ROMANIAN WOMEN DEVOTED TO THE CELESTIAL VAULT

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Abstract. The International Year of Astronomy was marked by several interesting projects, among which there was a very special one, namely "She is an astronomer". Indeed, it was necessary for us to remember how many women contributed to the progress of world astronomy since the ancient times.
Actually, how many of them were there? This is hard to estimate if we go back in time. We are aware of about 20 of them in the Antiquity, of about ten in the Middle Ages and their number increases as we approach the present (also due to more reliable information). Thus, one can count 16 in the 17th century, 24 in the 18th, 94 in the 19th, or even 180, including women in related fields. Today there are over 1700 women astronomers; in addition, there are 20,000 to 30,000 women specialized in related fields. About 16% of the 10,815 IAU members are women members. Romania is rated with a percentage of 32,35%, a relatively smaller figure compared to the period preceding 1989, when it ranked among the countries with the largest number of women astronomers.
A good example to this effect is the direction board of the Astronomical Institute of the Romanian Academy elected in January 1990 was entirely made of women, namely the director (I was director for 15 years, the only woman director in the 105 years of existence of the Astronomical Observatory), the deputy director, the scientific secretary were all women. It is also worth mentioning that throughout history the number of women having contributed to astronomy comes immediately after those who contributed to biology.

Key words: women in Astronomy, Astronomical Observatory of Bucharest , history.

In Romania astronomy is not as old as in other countries. We are talking of course about scientific astronomy. The reasons are obvious: Romania is located at the borderline between the Christian and the Muslim world and had to fight all the time against the calamities of the wars, as well as against many natural calamities. This did not favour the development of science.

That is why, the extraordinary advance made by Romanian civilisation at the middle of the 19th century is really remarkable. Immediately after the Union of the Principalities in 1859, the first universities were created (in 1860 in Jassy, and in 1864 in Bucharest) and soon after the Academy of Science (1866); young people were sent to study abroad at the most famous university centers of Europe and scientific culture registered a remarkable progress.

In Bucharest, Ştefan C. Hepiteş (1851–1922) was appointed director of the Meteorological Institute on the 1st of April of 1884. He became the founder not only of meteorology, metrology, seismology, but also of astronomy. In 1893 he built on the Filaret Hill the first hall for astronomical observations that were necessary mainly for time estimation. He also brought in various astronomical instruments. At the same time astronomical observations were carried out also by women, namely by *Elena B. Vermont, Maria Gogu and Felicia Boerescu*.

Several pages of "L' Astronomie" of 1906 and 1907 were dedicated to the observation notes on Jupiter and, as Jean Mascart, astronomer at Paris Observatory, showed, 36 observers participated in the simultaneous observation of the planet. Among them it is worth mentioning Elena B. Vermont and Felicia Boerescu. Apart from the precision of their observations or the suggestive descriptions that accompany their notes, we have to point out their difficult observation conditions. Thus, on the 4th of February of 1906, the temperature was of 17.7° and, although it was freezing cold, they went on making observations for 14 nights. Just try to imagine them wrapped up so much in the clothes of the time that they could hardly move around their instruments.

When speaking about the role of women in astronomy, one cannot leave aside two illustrious cultural mentors, Romanias Queens Elisabeth and Mary. As a founding member of Société Astronomique de France, Queen Elisabeth of Romania invited the astronomer Camille Flammarion in 1906 at the Peles Castle. His memories of the event are truly touching. The way in which he was received, the Queens love for astronomy impressed him greatly, and he reports all this in the pages of the journal "L' Astronomie" of the same year. In turn, Flammarion invited the other Queen of Romania, Mary, at his Observatory in Juvissy.

The first Astronomical Observatory in Romania dates back from the 1st of April 1908. It was intended for scientific research, under the leadership of Nicolae Coculescu. The first employees there were A. Teodosiu and **Maria Teohari** (1885–1975).

Special attention should be given to one of the most important personalities of Romanian astronomy, namely **Ella Marcus** (1909–1982). She was born in Bucharest a century ago, on the 4th of June of 1909. Her father, the engineer Maximilian Marcus, was the head of the Statistics and Materials Resistence Chair at the National School of Bridges and Highways and was very much in love with astronomy, a passion that he communicated to his daughter. Ella was admitted at the Mathematics Faculty of the University of Bucharest in 1925 and graduated from the university when she was only 20 years old. After wards she left for Sorbonne, where she pursued physics studies, concluded with a thesis on optics.

Passionate about astronomy and extremely hard working, Ella Marcus worked as a volunteer at Paris Observatory in order to get specialized in observation tech-

Fig. 1 – Maria Teohari (1885–1975)

Fig. 2 – Ella Marcus (1909–1982)

niques. After she returned home, Ella Marcus worked as a teacher of mathematics at first at the ”Libros” Highschool for boys, then at the Victoria Highschool for girls, and later at the Commercial School ”Instrucţiunea”. Between 1948 and 1950 she taught mathematics at Highschool No.4.

On the 1st of January of 1949 she was hired as assistant astronomer at the Astronomical Observatory in Bucharest, which at that time was related to the Chair of Astronomy of the Mathematics and Physics Faculty of the University of Bucharest. She taught astrophysics and the theory of astronomical instruments. Throughout

her whole life she worked at the Observatory, which in 1957 became a research institute of the Romanian Academy. She drew up a course of internal usage intended especially for young researchers, who needed to get used to the observations at the meridian refractor and the great equatorial telescope, as well as to the processing of the data or of the photographic cliches obtained.

Between 1949 and1957 Ella Marcus took part in international observation campaigns and finally was appointed head of the "Meridian" working group, in order to complete star catalogues. The Romanian Academy acknowledged the volume and especially the accuracy of this work, which was truly remarkable for that time, and in 1972 awarded her the "Gheorghe Lazar" academic prize.

Her exceptional eye for detail, as well as her excellent scientific training, were coupled with an impressive culture. She was a remarkable pianist, spoke several foreign languages and had a thorough knowledge of literature and philosophy. I would not end this characterisation without mentioning the devotion for her family, which was struck, like many other other Jewish families, especially after the emergence of the legionary movement. Although she was an extremely beautiful woman, she never got married in order to be able to dedicate herself to the people around her, her colleagues included.

At a time when participation at international conferences was almost impossible in Romania, she did her best in order to represent our country in Moscow, Leningrad, Copenhagen, Brighton, Heidelberg, Prague, Paris, Athens, Warsaw, Patras. When she returned from the last congress in August 1982 she was so absorbed in her thoughts, that she no longer payed attention to the traffic, and was run over by a car near the Armenian Church on the 2nd of October. She was immediately admitted to the Emergencies Hospital, but on account of her modest, inconspicuous array, she was left unattended. Only after she passed away, on the 4th of October, a nurse searched into her purse for a telephone number of a relative to let her family know about her. That was the tragic end of a woman who is still revered by the whole international astronomical community.

Her example was followed by other women astronomers. **Cornelia Cristescu** (1928–2005) was one of them. A native of Bukovina (North of Romania), she studied at the Mathematics Faculty of the University of Bucharest, from which she graduated in 1951. At the age of 28 she defended her doctoral thesis under the supervision of Professor Gheorghe Demetrescu. In 1967 they published a monograph which became an important reference for the following generations, called Elements of stellar dynamics. Cornelia Cristescu taught at the above faculty in the following years as well. In the late 60s I was myself one of her assistants.

However, her true vocation was to the research. For over 30 years she worked as a researcher at the Astronomical Observatory in Bucharest. Most of this work involves stellar astronomy, astrometry and evolution of planets, asteroids and planets.

Fig. 3 – Cornelia Cristescu (1928–2005)

She did not spare herself when it came about astronomy. She was so devoted to her work, that she sacrificed even her health in order to contribute to astronomy. Cornelia Cristescu spent the last part of her life in the U.S., working together with her husband, Professor Nicolae Cristescu, member of the Romanian Academy. They worked at the John Hopkins University, Baltimore, then at the University of Florida, on calculation programs or congresses organization, as well as a lecturer.

I have tried to put together a list of the papers and books that she published. For such an activity many others would have long been elected as members of the Academy. The most relevant proof is the last paper she published in 2000, that was presented at the Annual Congress of the European Society of Astronomy by a group of researchers. Her contribution was by far the most important: it consisted in observations gathered year after year on photographic plates, with an astonishing accuracy. She was, in a sense, the Tycho Brahe of the Romanian astronomy.

I shall end the list of these women by mentioning the name of **Emilia Ţifrea** (1929–2007). She was born in Bilbor in the district of Bihor (western county of Romania), but she then moved to Bucharest and Piatra–Neamţ, where her family settled and where she eventually died. Emilia Ţifrea was a collaborator of prof. Clin Popovici since she was an undergraduate student at the Mathematics and Physics Faculty of the University of Bucharest. Until the 3rd of March of 1956 she worked under the supervision of Ella Marcus, but during the International Geophysical Year (1957–1958) her career shifted towards solar physics. She led the solar department from 1965 until she retired in 1985. Also thanks to the Geophysical Year, the Bucharest Observatory was endowed with stellar and solar astrophysical instruments that were

set up in the new domes.

Fig. 4 – Emilia Ţifrea (1929–2007)

It is worth mentioning that almost the entire working group led by Emilia Ţifrea was made up of women, maybe also due to the fact that they preferred the day observations to the night ones. She prepared her doctoral thesis during a training stage at the Ondrejov Observatory, near Prague. The topic of the thesis solar prominences was her favourite field, although she worked on almost every topic related to the active solar regions and to the solar–terrestrial relations. She also investigated the solar eclipses, such as those on 15 February 1961 and 11 August 1999.

Apart from publishing numerous papers, she also co–authored many specialized books, such as the Dictionary of astronomy and astronautics, 1977, The Sun, 1978, The Universe in X Radiation, 1987, The Eclipses, 1999.

It is obvious that I have chosen here only a small number of the many women astronomers who contributed to the progress of this science, so old and so modern at the same time. The list is longer, and hopefully some time in the future a new history of of astronomy will give each of them the place she deserves.

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