

**ACADEMICIAN GHEORGHE DEMETRESCU –
FORTY YEARS SINCE HE PASSED AWAY
(1885–1969)**

On July 15, 1969 died in Bucharest acad. Gheorghe Demetrescu, remarkable astronomer and seismologist, with important contributions and achievements in both Romanian sciences. Acad. Constantin Drâmbă presented the prodigious scientific activity of this famous scientist in a speech pronounced in the Romanian Academy public meeting of July 2, 1992. We extracted some marks on the life and activities of this excellent professor and researcher during more than 55 years.

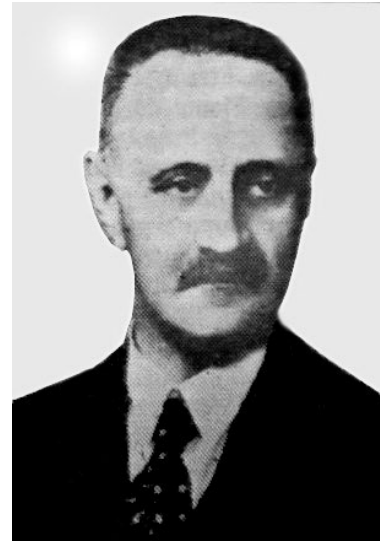
Gheorghe Demetrescu was born in Bucharest on January 22nd, 1885 and he obtained in 1907 the degree in mathematics of the Faculty of Sciences in the University of Bucharest. Here he frequented the courses of some famous professors like Spiru Haret, David Emanuel, Nicolae Coculescu, Gheorghe Țițeica. After obtaining the university degree, in 1908 he was appointed assistant at the Faculty of Sciences and at the Astronomic Observatory of Bucharest, turned up in that year, under the direction of the professor Nicolae Coculescu (Drâmbă, 1969, 1992).

Between 1908–1912 he attended a speciality probation at the Observatory of Paris, where he carried out different studies in the following domains: photometry of variable stars, solar physics on photo and chromospheric phenomena, determination position of small planets and comets by photographic methods, study of astronomic field glass objectives, interpretation of seismograms. Here he elaborated an original method for the study of the astronomic field glass objectives by application of inertia moment of bright points group. By implementing this method, young Demetrescu studied photographic objective of the equatorial in the Observatory of Paris. He elaborated the Stellar Map (for Paris) and later the maps for Bucharest and Cluj. He returned in the country in 1912, where he really participated at the installation of equatorial field glass and later, in 1926, of the meridian field glass at the Astronomic Observatory of Bucharest.

On March 13, 1915, Gheorghe Demetrescu obtained the title of doctor in mathematical sciences of the Faculty of Sciences of the University of Bucharest. He presented the thesis: *About some methods of calculation for Sun eclipse*. As application he computed the total eclipse phases of the Sun from August 20, 1914, for the city of Riga.

During the First World War, the reserve sub-lieutenant Gheorghe Demetrescu received the order for the organization of the meteorologic office in Bucharest and Jassy for the army necessity. He successfully fulfilled this task by the installation of four air stations for the Moldavian front, central station being in Jassy, where the meteo bulletins were diffused everyday for aircraft and artillery (Drâmbă, 1992).

In 1923 he is appointed professor of astronomy at the University of Cluj and director of the Astronomic Observatory. Here, also in Bucharest, he formed numerous astronomers, among these, Drâmbă (1992) mentioned I. Armeanca and I. Curea. In 1928 he returns to Bucharest as prime astronomer and vice-director of the Astronomic Observatory. On this background he carried out a fruitful activity of astronomic studies about Gautier, prime meridian field glass mounted at Bucharest in 1924–1926 period. With this modern apparatus were equipped only observatories of Paris, Bordeaux and Bruxelles. Respective studies were included in the frame of some international scientific programs recommended by the International Union of Astronomy.



Gheorghe Demetrescu was, during twenty years (1943–1963), the director of the Astronomic Observatory of Bucharest, where he carried on a prodigious activity for increasing the efficiency of the obtained results in this research domain. Romania was permanently connected at general international tendencies traced by the International Union of Astronomy.

In our essay we will refer to important contributions of professor Gheorghe Demetrescu in frame of the seismological researchers, connected organization during a long time period with astronomical one. So, București – Filaret seismological observatory (on Silver Knife street) was included in the Astronomic Observatory of Bucharest. This first Romanian seismological station works (still in present day) since 1895 by the efforts of Ștefan C. Hepites, director of the Meteorological Institute of Romania. This excellent meteorologist installed here, in the buildings of the institute, a seismoscope Guzzanti and a seismometrograph Tacchini. Later, in 1902, he assembled two horizontal pendulums Bosch, with mass of 10 kg. These apparatuses with low performances worked since 1908 and later in 1928–1935 period (Petrescu, 1959). In 1914 the station is endowed with two horizontal pendulums Galitsyn, with high sensibility and photogalvanometric recording. These instruments worked until 1937 because of the war and serious financial difficulties. The action owed insurances of professor Octav Onicescu and by financial support of engineer Nicolae Malaxa (Demetrescu, 1937; Rădulescu, 1994).

Gheorghe Demetrescu's seismological preoccupations began in 1929 (or, maybe, before) by the study of the Vrancea earthquake on November 1, 1929 (with $M = 5.8$, Demetrescu, 1929). This seismic event was recorded by 51 seismological observatories in the world and it was studied by known English seismologist Harold Jeffreys. He established a focus depth of 184 km; subsequent estimates supplied values of 160 km (Gutenberg, Richter, 1937), 198 km (Demetrescu, 1939) and 160 km (Constantinescu, Mârza, 1980).

Since January 1, 1935, the seismological activity of Romania marked a reversal by the establishment of the Romanian Seismological Office (in the frame of the Observatory of Bucharest), under leadership of professor dr. Gheorghe Demetrescu (Petrescu, 1959; Demetrescu, 1956; Visarion, 2004). One year before, in 1934, he mentioned the rudimentary endowment of the Bucharest – Filaret observatory and he proposed the construction of some seismographs with three components (with the mass of 500 kg for horizontal pendulum and of 100 kg for vertical pendulum). He solicited financial funds for “creation at the Observatory of Bucharest of a central office for data gathering, study of seismograms and establishment of connection with the International Union of Seismology”. Reorganization of the seismological office endorsed the completion of apparatus endowment of the Bucharest – Filaret observatory. Also, the establishment of some new stations, after the strong earthquake of November 10, 1940 was done at: Focșani and Bacău (1942), Câmpulung – Muscel (1943), and later Iași (1951) and Vrâncioaia (1952), in Vrancea epicentral area (with subcrustal shocks).

In the period 1935 – 1943, seismological activity carried on in difficult conditions. In spite of these difficulties, Demetrescu initiated a systematic study of earthquakes occurred in Romania (Banat county, areas of Câmpulung – Muscel, Râmnicu Sărat and Mărășești) and especially of deep seismic shocks from the seismogenic zone Vrancea. Demetrescu's studies evidenced the deep focus from the bending arc of the Carpathians (Vrancea area); this focus is characterized by persistent and isolation similar of hypocenter from Mts Hindukush (Afghanistan) and Bucaramanga (Colombia). So, Gheorghe Demetrescu studied Vrancea earthquakes produced on November 1, 1929 ($M_s = 5.8$), July 13, 1938 ($M_s = 5.6$), October 22, 1940 ($M_s = 6.2$) and November 10, 1940. Concerning the strong event on November 10, 1940, he drew up the macroseismic map of Romanian and Bulgarian territories (Demetrescu, 1941), where some local maxima appear (approximately 10 degree) in different sites (Lopătari, Neculele, Panciu, Tg. Bujor). The area of maximum intensity (8–9 degrees) extends from Olt and Danube rivers (in SW) to Jassy, in central-northern part of Moldavia. Macroscopic intensities of five degrees were observed at Moscow (1300 km distance of epicenter) and in south-east of Bulgaria (about 300 km distance).

The seismic Bulletin has been published since 1935, half-yearly in the first year, then monthly in the following years until now. This information bulletin contributed establishing connections with more than 130 seismological observatories all over the world and exchanging of scientific publications (Demetrescu, 1937; Petrescu, 1956).

The preoccupations connected to the instrumental endowment of the four Romanian seismological observatories (on 1943) were materialized with mechanic Mircea Marcopol's professional aid. He constructed in the office shop mechanical pendulums with mass of 540, 450 and 150 kg. So, in 1943, he elaborated 13 seismic pendulums constructed by Marcopol (Petrescu, 1956). Horizontal pendulums with mass of 540 kg had static amplification of 170 – 180 times and an air damping system, conceived by M. Marcopol (Demetrescu, 1956). These were equipped with a time recording device (by marking the hour and the minute) by an electric synchronized grandfather's clock.

Another notable contribution of Professor Gheorghe Demetrescu was connected to the determination of the crustal layers thicknesses on the basis of studying the converted waves recorded between *P* and *S* waves on the Vrancea earthquakes seismograms. So, in 1954, together with seismologist Gheorghe Petrescu, he determined the thickness of these layers of the Walachia and Moldavia subsoil. The idea of this method was presented in 1957 by Gheorghe Demetrescu at the first Conference of Seismology of the Czecho-Slovak Academy from Liblice. In the presented example, he determinate thicknesses of 23–41 km for the "granitic" layer and 21–24 km for "basaltic" layer in an area situated at 50 km NNE of Bucharest (Demetrescu, 1958).

Besides the astronomic and seismological researches Gheorghe Demetrescu carried out a teaching activity in the frame of the University of Bucharest (Rusu, 1999). In 1943–1962 he taught the courses of general astronomy, cinematics and dynamics of galaxy, as well as the course of seismology. This one contained 10–15 hours for the 4th year of the Faculty of Sciences (mathematics section). In the chapter "Study of earthquakes" he described the seismicity of Romania, especially the deep focus of the Vrancea area. He presented the determination methods of geographic co-ordinates of epicenter and depth of the focus. Later, he wrote the course of Seismology and Seismometry for the Faculty of Mathematics and Physics of the University of Bucharest.

Professor Gheorghe Demetrescu was elected, in 1948, corresponding member of the Romanian Academy and active member in 1955 (Rusu, 1999). During a period of time he was the president of the Romanian National Committee of Astronomy, representing our country at different meetings of the International Union of Astronomy and the International Union of Geodesy and Geophysics (Drâmbă, 1992). He received the title of honored professor and numerous Romanian and foreign orders and medals given for his scientific and organization activity results.

Forty years after his death, academician Gheorghe Demetrescu may be really considered the founder of the Romanian modern seismological studies. In this period, by international connections with different institutions, Romanian seismologists have been keeping step with world scientific and instrumental realizations, in accord with the recommendation of the International Association of Seismology and the International Union of Geodesy and Geophysics.

In his activity, Prof. Demetrescu understood the importance of seismic events monitoring and so the endowment with a high performance apparatus. He was preoccupied and he contributed to the application of some precise methods for determination of the geographical position of the epicenter and the depth of the seismic focus. He understood the physical phenomena in the propagation process of the seismic waves generated in the earthquake focus. He used this useful information for the calculation of the crustal domains thickness, crossed by the seismic waves. He was an excellent organizer and creator of the Romanian seismological and astronomical school. He was an opening specialist in this research domain, in which Romania was and is in the first line of the world science.

The following generations continued the Demetrescu's studies and they approached new research directions as: seismotectonic elements, focal mechanisms of the crustal and subcrustal earthquakes, geometric, dynamic and cinematic parameters of different seismic sources, premonitory phenomena associated to strong earthquakes, the structure of the crust and upper mantle a.s.o. The results of these complex studies are mentioned in numerous papers, publications, Ph.D. theses, internal and international communications, highly appreciated by the Romanian and foreign specialists.

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