19-23, 1981, eds. W. Fricke, G. Teleki, Reidel, Dordrecht, p. 529.

No. 16: Bandelas, A., Gounaris, A., Mavridis, L.N.: 1982, Establishment of a High-Precision Gravity Network in the Area of Thessaloniki. Zeitschrift für Vermessungswesen 107, 493.

No. 17: Torge, W., Mavridis, L.N., Arabelos, D.: 1982, High-Precision Gravity Network in the Aegean Region. Proceedings of the International Symposium on the Hellenic Arc and Trench, Athens, 8-10 April 1981, Volume II, p. 361, Athens.

No. 18: Bandellas, A., Gounaris, A., Mavridis, L.N.: 1983, The Dependence of Terrestrial Refraction on the Meteorological Conditions. Paper presented to the XVIIIth General Assembly of the International Union of Geodesy and Geophysics, Hamburg, August 15-27, 1983, I.A.G. Section I.

No. 19: Arabelos, D., Karranti, J.M., Mavridis, L.N.: 1983, Establishment of a High-Precision Gravity Network in the Area of Eastern Macedonia. Paper presented to the XVIIIth General Assembly of the International Union of

Geodesy and Geophysics, Hamburg, August 15-17, 1983, I.A.G. Section III.

No. 20: Mavridis, L.N., Savaidis, P., Tsioumis, A.C., Tziavos, I.N.: 1983, Astronomical Determination of the Deviation of the Vertical in Various Areas of Greece. I.: Measurements in Central Macedonia during the Year 1980. Proceedings, Academy of Athens 58, 401.

No. 21: Mavridis, L.N., Tsioumis, A.C., Tziavos, I.N.: 1983, Astronomical Determination of the Deviation of the Vertical in Various Areas of Greece. II: Measurements in Western Macedonia and Peloponnese during the Year 1981. Proceedings, Academy of Athens 58, 415.

No. 22: Bandellas, A., Gounaris, A., Mavridis, L.N.: 1986, The Dependence of Terrestrial Refraction on the Meteorological Conditions. Allgemeine Vermessungs-Nachrichten, International Edition 3, 38.

No. 23: Torge, W., Mavridis, L.N.: 1986, A High-Precision Gravity Network in the Area of the Aegean Plate. Second WEGENER/MEDLAS Conference, held at the Dionysos Satellite Observatory, May 14-16, 1986, Hellenic Committee of Geodesy and Geophysics.

Miscellaneous: Prof. L.N. Mavridis was elected effective April 6, 1989 President of the Board of Trustees of the European Association of Users of Satellites in Training and Education Programmes (EUROSTEP).

The Head of the Department

Prof. L.N. MAVRIDIS

LABORATORY OF ASTRONOMY

PHYSICS DEPARTMENTS, UNIVERSITY OF IOANNINA

REPORT FOR THE YEARS 1981 - 1989

Staff: The staff of the Laboratory of Astronomy on December 31, 1989 consisted of the following persons: 1) Professor G. Banos, head of the Laboratory as well as of the Division of Astro- Geophysics, 2) Dr V. Tsikoudi, assistant professor (as of 1982), 3) Dr. Ph. Krommidas, lecturer (as of 1982), 4) Mrs H. Dimou- Drosou, secretary, 5) Mr Ch. Nakas, technician.

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

Dr. V. Tsikoudi taught courses in Astronomy to the fourth - year undergraduate students of Mathematics.

Dr. Ph. Krommidas taught courses in Astronomy to the fourth-year undergraduate students of Physics and courses in Teaching of Physics to the third-year undergraduate students of Physics.

Research: Prof. G. Banos worked on solar phenomena.. He spent during the second semester of 1989, six months at the «Kiepenheuer Institut für Sonnenphysik» in Friburg, Germany, on Sabbatical.

Mrs. H. Dara completed her research work on solar surges and received her Ph. D. in 1982, under the supervision of Prof. G. Banos. Mr. Th. Zahariades worked on Ellerman bombs and related phenomena and received his Ph. D. in 1983, under the supervision of Prof. G. Banos and C. Alissandrakis.

Dr. V. Tsikoudi observed flare stars and RS CVn stars, photoelectrically, at Stefanion Observatory (Corinth). In 1983 and then again in 1986, she went to the United States for six months (on each occasion), on sabbatical, and worked on the following projects: Observed flare stars at McDonald Observatory, using the 36" telescope, did photographic photometry of SO galaxies, using the PDS microdensitometer at the University of Texas. She spent some time at the Smithsonian Astrophysical Observatory, in Cambridge Mass, using HEAO B observations for the study of X-ray emission from galaxies. She also went to the infrared Processing and Analysis Center (IPAC) at CALTECH, Pasadena, to use the IRAS observations for the study of infrared emission from flare stars.

Dr. V. Tsikoudi spent one month in 1988 at Rutherford Appleton Laboratory in Chilton, England, where she worked on the far-IR emission from Post-T-Tauri stars, using the IRAS data-base. In the summer 1988, she spent three months in the United States, attending the IAU meeting in Baltimore and the IAU Colloquium on «Solar and Stellar Flares» in Stanford. In addition, she spent one month at IPAC, CALTECH, Pasadena, working on IRAS observations of chromospherically active main-sequence stars.

Dr. V. Tsikoudi worked also on far-infrared emission of solar-type stars and

of ring galaxies using the IRAS Observations.

Dr. V. Tsikoudi attended the European Regional Astronomical meeting in Tenerife, Spain and the IAU Colloquium on «Flare Stars in Star Clusters», at Byurakan Observatory, Armenia, USSR at 1989.

All members of the Astronomy Laboratory spent time working on the Dourouti Astronomical Station using the 24" telescope and tutoring Astronomy students with observing projects.

Dr. Ph. Krommidas completed his work on statistical analysis of radio observations of galaxies in cooperation with the University of Innsbruck, Austria and received his Ph. D. in 1981.

Miscellaneous: In 1982 the Department of Astronomy was merged with the Meteorology Department to form the Division of Astro- Geophysics, one of the four divisions, within the Physics Department of the University of Ioannina.

Prof. G. Banos became head of the division of Astro-Geophysics in 1982 and has held this position ever since. Prof. G. Banos spent three months at the Meudon Observatory, on Sabbatical, during 1983. He also attended the annual meeting of the JOSO Board in Basel, Switzerland (1987) as well as the annual meeting of the JOSO Board in Stockholm, Sweden (1988).

Professor G. Banos resigned and retired from his post at the University of Ioannina, on October 9, 1989.

Dr. V. Tsikoudi attended several Astronomy Conferences while on sabbatical in the United States. She also attended the IAU meetings in Patras during 1982 and in India during 1985. She participated in the IAU Colloquium on «Bright Stars and Associations» held in Porto Heli (Greece), during 1986 and in Conference on «Activity in Cool Stars», held in Tromsø Norway, during 1987. She visited several Astronomical institutes in Poland during 1983, within the framework of the scientist - exchange program between Greece and Poland.

Publications: 1) Banos, G. and Dara-Papamargariti, H.: Dynamical behaviour of surges. *Astron. Astroph.* 120, 181-184, 1983.

2) Mouradian, Z. et al. (Banos, G.): Photospheric and chromospheric magnetic field structure. *Proceedings of the Japan-France Seminar on the active phenomena in the outer atmosphere of the Sun and Stars*, p. 63, Paris 1983.

3) Fang, C., Mouradian, Z., Banos, G., Dumont, S. and Pecker, J.C.: Structure and physics of solar Faculae. *Solar Physics*, 91, 61-70, 1984.

4) Dolfus, A., Banos, G. et al.: Imagerie quantitative des oscillations photosphériques. *C.R. Acad. Sc. Paris*, t. 298, Serie II, no 17, 735-740, 1984.

5) Banos, G.: General Astronomy (textbook), Ioannina, 1985.

6) Banos, G.: Elements of Astronomy and Space Science (textbook), Athens, 1986.

7) Zachariadis, Th., Alissandrakis, C. and Banos, G.: Observations of Ellerman bombs in Ha. *Solar Physics*, 108, 227-236, 1987.

8) Banos, G. and Dolfus, A.: Direct observation of the solar oscillatory structure through the birefringent filter FPSS at Meudon Observatory. Vol. in

memorial of D. Kotsakis, Athens 1988, p. 37.

9) Tsikoudi, V.: The Quiescent X-ray Emission from Flare Stars». Bulletin of the American Physical Society, Vol. 26, No 4, April. 1981.

10) Tsikoudi, V.: HEAO 1 Observations of Quiescent X-ray Emission from Flare Stars, *Asrophys. J.*, 262, 263, 1982.

11) Krommidas, Ph., «Statistics Under Incomplete Knowledge of Data» in Monthly Notices of the Royal Astronomical Society, *MNRAS*. 198, 281, 1982.

The Head of the Laboratory
G. Banos

UNIVERSITY OF CRETE

Division of Astrophysics and Space Physics

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The Division of Astrophysics and Space Physics was incorporated as part of the Physics Department in 1986. The Division also operates a small observatory on Mt Ida, on which a separate report follows.

A. Faculty

Joseph Ventura, Professor

Vasilis Xanthopoulos, Professor

Nikos Kylafis, Associate Professor

Jannis Papamastorakis, Associate Professor

Kanaris Tsinganos, Associate Professor

Christos Haldoupis, Assistant Professor

Efthimios Paleologou, Visiting Assistant Professor

B. Technical Personnel

Kyriaki Xylouri, technician and observer at the Skinakas observatory.

C. Graduate Students

F. Mavromatakis, K. Pavlakis, E. Protosyngelos, G. Sourlatzis.

Scientific activity

- C. Haldoupis was on sabbatical leave from January through August. He was a visiting scientist at the Max-Planck Institute for Astronomy at Lindau, Germany.

- N. Kylafis was on sabbatical leave from January through August 1989. He was a Visiting Scientist at the Space Telescope Science Institute in Baltimore, USA from January through April 1989, where he collaborated with Colin Norman on Astronomical Masers. From May through August 1990, he was a Visiting Assistant Professor at the University of Chicago, where he collaborated with Don Lamb on Accretion onto Magnetic White Dwarfs.

- K. Tsinganos travelled on June 14 - June 19, to Torino Italy, for seminar at the Observatory of Torino and scientific collaboration with A. Ferrari, E. Trussoni, S. Massaglia on Modeling Astrophysical Plasma Equilibria. June 20 - June 25, to Heidelberg, Germany, for the invited talk Topological Solutions for Collimated MHD Flows, at the IAU Symposium 140 on Galactic and Extragalactic Magnetic Fields, published by Kluwer Academic Publishers.

October 26 - October 31, to Gainesville, Florida, USA, for the invited talk, Nonlinear Models of Astrophysical Winds in the 5th Florida Workshop in Nonlinear Astronomy: Nonlinear Astrophysical Fluid Dynamics, published by the New York Academy of Sciences.

On 24 Sep. - Oct. 5, Dr. Trussoni, from Torino, visited us for collaboration on the subject of Modeling Astrophysical Plasma Equilibria. On 2 Sep. - Sep. 10, Professor Ferrari, from the University of Torino, and Director of the Observatory of Torino, visited us for collaboration on the subject of Modeling Astrophysical Plasma Equilibria.

During July and August J. Ventura was a visiting scientist at the Max-Planck Institute for Space Physics in Garching, where he collaborated with H. Ogelman on X-ray radiation from cooling pulsars, and with H. Herold and H. Ruder at the University of Tübingen on the Photoelectric Opacity in Strong Magnetic Fields. In September J. Ventura participated at a three-week workshop in Trieste on «Condensed Matter Properties of Neutron Stars», where he reported on Magnetic Opacities in Neutron-Star Atmospheres.

- V. Xanthopoulos presented the following talks during 1989

- (i) International conference in General Relativity and Gravitation, GRG 12, Boulder, Colorado: Invited talk at the Workshop on Exact Solution: «Collisions of Gravitational, Electromagnetic, and Hydrodynamic waves» (July).

- (ii) Enrico Fermi Institute, University of Chicago: Self-gravitating axion fields (July).

- (iii) University of Rome (I): Two black holes attached to strings (November). He further participated in a three week school on Computer Algebra in Rio de Janeiro (July-August).

- F. Mavromatakis and K. Xylouri attended the 2nd EADN School on Astrophysics (Theory and Observations of Stellar Evolution), Ponte de Lima, Portugal, September 1989. Mavromatakis further spent the period July-December at the Max-Planck Institute for Space Physics, Garching specializing on techniques and data reduction in observational X-ray astronomy.

THE ASTRONOMICAL OBSERVATORY ON MOUNT SKINAKAS

A collaborative project of the University of Crete, the Research Center of Crete and the Max Planck Institut fuer extraterrestrische Physik

A. Installations on Skinakas (Altitude 1750 m at the Ida mountain chain, 60 Km road, 90 min. drive by car from Heraklion).

Buildings: An observatory and a residential building for up to 15 visitors.

Scientific equipment: A 30 cm flat-field telescope with a CCD camera system (Thomson CCD chip 386X574 pixels, cryogenically cooled with liquid N₂).

Field of view on the CCD-Chip: 35X45 arcmin² eg. wide flat field which is

very useful for the observation of extended objects like galaxies and comets, wide band UBVR_I and small band interference Filters (for O III, H α , H β).

B. Installations in Heraklion

2 Workstations (a SunSpark 1+ and a SUN 3/60) running the IRAF and MIDAS astronomical packages.

Publications

- C. Haldoupis,

«A review on radio Studies of auroral E region ionospheric irregularities», Ann. Geophys., 7, 238-259, 1989.

- C. Haldoupis, M.J. McKibben, J.A. Koehler, and G.J. Sofko,

«50 MHz backscatter observations in the Polar cap ionospheric E region», Nato Advanced Study Institute (ASI) Series, on Electromagnetic Coupling in the Polar Clefts and Caps, p. 435-447, Eds, Kluwer Academic Publishers, Dordrecht, 1989.

- C. Haldoupis and E. Nielsen,

«Very large phase velocities of non - two stream meter scale irregularities in the high latitude E region ionosphere», J. Geophysical Research, 94, 13489 - 13504, 1989.

- C. Haldoupis and E. Nielsen,

«140 MHz Auroral Backscatter: Evidence for characteristic phase velocities below and above the ion acoustic speed», Geophys. Res. Lett., 16, 723-726, 1989.

- C. Haldoupis,

«A review on radio Studies of auroral E region ionospheric irregularities», AGARD, (Advisory Group for Aerospace Research and Development) Conference Proceeding No, 441, on Ionospheric Structure and Variability on a Global Scale and Interaction with Atmosphere and Magnetosphere, April, 1989.

- A. Mastichiadis, N. Kylafis and J. Ventura,

«Supernova 1987A: Envelope Metallicity and the Nature of the Soft X-ray Component», Astr. Ap. Letters, 208, L11 (1989).

- N. Kylafis and S. Phinney,

«Smearing of X-ray Oscillations by Electron Scattering», Conference Proceedings of the NATO/ASI on «Timing Neutron Stars», eds. H. Ogelman and E. van den Heuvel, (Dordrecht: Kluwer), 731 (1989).

- I. Papamastorakis, G. Paschmann, W. Baumjohann, B.U.O. Sonnerup, H. Luhr

«Orientation, Motion, and other properties of flux transfer event structures on September 4, 1984», J. Geophys. Res., 94, 8852-8866 (1989).

- K. Tsinganos and B.C. Low,

«Steady Hydromagnetic Flows in Open Magnetic Fields. II Global Flows with Static Zones», Astrophysical Journal, 342, pp. 1028-1048, (1989).

- K. Tsinganos,

(invited paper): «From Exact Solutions in MHD to Chaos», in turbulence and Nonlinear Dynamics in Magnetohydrodynamic Flow, M. Meneguzzi, A. Pouquet and P.L. Sulem (eds.) (AMsterdam: North Holland, 1984), pp. 207-220.

- R. Rosner, B.C. Low, K. Tsinganos and M.A. Berger,
«On the Existence of Globally Ordered Magnetic Flux Surfaces»,
Astrophysical and Geophysical Fluid Dynamics, (1989).
- K. Tsinganos and E. Trussoni,
«Analytical Studies of Collimated Astrophysical Winds» I. Topologies of
2-D Hydrodynamic Solutions», Astronomy and Astrophysics, 231, pp. 270-276
(1989).
- T. Maile, H. Herold, A. Rebetsky, H. Ruder, J. Ventura,
«Towards a Self-consistent Description of Accretion Columns», Astron.
Astrophys., 223, 251, (1989).
- J. Ventura, (Invited Review)
«Radiation form Cooling Neutron Stars», in timing Neutron Stars eds. H.
Ogelman and E. van den Heuvel, (Dordrecht: Kluwer), pp. 491-502, (1989).
- T. Papacostas and B.C. Xanthopoulos,
«Collisions of gravitational and electromagnetic waves that do not develop
curvature singularities», J. Math. Phys. 30, 97-103, 1989.
- S. Chandrasekhar and B.C. Xanthopoulos,
«Two black holes attached to strings», Proc. R. Soc. Lond. A.423, 387-400,
1989.
- B.C. Xanthopoulos,
«Linear perturbations of plane polarized plane waves I: the absence of purely
incoming perturbations», J. Math. Phys. 30, 2626-2637, 1989.
- B.C. Xanthopoulos and T. Zannias,
«Einstein gravity coupled to a massless scalar in arbitrary spacetime
dimensions», Phys. Rev. D40, 2564-2567, 1989.
- K. Mastronikola and B.C. Xanthopoulos,
«Interplay between linearity and nonlinearity in General Relativity: Scalar
fields, perfect fluids, and Einstein spaces, Classical and Quantum Gravity, 6,
1613-1626, 1989.