

ANNUAL REPORTS
OF THE
ASTRONOMICAL INSTITUTES
OF GREECE
1960

PUBLISHED BY THE GREEK NATIONAL COMMITTEE FOR ASTRONOMY

ACADEMY OF ATHENS
RESEARCH AND COMPUTING CENTER
ATHENS
1961

FOREWORD

The Greek National Committee for Astronomy is taking the initiative to group and publish in English, beginning with the first year of this decade, the Annual Reports of the Astronomical Institutes and the University Astronomical Departments of this country. In view of the trends and the prevailing conditions it is felt that the interest of this publication will mark from year to year significant progress.

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Annual Reports for the year 1960 of:

The Astronomical Institute, National Observatory of Athens
The Academy of Athens' Research and Computing Center
The Department of Astronomy, University of Athens
The Department of Astronomy, University of Thessaloniki
The Department of Astronomy, Technical University of Athens

REPORT ON THE ACTIVITIES OF THE ASTRONOMICAL INSTITUTE, NATIONAL OBSERVATORY OF ATHENS DURING 1960

The activities of the National Observatory of Athens and the astronomical station at Penteli, during 1960, may be summarised as follows:

I.— OBSERVATORY OF ATHENS

1.— Solar Observations. Routine photospheric observations (sunspots, faculae, etc.) were carried out on clear days by projection of the image; chromospheric phenomena, i.e. prominences and flares, were registered by means of a Halle polarising monochromatic filter.

Observers were Dr. C. Macris, Mr. A. Haimis, Mr. J. Focas, Mr. D. Elias, and Mr. G. Banos.

Dr. Macris and Mr. Banos have studied solar granulation and obtained some 10,000 photographs of the Sun; they used filters in three colours with the 40cm Gauthier—Doridis refractor of the Observatory. The same have continued their work in preparing Ursigramms which were subsequently communicated to Darmstadt.

Mr. Elias continued his work on solar granulation in the program of Dr. Bartlett Jr.; he has secured 262 observations. He has further prepared and submitted:

- a) To the Solar Division, A.A.V.S.O. three reports on sunspots.
- b) To Prof. Glessberg a report on the program «Foreshortening and Assymetry of Sunspots».
- c) To Dr. J. Bartlett, Jr., three reports on the granulation program.
- d) To the Zurich Observatory a report on sunspot observations.
- e) To the Fraunhofer Institute a copy of the daily solar tracings by projection, obtained from January 1st until December 31st, 1960.

2.— Chronometer and Hour—Signal Division. Observations were made daily by Mr. Haimis, Dr. Macris, Mr. Focas, and Mr. Elias who were responsible for the routine reception of the Pontoise hour-signal. The exact time was communicated, as in the past, to Government Departments, the State Railways, the Public Electricity Concern, the Telephone and Telegraph Organisation, to industries, private individuals, etc.

Meridian observations with the 18 cm Gauthier meridian—circle and the 10 cm. transit—instrument by Troughton and Simms, were limited to a minimum through shortage of personnel.

3.— Equatorial Observations. The 40 cm Gauthier Doridis—refractor was used for a series of observations by Mr. Focas and Mr. Elias who made seven visual observations of comet Burnham (1959 K.). Positions and brightness were measured. Furthermore Mr. Focas took five plates of certain regions of the Moon and made visual and photographic observations of the major planets. Mr. Elias made three micrometer measurements to determine the position of Nova Herculis 1960 and took five photographs to this effect; he likewise secured 427 observations of variables, 14 of occultations by the Moon, and 7 visual estimates of the positions and brightness of comet Burnham (1959 K.).

4.— Sightings of Earth-satellites. Using a theodolite given by the U.S. Air Research and Development Command, Mr. Elias obtained 3951 positions of earth-satellites and made 230 estimates of brightness. These data were communicated to the Smithsonian Astrophysical Observatory, the U.S.S.R. Academy of Sciences and the Department of Scientific and Industrial Research, Radio Research Station, England.

5.— Laboratory Activities Dr. Adamopoulos measured the screw of the measuring machine for astrographic plates constructed by Charles Riddell. Mr. Focas continued with this machine measurements on the Jupiter plates taken in 1958 in view of determining the exact rotation period and he made composite positive pictures by using 80 plates. Mr. Elias measured with the Hartman microphotometer 10 plates of the polar areas of Mars, and secured one thousand measurements. With the measuring machine constructed by Charles Riddell he determined the cords, diameters, etc. of the Sun on the partial solar eclipse of December 2, 1956. One hundred pictures were used and two thousand measurements were made. Same for the eclipse of October 2, 1959 with one hundred pictures and two thousand measurements.

6.— Computations. Dr. Adamopoulos computed calendar—data for 1961 as well as the time of the principal phases of the eclipse of February 15, 1961, which was seen as partial in this country; in collaboration with Mr. Haimis he reduced his measurements of the screw of the Charles Riddell measuring machine and showed that the error in the median region is negligible.

Reductions and calculations of observations on the Sun, planets, comets and earth—satellites were made by the respective observers.

7.— Preparations of the Instruments for Observing the Solar eclipse of February 15, 1961. A 80 mm Zeiss refractor belonging to the Department of Astronomy of the University of Athens was made available by Professor Plakidis, with two short—focus, 50 mm, Dalmayer cameras and a Novaflex camera. The support of the telescope was adjusted to suit the latitude of the island of Hvar, selected as a station of the Greek observers. Several pieces of auxiliary equipment were constructed to meet various requirements and this work was carried out in the workshop of the Observatory by its technicians, Mr. E. Sigalas, and Mr. Ch. Economides. They were supervised by Professor Plakidis and Dr. Macris.

The members of the Greek eclipse expedition which was headed by Professor Xanthakis of the Academy of Athens were Dr. Macris, Mr. Elias, and Mr. Banos, and the observational program included timing the phases of the eclipse and photographing the inner and outer corona with the four cameras and using infra—red, red, orange, green, and blue filters.

The last quarter of the year 1960 was taken up practically with the preparations, packing and shipping the instruments and the necessary lengthy formalities.

8.— Work in Foreign Observatories. A grant was awarded by the OEEC to Dr. Macris who spent two months visiting the observatories of Meudon, Utrecht, Uccle, and Freiburg. Mr. Focas visited, beginning of December 1960, the observatories of Meudon and Pic du Midi, as a special consultant of the Jet Propulsion Laboratory, California Institute of Technology.

Professor Plakidis, Director of this Institute, Dr. Adamopoulos and Dr. Macris, attended on invitation the «Corfu's Summer School on the Upper Atmosphere» held under the auspices of NATO's Science Committee from June 28 until July 17.

9.— Publications. A number of publications were made by the members of the staff. These are:

S. Plakidis. Annual Report on the Activities of the Astronomical Institute of the National Observatory of Athens in 1959. Bulletin of the Geographic Service of the Army (in press).

S. Plakidis. Astronomy in Modern Greece, Athens 1960.

C. Macris. Correlation Between the Number of Photospheric Granules and Sunspots. Memoire of the National Observatory of Athens, Series I, Astronomy No 7.

C. Macris. Sur la Durée de vie des Spicules dans les Centres d'Action de la Chromosphère Solaire, Praktika of the Academy of Athens, vol. 35, pp. 82 - 86, 1960.

J. Focas. Bright Spot on Saturn, Circular I.A.U. No 1727.

J. Focas. Observations of Comet Burnham (1959 K.), Circulars I.A.U. No 1726 and 1728.

J. Focas. Apparition d'une tache Brillante sur Saturne en 1960 et phénomènes de forte perturbation atmosphérique sur cette planète qui l'ont suivie. Praktika of the Academy of Athens.

J. Focas. Resultats de Mesures de diamètres des Satellites des Grosses Planètes a l'aide de micromètre birefringent de la station astronomique de Pentéle. Praktika of the Academy of Athens.

J. Focas. Travail de Physique planétaire, effectué à l'Observatoire National d'Athènes en 1958 - 1960. Draft Report Comm. 16, I.A.U.

J. Focas. Jupiter. An article in the Supplement of the Greek Encyclopaedia.

D. Elias. Nova Herculis 1960, Circular I.A.U. No 1728.

D. Elias. Visual Estimates (extrafocal) of Comet Burnham (1959 K) Circular I.A.U. No 1729.

D. Elias. Observations of Comet Burnham (1959 K) Circular I.A.U. No 1728.

10.— Educational and popularising activities. The fourth—year students in Physics and Mathematics of the University of Athens have, as in the past, received their usual practical training in this Observatory and the station at Penteli. This was given them by the personnel of the Department of Astronomy of the University. Towards the end of the academic year the Observatory was visited by the students in Physics and Mathematics of the University of Thessaloniki; they were accompanied by Dr. Contopoulos, professor of Astronomy of that University.

Several foreign astronomers visited this Observatory in 1960. These were Professor Dr. E. Schoenberg, Professor D. Menzel, Dr. C. Pecker, Dr. R. Colomb, Dr. D. H. Sadler, Dr. V. Blanco, Dr. C. Copen, and others.

Over one thousand visitors in groups or isolated visited this Observatory as well as over two thousand high-school students from the Athens area and the provinces.

Furthermore several lectures were given by the members of the staff, in Athens, the Piraeus, and other cities and towns of the country. Their object was to educate the public and increase public interest as well as promote scientific research in Greece.

II.— ASTRONOMICAL STATION OF PENTELEI

During 1960 Mr. C. Hasapis has made the following observations and investigations:

- 1) The routine 8 a.m. meteorological observation and its reductions.
- 2) The routine daily chronometer—service.
- 3) The monitoring of old novae with the 63 cm Newall refractor and observations of 96 variables with smaller instruments.
- 4) Eleven observations of double-stars with the birefringent micrometer attached to the 63 cm Newall refractor.
- 5) Twenty-four photographs of the Sun with the Zeiss 11 cm heliograph.
- 6) Theodolite sightings of earth-satellites.
- 7) Investigation of faint formations in the photosphere from observations made from 1946 until 1958.
- 8) Supervision of constructions and various technical chores; the principal were: a) The construction of steps leading from the foot of the hill to the station. Expense was covered by funds made available by government agencies and the local municipal authorities. b) Plastering and oil-painting the building housing the Newall refractor. c) Installing phone connections between the buildings of the station.

Mr. Focas made a number of visual, photographic and polarimetric observations of Venus, Mars, Jupiter and Saturn with the 63 cm Newall refractor; he also used the birefringent photometer to determine from 250 measurements the diameters of the classical jovian satellites. He also made 10 measurements of Titan.

Mr. Elias made one hundred observations of variables with the same telescope, five observations of occultations by the Moon, one photometric and one photographic observation of Nova Herculis 1960, and seven double-star observations with the birefringent micrometer. He also made forty-four determinations of position and twenty of brightness of earth-satellites with the theodolite of the U.S. Air Research and Development Command.

The Newall obsolete mechanical drive and right—ascension hand-control have been replaced. An electric drive and electric right-ascension control were installed by Mr. E. Sigalas, technician of the Observatory of Athens.

The requirements of the station at Penteli in furniture were covered during 1960. The camera was completed and a small workshop for carrying out minor repairs and maintaining and cleaning the instruments was installed.

Apart from the visiting scientists already mentioned, 877 visitors visited the station at Penteli in 1960, as well as 1044 high-school students from over the country; the station was visited also by one hundred high-school teachers of Mathematics from over Greece who participated to a mathematical convention.

The Director of the Astronomical Institute of the National Observatory of Athens: Prof. S. Plakidis

ACADEMY OF ATHENS RESEARCH AND COMPUTING CENTER ATHENS ANNUAL REPORT FOR THE YEAR 1960

The «Research and Computing Center, Academy of Athens» was established in October 1959. It belongs to the Academy of Athens (Division of Natural Sciences) and its purpose is to promote science in the fields of Astronomy and Applied Mathematics. Dr. John Xanthakis, member of the Academy of Athens, has been elected by the Senate of the Academy Supervisor of the Center,

Personnel. Dr. L. N. Mavridis has been appointed Director of the Center and assumed his duties on June 13, 1960. Mr. M. Chondros has been appointed Secretary of the Center and assumed his duties on July 11, 1960. Besides the permanent staff other scientists from both Greece and abroad may work at the Center on specific research programs.

Equipment. One electrically—operated adding and subtracting calculator Brunsviga mod. 111R and one hand-operated multiplying and dividing calculator Brunsviga mod. 13RK have been acquired.

Also the acquisition of the following instruments has been rendered possible thanks to a grant from the Royal Research Foundation: 1) one iris-photometer of the type proposed by Prof. W. Becker, to be constructed by Askania-Werke, Offenbach/Main (West Germany) and 2) one stereomicroscope, to be constructed by Carl-Zeiss, Oberkochen/Württ. (West Germany).

Scientific Programs. The research activities of the Center extend at present to the following fields:

- 1) Joint observational programs in collaboration with observatories possessing the appropriate telescopes.
- 2) Statistical studies on different astronomical subjects, based on published observational data.
- 3) Theoretical studies on different problems of Astronomy and Applied Mathematics.

During 1960 the following research programs were carried out:

- 1) Statistical Study of Solar Activity (Dr. J. Xanthakis). This study is based on the sunspot areas and the relative sunspot—numbers, data published by the Royal Greenwich Observatory and the Eidgenössische Sternwarte, Zürich.
- 2) Lifetimes of the Chromospheric Spicules (Dr. C. Macris). This work is based on spectroheliograms taken at the Osservatorio Astrofisico di Arcetri.
- 3) Photoelectric Photometry of Galactic Cepheids (Dr. L. Mavridis in collaboration with Dr. K. Bahner). The observations were made with the 72 cm. reflector of the Landessternwarte auf dem Königstuhl, Heidelberg.
- 4) Distribution of the M-, S- and C-Type Stars in Selected Areas of the Milky Way (Dr. L. Mavridis partly in collaboration with Dr. J. J. Nassau and Dr. V. Blanco). The observational material used in this programs has been taken with the 24 $\frac{1}{2}$ inches Schmidt telescope of the Warner and Swasey Observatory, Cleveland, Ohio.

Publications. The following publications appeared till the end of 1960. Contributions from the Research and Computing Center, Academy of Athens, Series I (Astronomy):

- No 1 : J. Xanthakis, L'expression de l'activité solaire en fonction du temps d'ascension. Annales d'Astrophysique t. 22, p. 855 - 876, 1959.
- No 2 : J. Xanthakis, Les aires des taches solaires vers le nord et le sud de l'équateur du Soleil en fonction du temps d'ascension. Comptes rendus des séances de l'Académie des Sciences (Paris) t. 249, p. 1315 - 1317, 1959.
- No 3 : J. Xanthakis, L'asymétrie N-S dans l'activité solaire. Comptes rendus des séances de l'Académie de Sciences (Paris) t. 249, p. 1458 - 1459, 1959.
- No 4 : C. Macris, Sur la durée de vie des spicules dans les centres d'action de l'activité solaire. Praktika de l'Académie d'Athènes, t. 35, p. 82 - 86, 1960.
- No 5 : K. Bahner und L. N. Mavridis, Lichtelektrische Zweifarben-photometrie galaktischer Cepheiden. Veränderlichen Kolloquium 1959,

Kleine Veröffentlichungen der Remeis Sternwarte Bamberg Nr. 27, S. 18 - 19, 1960.

No 6 : L. N. Mavridis, S- and C-Type Stars in NGC 7789. Publications of the Astronomical Society of the Pacific v. 72, p. 48 - 49, 1960.

No 7 : J. Xanthakis, The Sunspot Areas and the Relative Sunspot Numbers. Geofisica Pura e Applicata, Milano v. 46, p. 11 - 22, 1960.

Miscellaneous. Dr. J. Xanthakis attended the «Corfu's Summer School on the Upper Atmosphere» held under auspices of the NATO's Science Committee and the «Symposium on the Numerical Treatment of the Ordinary Differential Equations Integral and Integro-Differential Equations» organized in Rome by the Provisional International Computation Center. He also visited the Specola Vaticana, Castel Gandolfo and the Osservatorio Astrofisico di Arcetri

L. N. Mavridis

ANNUAL REPORT OF THE DEPARTMENT OF ASTRONOMY UNIVERSITY OF ATHENS FOR 1960

1.— General. The activities of the Department of Astronomy, University of Athens, may be thus described : a) The full Professor, Dr. S. Plakidis, and the Assistant—professors teach astronomical theory to the fourth—year students of Physics and Mathematics. b) The chief assistant with the assistants instruct these students to the theory and use of the astronomical instruments, and, c) all efforts are made to promote Astronomy through research and publications.

2.— Tuition. During the academic year 1959 - 1960 Professor Plakidis, who is the Head of the Department, delivered a course in Mathematical and Physical Astronomy.

Dr. D. Cotsakis, assistant—professor, has given a course in Celestial Mechanics.

Dr. W. Abbott, assistant—professor, initiated in 1960 a course in Astrophysics, on the atmospheres of the planets and interspace travel.

3.— Exercises and Training. The students are trained in practical Astronomy, the use of the instruments and the reduction of data by the personnel of the Department as follows :

Chief—assistant, Mr. Catsis, trained the students to the use of the sextant, the theodolite, the meridian telescope, etc.

Assistant, Mr. Mantzaris, trained the students to the equatorial telescope, the photometers, the zenith—telescope, and the monochromatic filters.

Special assistant, Mr. V. Cotsakis, trained the students to the practices of spherical Astronomy, and was subsequently replaced by Mr. Ch. Frangakis.

The number of students trained, during 1960 were :

Section of Physics, fourth-year students :	87
Section of Mathematics, fourth-year students :	93
Total	180

4.— Seminar. A seminar is held in the Department every year in order to instruct the staff of the Department and the graduates who work in the Department as volunteers. This was continued in 1960 on various subjects :

- 1) Professor Plakidis opened a discussion on the «Perspectives and the future of the station of Penteli».
- 2) Professor Contopoulos discussed «The Third Integral of the Motion of the Galaxy».
- 3) Assistant—professor Cotsakis discussed the «Problems of the Earth-satellites and Space—research».
- 4) Mr. Catsis chief assistant, discussed the «Mathematical Computations on the Calendar».

5. Lectures. The following public lectures were given by the staff of the Department; their object was to popularise Astronomy and initiate the public to the recent developments in this field of knowledge:
a) Professor Plakidis lectured in the hall of the «Friends of the People Society» on the «Investigations of Space surrounding the Earth».
b) Assistant—professor Cotsakis lectured twice in the same hall, once on «Two outstanding scientists during the Ottoman rule in Greece», and once on «The New Space Age».
c) Mr. Catsis, chief—assistant, lectured on the «Mode of calculating the Easter Calendar» in the hall of the Mathematical Society.

6.— Publications. Dr. Cotsakis, assistant—professor, published a book on the «Investigation of Space», new edition, pages 150, corrected and improved. He likewise published «The Earth—satellites and Space», a communication presented at a scientific and educational convention held by the teachers of Mathematics of Crete, at Irakleion, Crete, in May 1960. It was published in the Bulletin of the Hellenic Mathematical Society, 1960.

Dr. W. Abbott, assistant—professor, completed the processing of data collected at the Geophysical Institute of the University of Alaska, College, Alaska, during the IGY, on cosmic and auroral hydrogen. The results were published in a paper in *Geofisica Pura e Applicata*, Milano, vol. 45, 1960 - 61, pp. 167 - 174.

Mr. Catsis, chief—assistant, has written a paper on the «Theory of the Solar and Lunar Eclipses» which has been sent for publication to the Bulletin of the Geographical Service of the Army.

The Head of the Department
Prof. S. Plakidis

ANNUAL REPORT OF THE ASTRONOMICAL DEPARTMENT UNIVERSITY OF THESSALONIKI 1960

1. General.

By the end of 1960 the new building of the Astronomical Observatory of the University of Thessaloniki was completed.

The main instrument of the Observatory is a 20 cm refractor made by Secretan, Paris, housed in a 6 m dome.

The Observatory includes the offices of the Astronomical Department, a Library, a Lecture-room, spare rooms for Laboratory work, two rooms for night observers etc. It is a 3 story building, including the basement, and covers an area of 220 m.

2. Instruments.

1) A photoelectric photometer made by Knott, with amplifier and a recorder.

2) An heliostat made by Geartner.

The equipment of the Astronomical Department also includes :

- a) A precision Seconds-Pendulum-Clock made by Riefler.
- b) Two small telescopes.
- c) A few theodolites, sextants, clocks etc. Further two moonwatch telescopes for earth—satellite observations have been donated by the Academy of Sciences of the U.S.S.R.

3. Staff.

The chief—assistant of the Astronomical Department, Dr. L. Mavridis, has resigned in June 1960, after being appointed Director of the Research and Computing Center of the Academy of Athens.

Mr. B. Barbanis, who served until now as assistant, was promoted to chief—assistant.

Another assistant, Mr. G. Bozis, was appointed in July by the Royal Research Foundation.

The Staff includes a servant, Mr. A. Karantzas.

4. Scientific Work during 1960.

Dr. Contopoulos and Mr. Barbanis have worked on the problem of the third integral of motion in a Galaxy. Mr. Barbanis has applied this integral on the velocity space, using calculations made by the electronic computers, BESK in Stockholm and Mercury in Manchester.

Dr. Contopoulos and Mr. Bozis have worked on the problem of the Collisions of Galaxies. The problem has been laid down for numerical computation by the IBM 650 electronic computer in Athens. This work is supported by the Royal Research Foundation.

5. Publications.

Under the series : Contributions from the Astronomical Department of the University of Thessaloniki have appeared :

Nr. 6 : G. Contopoulos : A Third Integral of Motion in a Galaxy, Zeitschrift für Astrophysik 49, 273 - 291, 1960.

6. Library.

The Publications of the Astronomical Department are exchanged with the Publications of over 150 Institutes and Observatories. However our Library is far from being complete.

7. Observations.

A few visual Observations of earth—satellites have been made during 1960.

The time-service has worked regularly.

8. Lectures.

The 3rd year Students of Mathematics and Physics follow a three hours course in Spherical Astronomy and a one hour—course in Practical Astronomy. The 4th year Students follow a five hours course in Astrophysics and Celestial Mechanics and a one hour course in Practical Astronomy.

About 80 Students follow each course. The same students have practical exercises with the Astronomical Instruments.

About forty 4th year Students of the Natural Sciences follow an abridged course in Astronomy.

Dr. Contopoulos has also given a one hour course in Relativity Theory (Special and General), and a three hours course in General Mathematics and Statistics.

The Director of the Astronomical
Department : Prof. Dr. G. Contopoulos

PROCEEDINGS FOR 1960 OF THE DEPARTMENT OF ASTRONOMY NATIONAL TECHNICAL UNIVERSITY OF ATHENS

Director : Professor Dr. John Argyrakos

Instruments.

The main instrumentation of this Department consists of :

- 1) Universal Instrument Wild T4 fitted with an impersonal micrometer.
- 2) Wild T2 Theodolite with astrolabe.
- 3) Wild T3 Theodolite with astrolabe.
- 4) Time Signal Receiver FAVAG.
- 5) Chronograph.
- 6) Sextants.
- 7) Zeiss-Jena Equatorial of 160 mm with all accessories.
- 8) Complete set of Meteorological Instruments.

9) Several appliances for educational purposes. During the year 1960 we have obtained :

- 1) 2 Chronometers Ulysse Nardin (No 10151 and 10103).
- 2) 1 Chronograph Ulysse Nardin (No 10001).
- 3) 2 Binoculars Zeiss-Jena 6X30 and 15X50.

We are expecting :

- 1) Doppelkreis-Thodolit Kern-Suisse DKM-3A.
- 2) Chronostat III Leroy & Cie Paris.

Lectures

The students (total number : 40) in the third and fourth year of this School are taking theoretical courses of Mathematical, Geodetic and Practical Astronomy.

In the Department they are taking two hours in the week for practical training in the use of instruments, the methods of observations, (determinations of azimuth by observations of Sun and Polaris, of geographical coordinates by the methods of equal zenith—distances of stars the zenith distances of stars etc., and their reduction. This work is carried out within the campus of the Technical University.