

THE ASTROPHYSICAL OBSERVATORY AND THE UNIVERSITY INSTITUTE OF ASTRONOMY IN CATANIA

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To understand the events linked to the establishment of the Astrophysical Observatory and the University Institute of Astronomy, the origin of the University of Catania will be traced.

During the XIV century the Royal Court was hosted, almost uninterruptedly, at Ursino Castle. The Parliament used to sit both at the Castle and the Municipal Palace. In 1416, when Alfonso of Aragon ascended the throne of Spain and Sicily, the seat of the Government was moved to Palermo and in 1434 Alfonso crowned himself king of Sicily in the town's cathedral.

The move of the government to Palermo caused deep consequences in respect to the economical and cultural life of the ionic town and for this reason many petitions were made to move the capital of Sicily back to Catania. However, the king's decision of staying in Palermo remained unchanged. Nevertheless, having accounted the decline of the Etnean town after the loss of the seat of government, together with the loyalty shown by the people and authorities of Catania to the Aragoneses, in 1434, Alfonso decided to choose Catania as seat of the Studium Generale, the present University.

It is useful to recall the leading role the church had progressively gained in the field of education, throughout the Middle Ages. At that time the Studium Generale was, therefore, not intended as a place where all the disciplines were taught, but as an institution for Christian undergraduate students, whose running and granting of baccalaureates and degrees was subject to the Pope's approval.

However, in the meantime, Alfonso, who after Queen Joanna II's death aimed to become king of Naples, quarrelled with Pope Eugenio IV, who instead sided with Renè of Anjou. The Papal bull, in which the Studium Generale of Catania was acknowledged, was issued on October 19, 1445, after that Alfonso, having put the rival claimant to flight, had taken over Naples on April 18, 1444. The University of Catania, thus, could run the academic year in 1445 at the heights of its powers. However, the people of Catania still suffered the damage after the shift of the capital of the island to Palermo. Therefore, on June 9 1445, the king approved a chapter stating [1]: "To no Sicilian will it be permitted to study but in Catania and at no other place will teaching be allowed". This ensured that the teaching of higher education in the entire island was assigned to the University of Catania, a privilege that the people of Catania always attempted to maintain at any cost and that, probably due to the envy felt by other towns, in particular by Palermo, was the cause of the impaired development of astronomy in Catania from the end of the 18th century to the end of the 19th century.

Early in 1737, upon the action of the Theatines and Jesuits of Palermo, the Council of Sicily, which was based in that town and superintended the public education of the island, granted that the

boarders of the two above-mentioned orders and those of the Carolingian boarding school, provided that they were born in Palermo, were not compelled to attend the University of Catania, confirming, however, that they had to sit the exams to get the degree. After the expulsion of the Jesuits, these benefits were granted to the students of the Academy of Sciences of Palermo. Having the Bourbons fled to Sicily and Palermo reassumed the role of capital of the kingdom, on August 22, 1805 the Academy of Palermo was risen to the rank of University and, thus, authorised to grant degrees. The privilege held by the Studium Generale was definitively lost.

In 1780, father Giuseppe Piazzi had arrived in Palermo to teach Calculus at the above Academy and in 1786 a royal decree, establishing the Astronomical Observatory of Palermo, was issued. Piazzi himself projected and supervised its realisation, which was accomplished between the second half of 1790 and the beginning of 1791. In January 1787 Piazzi travelled abroad to visit the most important observatories of that time, in order to improve his knowledge of astronomy. When he came back he took up the position of director of the observatory, which in the meantime had been completed.

In Catania, Astronomy had been included among the subjects taught at the university in 1779, but, contrary to what happened in Palermo, no experienced teacher was soon appointed, also because of the poor remuneration. The course of astronomy, thus, started in 1788 when Vincenzo Zuccarello won the competition held in that year in Naples. When Zuccarello died, king Ferdinando I, ordered that "a young building surveyor should have gone to Pavia to learn the observation techniques, buy the most suitable instruments and, back to Catania, to establish an observatory devoted to the practical teaching of that discipline" as it is inferred from a missive sent by the mathematician Sammartino Agatino to the geophysician Carlo Gemmellaro [2], both from Catania. The deputation of Catania had, for this purpose, nominated Sammartino, but, due to subtle manoeuvres with the Viceroy Prince of Caramanico, the royal decree was revoked. Carlo A. Del Giorno, professor of Algebra went, instead, to Palermo to improve his knowledge of Astronomy at the Piazzi school. When he arrived in Palermo, Del Giorno spread Jacobean propaganda and for this reason was arrested and condemned. He was, thus, replaced by F. Gambino.

Meanwhile, in Catania, astronomy was taught, for one year, by Fortunato Paternò Tedeschi, who was also professor of Metaphysics, and then for other two years by G. Orlando who was lecturer of Geometry. When the latter went back to Palermo the chair of astronomy was assigned to Gambino. He held the position till 1835, but, due to the failed building of the Observatory in Catania, he could only teach Theoretical Astronomy.

On January 31, 1817 the committee of Public Education was set up with the task of separating the economic from the scientific organisation and making the principles, which the Public Education was based on, uniform in the entire island. The committee was charged of the scientific and moral guidance of the education, from elementary to higher school in the whole island. On January

28, 1818 the title and functions assigned to the Committee of Public Education were undertaken by the University of Palermo, whose committee of study had a huge power over the University of Catania. It often happened that the limits of legality were exceeded, although according to the king's intentions, the three universities of the reign Naples, Palermo and Catania had to be considered as equal.

In addition to the damages deriving from the feeling of revenge of the people of Palermo on the university of Catania, other events happened: the reactions of the government to the anti-bourbons revolts in Catania in 1837 (among the martyrs of Catania there were two university professors: Salvatore Barbagallo Pittà, who was shot and Gabriello Carnazza Amari, who was condemned to spend ten years in prison in Niside); the re-establishment of the University of Messina in 1838 (it had been already founded by the Jesuits in 1596 and suppressed in 1679 due to riots) and eventually the reaction to the wide participation of Catania University in the revolts which culminated in the epic days of April 1849. During that period, the university building had hosted the committee of citizens to organise the desperate opposition against the "regi", while in the printing office of the university proclamations, manifestos, leaflets and poetry were printed to spread the ideals of freedom among the people. It is evident that all the attempts made by the people of Catania to obtain an astronomical observatory or the funds necessary to support researchers attending courses abroad or eventually to pay salaries for the teaching of this subject, failed. Giuseppe Zurria, an eminent mathematician, to whom the chance to study abroad to improve his knowledge of astronomical instruments, was denied, gave free lessons of theoretical astronomy from 1842 to 1844. Quite different were the expectations of the people of Catania on the Government of Savoy after the liberation. Many citizens had spilled their blood and sacrificed their freedom and ambitions fighting for liberation.

Casati's law, under the pro-dictatorial Mordini's decree of October 17, 1860, regulated the universities of Sicily and promised a renewal of the higher education system.

In Catania, the university authorities, the Commune, the Province and the same men who, in the previous regime, had fought for their ideas, undertook various and continuous initiatives in order to get a development of the university. However, while in response to Catania petitions, the authorities of Torino promised to take the requests into consideration, Palermo was soon upgraded as a seat of exams. Many professors were appointed to fill the vacancies, the laboratories were renovated and new ones established. Moreover, at the University of Palermo some professors were chosen to take part in the examination board for the competition of the chairs at the University of Catania. At the end, in spite of the assurances from Torino authorities to the various delegations, the results obtained were quite disappointing. In fact in 1862, under De Sanctis' law, the University of Catania was downgraded to second-rank Institution and could not fill the vacancies or qualify graduates for teaching.

The people of Catania reacted positively to this serious situation. The Commune and the Province authorities established an association which, since 1877, had supported the university with a yearly sum of Lit. 30.000. In 1886 the same Commune and Province, by providing the sum of L. 70.000 and L. 40.000 respectively, obtained that the Ministry of Public Education completed the Faculty of Mathematics, Physics, Sciences and promoted the University of Catania to first-order Institution. Under the new agreement, the University of Catania obtained again its ancient role of regional University.

These events have been recalled because in the same period, other circumstances led to the establishment of the Astrophysical Observatory in Catania.

In September 1876, on the occasion of the celebration for the return of Vincenzo Bellini's ashes, the greatest Catania musician, the Gioenia Academy organised a solemn assembly and Pietro Tacchini, an astronomer born in Modena, since 1863 astronomer at the astronomical observatory of Palermo, was invited. Tacchini proposed to celebrate the memorable great musician by calling an observatory, devoted to the study of celestial bodies, after him. This observatory had to be built up to Mt. Etna, at 3000 m a.s.l. Tacchini's proposal was enthusiastically accepted first by the Assembly and finally by the Government itself.

To build an observatory dedicated to Vincenzo Bellini, an association was founded and included the Ministry of Public Education, that of Trade, Industry and Agriculture, the Commune and the Province of Catania. Tacchini was appointed as supervisor of the building works.

The Observatory, completed in 1880 (Fig.1), included, southwards, the so-called "Casa degli Inglesi" (Fig. 2), built nearby the Hut "Gratissima" (Fig. 3) by Mario and Carlo Gemmellaro in 1804 at the foot of the Vulcano. It was called "Casa degli Inglesi" because it was partially funded by some officers of the English Navy, where C. Gemmellaro served as a physician.

From a copy of the agreement dated 30 June 1880 [3] between the Ministry of Public Education and that of Trade, Industry and Agriculture, on the definite arrangement of the Observatory, it can be inferred that the Ministry of Agriculture assigned the responsibility of the Observatory to the Ministry of Public Education. The Observatory was then assigned to the Royal University of Catania.

The role played by Tacchini in paving the way for the establishment of the Observatory was crucial.

Besides the Astrophysical Observatory, the building included the weather station, belonging to the Ministry of Agriculture and some premises, assigned to the chemical physics and vulcanology Professor of Catania University.

A branch in the town was opened to house an equatorial mounting "Cavignato", the same as that used for the 35-cm Merz (fig. 4) refractor on Mount Etna, and some meteorological instrumentation. The cost both for V. Bellini Observatory and Catania branch, would have been equally shared between the Ministry of Education and the Ministry of Trade, Industry and Agriculture, the Commune and the

Province. The estimated annual cost for the two seats (salaries and ordinary equipment) amounted to Lit. 8800.

Catania branch was built in 1885, after the donation of some premises of the Benedictine's ex-Monastery by the Town Council. In 1889 the latter also donated an area of over 4000 square metres in the surroundings in order to build an astrograph dome. In fact, in 1886, the Astrophysical Observatory, thanks to Tacchini, took part in an international project, proposed by the Academy of France, to make a photographic sky map. For this purpose, Tacchini ordered a 33-cm lens from Steinheil in Munich, an equatorial mounting equipped with a 20-cm guiding telescope from Salmoiraghi in Milan, a rotating dome from Audisio in Turin, two bronze photographic chassis and an enlarger from Gautier, a mechanic working at Paris Observatory.

Vincenzo Bellini Astrophysical Observatory belonged to the University and when, in 1890 the chair of Astrophysics, assigned to Annibale Riccò, was established there, for the first time in Italy and perhaps in Europe, the Etnean Observatory was regarded as a scientific institution, joined to the above-said chair.

Following Gaetano Cacciatore's death, in 1889, Riccò, had took up the direction of Palermo Astronomical Observatory for over a year, and once in Catania, he hold the chair of Astrophysics and the position of director of both Vincenzo Bellini Astrophysical Observatory and its branch; he also undertook the direction of the Meteorologic Observatory and the Geodynamic Institute, hosted in the town branch.

In spite of Riccò and Tacchini's enthusiasm and hope in V. Bellini Observatory, Catania Astrophysical Observatory progressively became the main seat. The reasons for it are clearly described in A. Riccò's letter addressed to the Rector of Catania University, dated July 7th, 1916 [4]:

The Etnean Observatory is a branch of Catania Observatory for the following reasons:

- 1) *The Etnean Observatory has remained in the background for the remarkable developments of Catania Observatory in Meteorology, Geodynamics and Celestial Photography.*
- 2) *By experience it has been shown that, since the sky visibility in Catania is excellent, there is no relevant advantage in carrying out astronomical observations on Mount Etna, at a height of 2950 m, where the frequent atmospheric condensation and volcanic gases veil the stars.*
- 3) *It would not be safe to leave the instruments' lenses, amounting to several thousands of liras, exposed to the volcano's dangers (the central crater is just one kilometer away from the Observatory); taking the lenses from Catania to Mount Etna and back as well as assembling and disassembling them has turned out to be difficult and dangerous; therefore it is better to take them to the Etnean Observatory rarely and only for special studies to be carried out at that altitude.*
- 4) *The moderate amount of Lit. 3500 could not be sufficient to support both Observatories, especially the Etnean one which, exposed to the severity of the bad weather and to the volcano's dangers, often requires necessary repairings.*

5) There is no indemnity for the Observatory's staff working at the Etnean Observatory, in peculiar conditions, therefore the cost of living turns out to be very high.

6) Even according to the lamented founder, Prof. Tacchini, the Etnean Observatory was not intended to be a permanent residence of the staff; in fact, besides a big round room for the refractor and a room for seismic instruments, there is just a sleeping-room for the astronomers and one for the custodian, one laboratory and one room for other purposes.

It follows a description of the available facilities.

In order to describe Riccò's widely documented activity, we just mention the solar photosphere and chromosphere monitoring (the latter was carried out in the K line of CAII, with a Toeffer spectroheliograph, bought also with the contribution of Chicago William E. Hale Institution) and the collection of the plates of the Astrophotographic Catalogue and of the photographic sky map, which was nearly complete when he died in Rome on September 23rd, 1919.

After Riccò's direction the Meteorologic and the Geodynamic Observatories split from the Astrophysical Observatory. Vittorio Balbi took up the direction of the latter until 1924, except for a short period during July 1922, when Bortolo Viaro was director. In fact, he died soon after his arrival from Florence. When he went to Catania the Chair of Astrophysics (Natural Sciences) was changed into Chair of Astronomy (Physics and Mathematics). The activities carried out at the Astrophysical Observatory during that period include: in 1921 the construction, by Mentore Maggini, of an Anderson interferometer [5] for studying the narrow binary stars and, in October 1922, the systematic measurement of the solar chromosphere's height.

Meanwhile the Etnean Observatory had been abandoned by the astronomers and when, following the Ministry of Education Decree of December 31, 1923, the R. Astronomical Observatories came under the authority of the above Ministry, Catania Astrophysical Observatory (OACT), by the end of 1924, was under the authority of the Ministry of Education while the Etnean Observatory (V. Bellini) was under the authority of the University, which assigned it to the Vulcanology Institute in 1925.

The OACT's direction was assigned to G.A. Favaro followed by the direction of Azeglio Bemporad in July 1933. Among the main events during the academic year 1925-26, Astronomy was changed into Astronomy and Geodesy at the University and, at the OACT, G.A. Favaro and S. Taffara took part in the observation campaign of the minor planet Eros.

In the academic year 1933-34, Azeglio Bemporad was the appointed Professor of Astronomy and Geodesy at the University. In 1938 he was sent off for racial reasons. Therefore Astronomy was taught by Cataldo Agostinelli in 1939 and by Alfonso Consiglio in 1941 and in 1945.

In 1944, Azeglio Bemporad was reinstated as director of the OACT, but on February 11, 1945, he died. After Bemporad was sent off, the Astrophysical Catalogue was continued by Luigi Taffara, under the direction of Favaro, director of Trieste Astronomical

Observatory. Even during Catania bombardment the solar monitoring was continued by Taffara.

After Bemporad's death, Eugenio De Caro was appointed as director of the OACT and taught Astronomy and Geodesy. In 1953 De Caro's abilities fit him for the Chair of Astronomy but, due to the sufferings he bore when he was kept prisoner in Germany, he died on March 2, 1954.

After Piero Tempesti, in April 1954, Mario Girolamo Fracastoro took up the direction of the OACT.

During the academic year 1955-56 Fracastoro obtained the re-establishment of the chair of Astronomy and the establishment of the course of Geodesy. He was appointed as full Professor of Astronomy and obtained the re-establishment of the Institute of Astronomy at the OACT. In 1959-60 the courses of Astrophysics and Space Physics were reactivated and activated, respectively. In 1965, the University of Messina obtained a temporary appointment of Astrophysics thanks to Fracastoro. Under his direction, the OACT revived. The existing instruments were improved and new ones bought; photoelectric photometry as well as the study of eclipsing binaries, were introduced; a thorough survey was carried out in order to open a station for night observations; two temporary stations were opened. On June 28, 1966, on the occasion of the X Sait (Società Astronomica Italiana) Meeting, held in Catania, the Observatory and the Astronomy Institute at "Città Universitaria", and the Stellar Station at Serra La Nave, 1725 m above sea level, were inaugurated.

Thanks to Fracastoro's initiative a large part of the library was rearranged and the main instruments of the OACT bought. At the beginning of the academic year 1966-67 Fracastoro left Catania to be appointed as director of Torino Astronomical Observatory. On March 14, 1967 Giovanni Godoli took up the direction of the OACT. He completed, developed and efficiently organised the work done by Fracastoro. A new Zeiss interferential filter and a coronagraph for observing the Sun in the H α line were bought; in order to study the stellar flares an original three-colour simultaneous photoelectric photometer [6] was built; the library was greatly developed, the equipment of the workshop was improved and new guest-quarters built at Serra La Nave Station. Under Godoli's direction, the study of sun-type stellar activity and of chemically peculiar stars was carried out. The OACT took part in the JOSO (Joint Organisation for Solar Observations) and OAN projects (Osservatorio Astronomico Nazionale). The following subjects were added to official courses: Radio astronomy (1970) and Electromagnetic waves (1976), at the University of Catania, and Astronomy at the University of Messina.

The OACT and the Institute of Astronomy included only one astronomer, a graduate technician and two assistants, respectively. Under Godoli's direction the number of employees at the OACT increased; when Godoli left Catania, in 1977, the OACT staff comprised seven astronomers, two graduate technicians and three assistants.

During 1977 Paolo Maffei took up the direction of the OACT and held the chair of Astronomy. In 1980 he moved to the University of

Perugia. During his direction, the 91-cm and 61-cm telescopes of Serra La Nave Station were improved and the workshop developed.

After Maffei, S. Cristaldi was appointed as director until August 3, 1981, followed by Carlo Blanco until 1986 and subsequently by Marcello Rodonò. In 1980 the OACT co-operated with the Institute of Physics in the study of the interaction between interplanetary matter and ions.

An echelle spectrograph, 40 Å/mm low dispersion and 2-9 Å/mm crossed dispersion, covering the 3450-6600 spectral range, was bought.

In 1987, in order to develop the study on the interaction between interstellar and interplanetary matter and ions, an Experimental Astrophysical Laboratory was opened and a Fourier spectrograph for the infrared, was bought.

During the nineties the observational, experimental and theoretical lines of research were developed; a group operating in the field of cosmology is being formed. The instruments were developed and in 1992 Serra La Nave Station housed an automatic telescope with an 80-cm mirror for photoelectric photometry. In 1994 the following instruments were bought: a CCD for the direct acquisition of the images of the Sun in the H α light and a 30 Kev ionic gun, which may be implemented up to 200 Kev, in order to update the Experimental Astrophysics Laboratory.

The study being carried out at the OACT electronics laboratory in co-operation with the Institute of Astronomy, on the quality and optimisation of the detectors for the SUV satellite and for the Galileo telescope should also be mentioned as well as the development of computing facilities comprising: a C/210 Convex (64 Mbyte RAM) , a Microvax as server, about ten workstations and about thirty PCs, 486 and 386.

The direction of the Institute of Astronomy had been assigned to S. Catalano since 1977 and to M. Rodonò in 1983. The latter, having been appointed as full Professor of Astronomy in 1986, also took up the direction of the OACT. It was the first time that the direction of both the OACT and the Institute of Astronomy was assigned to the same person. In 1993 Lucio Paternò was appointed as Director of the Institute of Astronomy.

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Historical data, if not specified, refer to the volume "History of the University of Catania - From the origins to nowadays", printed on the occasion of the V centenary of the University of Catania, in 1934, by the Zuccarello & Izzi printer of Catania. For further details on the 1953-1981 period refer to [7].

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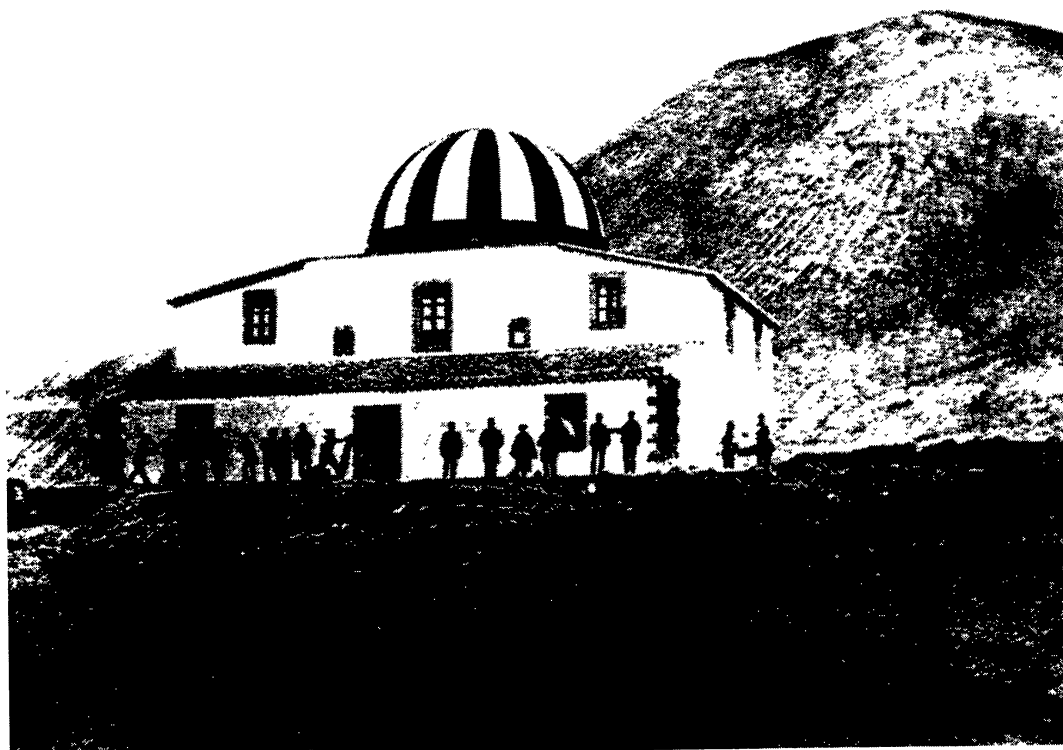


Fig. 1. Vincenzo Bellini Observatory, as it was in 1932



La « Casa inglese » (m. 2942 s/m) con a fianco la « Gratissima ».
(Da disegno di Sartorius von Waltershausen fatto nel 1835).

Fig. 2. "Casa degli Inglesi", in a drawing by Sartorius von Waltershausen, 1835



LA GRATISSIMA

Fig. 3. "La Gratissima", in an engraving by S.Ittar