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Mathematics education in Romanian at Babeş-Bolyai University Cluj-Napoca

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Abstract. In this paper, we will present the most important moments of the evolution and development of the mathematical education and research activities in Romanian at Babeş-Bolyai University Cluj-Napoca. The main figures of the mathematical university staff are also presented.

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1. A short walk through the history of the university education in Cluj

On May 12, 1581 the prince Ştefan Bathory decided to set up at Cluj a college with three faculties: Theology, Philosophy and Law. This is the first official attestation of a higher education institution in our city.

After some climbings and descents and a contradictory evolution of the higher education in Cluj, on October 12, 1872 the emperor Ferenc József approves a decision of the Hungarian Parliament for setting up the University of Cluj. This Hungarian university have had four faculties: Law and State Sciences, Medicine, Philosophy, Letters and History and, the last one, Mathematics and Natural Sciences. During this period some pre-eminent mathematicians (such as Gyula Farkas, Lipót Fejér, Frigyes Riesz or Alfréd Haar) have had essential contributions to the development of the Cluj mathematical school.

The great wish of the Romanian nation to have their own university with complete studies in Romanian was finally accomplish after the union of the province of Transylvania with the Romanian principality in 1918. On October 1st 1919, by a decree of the King Ferdinand of Romania, the Romanian University was set up under the same name as before, the University of Cluj. The faculties of the new university were:

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Letters and Philosophy, Sciences, Medicine and Law. Professor Dim. Călugăreanu was appointed the first dean of the Faculty of Sciences, while the first Rector of the new university was elected Professor Sextil Puşcariu. The official opening of the new university took place on February 1-3, 1920 in the presence of King Ferdinand and Queen Mary. The University of Cluj starts its activity with 171 Professors and 2034 students enrolled in four faculties. Meanwhile, the Hungarian University moved to Szeged, Hungary.

The activities of the university were suddenly interrupted, since in August 1940, the nord-west part of Romania (including Cluj) was surrended to Hungary, by a decision took in Vienna under the pression of the German Third Reich. Very fast, the patrimony of the university was moved to Alba-Iulia and Turda. Moreover, the Faculty of Sciences was moved to Timişoara, while the rest of the faculties were moved to Sibiu. All of them start their activities in November 1940.

In 1944, after the defeat of the Third Reich and its allies, the Vienna Dictate was abolish and the nord-west part was re-integrated to Romania. It was also the time of a new start of the University of Cluj. Actually, starting with 1945 two universities will operate in Cluj: a Hungarian university, *Bolyai University* and a Romanian one, re-entitled *King Ferdinand*. In 1948, the Romanian university took its name after the great Romanian biologist *Victor Babeş* and, finally, in 1959, the two universities were unified in a Romanian-Hungarian university called as today *Babeş-Bolyai University*. The Faculty of Sciences was divided in four new faculties: Mathematics and Physics, Chemistry, Geology and Geography and, the last one, Natural Sciences. In 1962, the Faculty of Mathematics and Physics is separated in two faculties, the Faculty of Mathematics-Mechanics and the Faculty of Physics. From 1973 our faculty was re-named the Faculty of Mathematics and, finally, from 1994 it is called the Faculty of Mathematics and Computer Science.

Despite of the vicissitudes of the life, the university education and the research activities in Cluj were permanently on an ascendent slope. The Professors of the Cluj University, regardless of nationality, always worked, with abnegation and responsibility, on the development of the university and for of the perennial values promoted by it.

2. The Faculty of Sciences

In 1919, in the moment of its founding, the Romanian university of Cluj have had five sections:

- Mathematics
- Physics
- Chemistry
- Geography
- Natural Sciences

The Mathematics Section was also divided in several chairs:

- Analytical and Descriptive Geometry
- General Mathematics

- Mechanics
- Function Theory
- Mathematical Analysis
- Algebra
- Astronomy

Between the professors of the Mathematics Section of that years let us mention some important names: Dimitrie Pompeiu, Gheorghe Nichifor, Aurel Angelescu, Gheorghe Bratu, Nicolae Abramescu, George Iuga, Theodor Angheluţă, Petre Sergescu, Dumitru V. Ionescu, Gheorghe Călugăreanu. The Honorary Director of the Mathematical Seminar was Paul Montel, while the Director of the Astronomical Observatory was Gheorghe Bratu.

During the academic year 1938/39 the Mathematics Section of the Faculty of Sciences was performed by the following professors: *Nicolae Abramescu* (Geometry Chair), *Dimitrie Pompeiu* and *Theodor Angheluţă* (Algebra Chair), *Gheorghe Bratu* (Astronomy Chair), *Dumitru V. Ionescu* (Rational Mechanics Chair), *Petre Sergescu* (Differential and Integral Calculus), *Radu Bădescu* (Mechanics Chair), *Gheorghe Călugăreanu* (General Mathematics and Geometry Chair).

From the beginning and up today the mathematical studies in Romanian knew a continuous development not only because the increasing number of students, but mainly based on the performing research and scientific achievements of the mathematical school from Babeş-Bolyai University.

3. The research activity in Mathematics

During the years, the most important research actvities in mathematics were materialized in the following directions:

- Differential and Integral Equations (Gh. Bratu, Th. Angheluţă, P. Sergescu, D.V. Ionescu, Gh. Micula)
- Functional and Difference Equations (Th. Angheluţă, A. Angelescu, G. Iuga, T. Popoviciu, F. Radó)
- Function Theory and Topology (D. Pompeiu, Th. Angheluţă, N. Abramescu, P. Sergescu, G. Călugăreanu, T. Popoviciu)
- Mathematical Analysis and Optimization (T. Popoviciu, E. Popoviciu, I. Muntean, I. Maruşciac)
- Algebra and Number Theory (Th. Angheluţă, P. Sergescu, A. Angelescu, T. Popoviciu, Gh. Călugăreanu, Gh. Pic)
- Numerical Analysis and Approximation Theory (T. Popoviciu, D.V. Ionescu, Gh. Micula, E. Popoviciu, D.D. Stancu)
- Geometry (N. Abramescu, Tib. Mihăilescu, J. Gergely, Gh. Călugăreanu, M. Ţarină)
- Mechanics (C. Iacob, A. Angelescu, D.V. Ionescu, D. Pompeiu, P. Brădeanu)
- Astronomy and Astrophysics (Gh. Bratu, I. Armeanca, C-tin Pârvulescu, Gh. Chiş)
- Computer Science (T. Popoviciu, D.D. Stancu, E. Muntean)

- History and Philosophy of Mathematics (P. Sergescu, V. Marian, D.V. Ionescu, M. Ţarină, Gh. Micula)
- Didactics of Mathematics (D.V. Ionescu, T. Popoviciu, E. Popoviciu, I. Muntean, I. Maruşciac)

4. The scientific journals on Mathematics from Cluj

The scientific life of the mathematical section of the University of Cluj was roused by the publication of several scientific journals on Mathematics. Here are the most important ones.

1. Mathematica

The first volume of the journal Mathematica appears in 1929. "*MATHEMATICA est une nouvelle publication scientifique qui a pour bat d'établie des relations entre l'activité mathématique de la Roumanie et celle des autres pays*... it is written in the Preface of the first issue.

The Editorial board was composed by:

Directors: G. Ţiţeica and D. Pompeiu;

Editors: N. Abramescu (Cluj), A. Angelescu (Cluj), Th. Angheluţă (Cluj), G. Bratu (Cluj), A. Davidoglu (Bucureşti), D.V. Ionescu (Cluj), O. Onicescu (Bucureşti), C. Popovici (Iaşi), S. Sanielevici (Iaşi), S. Stoilow (Cernăuţi), V. Vâlcovici (Timişoara)

Secretary of the Board: Petre Sergescu (Cluj)

The first article published in this journbal belongs to Paul Montel, Professeur á la Faculté des Sciences de Paris.

2. Studia Universitatis Babeş-Bolyai, series Mathematica

The first volume of this journal appears in 1957 under the name *Bulletin of the Victor Babeş and Janos Bolyai Universities Cluj-Natural Sciences Series* and then, from 1958, under the name of *Studia Universitatis Babes-Bolyai, Series Mathematica*. Starting to 1996, the new *Studia Universitatis Babes-Bolyai, Series Informatica* is edited by the Department of Computer Science.

3. Revue d'Analyse Numérique et de Théorie de l'Approximation (ANTA)

The journal was founded, in 1972, by Tiberiu Popoviciu. The editors-in chief of the journal were successively Elena Popoviciu, Caius Iacob, Ion Păvăloiu and Dimitrie D. Stancu.

Today the journal is edited by the Tiberiu Popoviciu Institute on Numerical Analysis of the Romanian Academy, Cluj branch.

4. Didactica Mathematica

The first volume of this journal appears in 1985 and since 2013 it is an electronic journal. The editor-in-chief of the journal is Professor Dorel Duca.

5. Fixed Point Theory – An International Journal on Fixed Point Theory, Computation and Applications

This specialized journal appeared in 2000 under the coordination of Professor Ioan A. Rus and from 2007 it is the first mathematical journal from Cluj indexed Web of Science (ISI) by Thomson-Reuters Products.

5. The Romanian Professors of the University of Cluj

In the last part of this work, we will present (in alphabetical order) short biographical notes of the most important Romanian mathematicians of the University of Cluj.

Professor Nicolae Abramescu (1884-1947)

Nicolae Abramescu was born at Târgovişte on March 31, 1884.

University studies: Professor Nicolae Abramescu graduated the study program Mathematics from the Faculty of Science, University of Bucharest, where he was colleague with Traian Lalescu. In 1921 Nicolae Abramescu get his Ph.D. in Mathematics at the same university with a dissertation on the *Systematization of the orthogonal polynomials technique*.

Didactical activity: In November 1919 Professor Nicolae Abramescu was appointed as an Associate Professor at the University of Cluj, following the recommendation of Gheorghe Ţiţeica. Thus, Professor Nicolae Abramescu was a founder member of the Faculty of Science of our university. Here, together with Aurel Angelescu and Gheorghe Bratu constitute a strong and valuable kernel around Professor Dimitrie Pompeiu-Director of the Mathematical Seminar.

On October 1st 1926, Nicolae Abramescu is appointed full professor of Descriptive Geoemetry at the University of Cluj, position that he will keep until the end of his career.

Research activity: Nicolae Abramescu puts a lot of effort in organizing the Cluj Scientific Society, and the First Congress of Romanian Mathematicians. He was also a founder member of the journal *Mathematica* and member of the Romanian Academy.

Professor Abramescu passed away on February 11, 1947 at Cluj.

Professor Aurel Angelescu (1886-1938)

Aurel Angelescu was born at Ploieşti on April 15, 1886.

University studies: Professor Aurel Angelescu graduated his bachelor studies at Sorbonne, Paris. On April 7, 1916 he get (also at Sorbonne) the Ph.D. in Mathematics, under the guidance of Paul Appel. The title of his thesis was *Sur les polynômes généralisant les polynômes de Legendre et d'Hermite et sur le calcul approché des integrals multiples*.

Didactical activity: After his return to Romania, Aurel Angelescu is appointed, in 1919, professor at the Function Theory Chair of the University of Cluj. From now on, Professor Aurel Angelescu is fully dedicated to the intense work of organizing the mathematics education, being also one of the mentors of the new journal *Mathematica*.

Professor Aurel Angelescu was director of the Geometry and Mechanics Seminar and, for one year, between 1927 and 1928, he was appointed as Dean of the Faculty of Sciences at the University of Cluj. Starting to January 1st, 1930 Aurel Angelescu becomes full professor of Algebra and Number Theory at the University of Bucharest.

Research activity: Professor Aurel Angelescu main interest fields were generating functions for polynomials, linear differential equations, functional analysis, trigonometric series. He published more than 60 research works on the field of Algebra and Function Theory.

Very young, at the age of almost 52 de ani, Professor Aurel Angelescu tragically passed away on April 6, 1938.

Professor Theodor Angheluţă (1882-1964)

Professor Theodor Angheluţă was born on April 28, 1882 in the small village Adam from the (former) Tutova county.

University studies: After the primary and secondary studies at Bârlad, he becomes, between 1902-1905, a student of the Faculty of Sciences at the University of Bucharest getting the bachelor in Mathematics. From 1910, Professor Theodor Angheluţă is enrolled at Sorbonne, working mainly on the guidance of Emile Picard. On June 16, 1922 Professor Theodor Angheluţă defended his Ph.D. thesis *On a general class of trigonometric polynomials and the approximation of a continuous function.*

Didactical activity: In 1919, Professor Theodor Angheluţă is appointed associate professor at the Faculty of Sciences from the University of Bucharest, while five years later he get a full professor position on Algebra at the Faculty of Sciences from the University of Cluj.

Professor Theodor Angheluţă was the dean of the Faculty of Sciences from the University of Cluj between 1931 and 1932. He is retired starting to September 1st, 1947, but then, at the end of 1950, Professor Theodor Angheluţă is appointed again as full professor at the Faculty of Mathematics and Physics from Victor Babeş University of Cluj.

From October 1st, 1955 to September 1962 Professor Theodor Angheluţă was full professor at the Math Department of the Technical Institute of Cluj.

Research activity: Theodor Angheluţă has important contributions to the Function Theory, Differential and Integral Equations, Functional and Algebraic Equations. A special kind of functional equations carry even today his name: *Angheluţă type functional equations.*

On May 30, 1964 Professor Theodor Angheluţă passed away at Cluj.

Professor Ion Armeanca (1899-1954)

Ion Armeanca was born at Săcărâmb, Hunedoara county.

University studies: Professor Ion Armeanca took his secondary studies at Deva and then the university studies at the University of Cluj. His Ph.D. thesis (defended on July 26, 1933) entitled *Photographische und photovisuelle Helligkeiten von pohlnahen Sternen* was written under the guidance of Professor H. Kienle from the Astronomical Observatory in Göttingen. The thesis was published in one of the issue of the journal *Zeitschrift für Astrophysik*, a proof of its incontestable value.

Research activity: Starting to January 1st 1922, Ion Armeanca was secretary-librarian at the Astronomical Observatory. Then, from February 1928, he get a research position at the research center of the Astronomical Observatory in Cluj. Professor Ion Armeanca was an excellent specialist in photoelectronic photometry. Starting with 1939, Ion Armeanca made systematic observations at the Astronomical Observatory in Cluj, using the Guthnick photometer. From 1945, Ion Armeanca was the director of the Astronomical Observatory in Cluj and he made new research activities on the variable stars problem.

Professor Ion Armeanca was a member of the following societies: Gazeta Matematică, Astronomische Gesellschaft, Société Astronomique de France, National Committee for Astronomy.

Professor Gheorghe Bratu (1881-1941)

Gheorghe Bratu was born at Bucharest in 1881.

University studies: Gheorghe Bratu graduated the university studies at the University of Iaşi. His Ph.D. thesis *Sur l'equilibre des fils soumis á des forces intérieures*, written under the guidance of Professor Paul Appell from the Astronomical Observatory of Paris, was defended in 1914. Moreover, between 1909 and 1914, Professor Gheorghe Bratu get an Adamachi fellowship at the Astronomical Observatory of Paris.

Didactical activity: Gheorghe Bratu started his didactical activity in 1914, when he was appointed as assistent professor at the Astronomical Observatory of Iaşi. In 1918, Professor Gheorghe Bratu was appointed associate professor of Mathematical Analysis at the University of Iaşi and, then, from 1919 to the end of his life, Gheorghe Bratu was full professor of Astronomy at the Faculty of Sciences from the University of Cluj. Professor Gheorghe Bratu also wrote a very interesting course of Astronomy, published at Cluj.

Professor Gheorghe Bratu was the Dean of the Faculty of Sciences during the following academic years: 1923/1924, 1938/1939 and 1939/1940.

Research activity: Professor Gheorghe Bratu is the founder of the (modern times) Astronomical Observatory in Cluj. He was also the Director of the Observatory between 1920-1923 and 1928-1941.

Professor Gheorghe Bratu was a member of the following societies: Gazeta Matematică, Société Mathématiques de France, Societé Astronomique de France, Societa Astronomica Italiana, Circolo Matematica di Palermo, Romanian Scientific Academy, Astronomical National Committee. Professor Gheorghe Bratu also founded the Alliance Française, Cluj branch and he was decorate with Legion of Honour at rank of knight.

Professor Gheorghe Călugăreanu (1902-1976)

Gheorghe Călugăreanu was born at Iaşi, on July 16, 1902.

University studies: Gheorghe Călugăreanu started his studies at Bucharest at the Gheorghe Lazăr High School. Then, between 1921 and 1924, he was a student at the Faculty of Science from King Ferdinand University of Cluj, in the Mathematics-Physics study program.

In 1926, Gheorghe Călugăreanu leaves Cluj for Paris, with a fellowship of the Romanian goverment. He get the bachelor in Mathematics and, then, in 1928, the Ph.D. in Mathematics with a thesis entitled *Sur les fonctions polygènes d'une variable complexe*.

Didactical activity: The entire activity of Professor Gheorghe Călugăreanu is related to our university. Gheorghe Călugăreanu was assistent professor (1930-1934), associate professor (1934-1942) and then, from 1942, full professor at the University of Cluj. Later on, as a Dean of the Faculty of mathematics and Physics (1953-1957) or as a head of the Function Theory Chair, Professor Gheorghe Călugăreanu have had important contributions to the organization of the mathematics education in Cluj.

Research activity: The scientific activity of Professor Gheorghe Călugăreanu was focused on the study of the main problems of the theory of complex variable functions, geometry, algebra and topology. His first papers, including the Ph.D. thesis are valuable contributions to the theory of complex variable functions, in such a way that Gheorghe Călugăreanu can be seen as a prestigious follower of Dimitrie Pompeiu. Other remarkable results were obtained in domain of geometric theory of univalent functions. Professor Gheorghe Călugăreanu also has very important contributions in knots theory.

In 1963 Professor Gheorghe Călugăreanu becomes a member of the Romanian Academy. He passed away on November 15, 1976.

Professor Gheorghe Chiş (1913-1981)

Gheorghe Chiş was born in the village of Santău, Satu Mare county, on August 8, 1913.

University studies: Gheorghe Chiş attended the primary and secondary school in his village and then the high school in Carei, Satu Mare county. In 1935, Gheorghe Chiş get the bachelor in Mathematics-Physiscs at the University of Cluj. He get the Ph.D. also from the University of Cluj, in 1949.

Didactical activity: Gheorghe Chiş started his didactical career in 1936 at the Astronomical Observatory of the University of Cluj. Starting to 1960, Gheorghe Chiş is full professor of Astronomy and Astrophysics at the same University of Cluj. For six years, between 1962 and 1968, Professor Gheorghe Chiş was the dean of the Faculty of Mathematics-Mechanics from the University of Cluj. Moreover, from 1954 he was the Director of the Astronomical Observatory of the University of Cluj.

Research activity: Professor Gheorghe Chiş published more than 100 scientific papers and books. He was also the initiator of variable stars observations and of the permanent observation point of the artificial satellite with the code COASPAR 1132.

Professor Gheorghe Chiş was a member of the International Astronomical Union, of COSPAR and of the Romanian Astronomical Committee.

Professor Gheorghe Demetrescu (1885-1969)

Gheorghe Demetrescu was born in 1885 at Bucharest.

University studies: Gheorghe Demetrescu attended the courses of the University of Bucharest and get his Ph.D. also in Bucharest with a thesis *On a computation method to predict the Sun eclipses* on March 13, 1915.

Didactical activity: After a short stage at the Astronomical Observatory in Paris (1908-1912), Professor Gheorghe Demetrescu is appointed at the Astronomical Observatory in Bucharest. Starting to the academic year 1922/1923 and until 1927/1928 Professor Gheorghe Demetrescu get a new position at the Astronomical Observatory of the Faculty of Sciences in Cluj. Later on, Professor Gheorghe Demetrescu moved agaid to Bucharest, where he was the Director of the Astronomical Observatory.

Research activity: Professor Gheorghe Demetrescu published relevant scientific works on Astronomy and he was a member of the Romanian Academy.

Professor Sever Aurel Groze (1929-2011)

Professor Sever Aurel Groze was born in 1929 in a village of the Bistrią-Năsăud county.

University studies: Sever Aurel Groze attended, between 1948 and 1952, the courses of the Faculty of Mathematics and Physics from Victor Babeş University of Cluj and, then, he get his Ph.D. at the same university in 1971.

Didactical activity: At the end of his university studies, Sever Aurel Groze get an assistent professor position at the Faculty of Mathematics and Physics from Victor Babeş University of Cluj. From 1987 to 1996 Sever Aurel Groze was full professor at the Faculty of Mathematics and Computer Science from Babeş-Bolyai University Cluj-Napoca and, then, between 1996 and 2008 at the Faculty of Touristic and Commercial Management from Dimitrie Cantemir University Cluj-Napoca. Meanwhile, he was appointed Rector of the Baia-Mare Pedagogical Institute (between 1966 and 1968) and Dean of the Faculty of Mathematics, Physics and Chemistry of the Cluj Pedagogical Institute (between 1964-1966 and 1968-1972).

Research activity:

Professor Sever Aurel Groze published more than 50 scientific papers in several domains of Mathematics, such as Numerical Analysis, Arithmetics, Geometry and Computer Science.

Professor Sever Aurel Groze passed away on December 23, 2011 at Cluj-Napoca.

Professor Caius Iacob (1912-1992)

Caius Iacob was born at Arad on March 29, 1912. His father, Lazăr Iacob, was a member of the Romanian mission to the Great Assembly from Alba Iulia on December, 1st, 1918.

University studies: Caius Iacob attended the primary and secondary school in Arad and Oradea. Then, he attended the university studies at the University of Bucharest, the Faculty of Mathematics (1928-1931). Caius Iacob get his Ph.D. in 1935, at the Faculty of Sciences of the University of Paris with a thesis entitled *Sur la determination des fonctions harmoniques conjuguees par certaines conditions aux limites. Applications a l'hydrodynamique*, under the guidance of Professor Henri Villat.

Didactical activity: Professor Caius Iacob starts his didactical career in 1935 as assistant professor at Technical Institute of Timişoara. From March 15, 1938 Caius Iacob is appointed as assistent professor at the Mathematical Section of the Faculty of Sciences from the University of Cluj. In 1939, he moves to Bucharest where he

get a position at the Mechanics Laboratory of the University of Bucharest. In 1942, Caius Iacob returns to Cluj University as associate professor and, from December 30, 1943 (at the age of 31) Caius Iacob is appointed full professor of Mechanics. Later on, Professor Caius Iacob worked both in Cluj and in Bucharest University with a special emphasis on the courses of Fluid Mechanics and Aerodynamics.

Research activity: Professor Caius Iacob organized at Cluj University the research seminar on Fluid Mechanics. Caius Iacob was a laureate of the prize *Henri de Parville - for Mechanics* in 1940, awarded by the Science Academy in Paris. At the age of 43, on July 2, 1955, Professor Caius Iacob was elected correspondent member of the Romanian Academy, while on March 21, 1963 he becomes full member of the Romanian Academy. Professor Caius Iacob was the president of the Mathematics Section of the Romanian Academy and he was the founder of the Applied Mathematics Institute of the Romanian Academy which today carries his name. Professor Caius Iacob is the father of the Romanian School of Mechanics. He published more than 120 scientific works. His main book is *A Mathematical Introduction to Fluid Mechanics*.

Professor Caius Iacob passed away on February 6, 1992 at Bucharest.

Professor Dumitru V. Ionescu (1901-1985)

Dumitru V. Ionescu was born at Bucharest on May 14, 1901.

University studies: Dumitru V. Ionescu was, between 1919-1922, a student of the Mathematics study program at the Faculty of Sciences of the University of Bucharest, having as professors some very important Romanian mathematicians: Anton Davidoglu, David Emmanuel, Gh. Ţiţeica, Traian Lalescu, Dimitrie Pompeiu, ... Between 1923-1927 Dumitru V. Ionescu attended the courses of the famous École Normale Supérieure de Paris. Some of his professors were Emile Goursat, H. Lebesque, Paul Montel, Emile Picard. Between his colleagues: H. Cartan, J. Dieudonné, P. Dubreil and other great mathematicians of that time. The Ph.D. thesis, entitled *Sur une classe d'équations fonctionnelles* was defeated at Paris on June 7, 1927.

Didactical activity: Starting with the academic year 1927/1928, Dumitru V. Ionescu is appointed as associate professor at the University of Cluj and, then, from 1930 he is appointed professor at the Rational Mechanics Chair of the University of Cluj. After a short period at the Technical University of Cluj, from 1955 until 1971 (the year of his retirement), Dumitru V. Ionescu is full professor at the Differential Equations Chair.

Professor Dumitru V. Ionescu took many high scientical level courses, such as: Ordinary Differential Equations, Partial Differential Equations, Variational Calculus, Integral Equations, Numerical Analysis. Dumitru V. Ionescu published several courses, such as:

1. *Ecuaţii diferenţiale şi integrale*, Editura Didactică şi Pedagogică, Bucureşti 1965; 1972 .

2. (with C. Kalik) *Ecuaţii diferenţiale ordinare şi cu derivate parţiale*, Editura Didactică şi Pedagogică, Bucureşti, 1965.

3. (with Gh. Călugăreanu) *Curs de Analiză Matematică*, Universitatea din Cluj, 1956.

Dumitru V. Ionescu was the Dean of the Faculty of Sciences of the University of Cluj between 1941-1945) and head of the Chair of Differential Equations (between 1955-1971).

Research activity: The research topics of Professor Dumitru V. Ionescu were Differential Equations, Numerical Analysis, History of Mathematics, Didactical Mathematics. Professor Dumitru V. Ionescu published more than 200 scientific papers and the following monographs:

1. *Cuadraturi numerice*, Editura Tehnică, Bucureşti, 1957, (340 pp.)
2. *Diferenţe divizate*, Editura Academiei, Bucureşti, 1978, (303 pp.)

One of the most important achievement in his research activity was the so-called *the method of the function* ϕ.

Professor Dumitru V. Ionescu passed away on January 20, 1985 at Cluj-Napoca.

Professor George Iuga (1871-1958)

George Iuga was born on October 13, 1871 at Braşov.

Professor George Iuga was one of the first Romanian mathematicians who obtained the Ph.D. in Mathematics (1896) in France at Strasbourg.

He was a professor of the Faculty of Sciences of the University of Cluj between 1923 and 1938.

Professor Ioan Maruşciac (1925-1987)

Ioan Maruşciac was born at Crăciuneşti, Maramureş county on March 27, 1925.

University studies: After the primary school in his native village, Ioan Maruşciac attended the secondary school in the city of Sighetul Marmaţiei. Without a financial support from his family, he must work until 1947, as an ordinary worker at the Railways Company and then, at the Mayor House of Crăciuneşti. After his military stage, he is enrolled at the Ukrainean High School in Sighetul Marmaţiei and finally, in 1951 he finish the studies. Between 1951 and 1954, Ioan Maruşciac is a student of the Faculty of Mathematics and Physics of the Victor Babeş University in Cluj.

Didactical activity: Just after the faculty, Ioan Maruşciac get a didactical position in the university, at the Chair of Function Theory. From 1972, Ioan Maruşciac get a full professor position at the Babeş-Bolyai University Cluj-Napoca. During his activity in our university, Professor Ioan Maruşciac teached several courses, such as: Mathematical Analysis, Operational Research, Algorithm Theory, Mathematical Programming, Numerical Methods in Optimization.

Research activity: Professor Ioan Maruşciac has important contributions in Approximation Theory by Polynomials and Infrapolynomials, Optimization Theory. Professor Ioan Maruşciac published three monographs and more than 85 scientific papers. He was also Ph.D. supervisor in Operational Research.

Professor Ioan Maruşciac passed away in 1987.

Professor Gheorghe Micula (1943-2003)

Gheorghe Micula was born in the small village of Delureni, Bihor county on April 23, 1943.

University studies: After the high school attended at Vadu Crişului, Gheorghe Micula was a student (between 1960-1965) of the Mathematics specialization of the

Faculty of Mathematics and Physics from Babeş-Bolyai University Cluj. He also get a Humboldt fellowship in Germany (1974-1976) and a Fulbright fellowship in USA in 1971. Gheorghe Micula wrote his Ph.D. thesis under the guidance of Professor Dumitru V. Ionescu and defended it in 1971 at the Faculty of Mathematics-Mechanics from Babeş-Bolyai University Cluj.

Didactical activity: The entire didactical activity of Professor Gheorghe Micula took place at the University of Cluj. He was full professor at the Differential Equations Chair since 1992. Professor Gheorghe Micula teached several courses as: Differential Equations, Spline Functions, Finite Elements Methods, etc. He also wrote several books on Differential Equations and Spline Functions.

Research activity: The main research interests of Professor Gheoreghe Micula were focused on differential equations, numerical analysis and spline functions. He published more than 90 scientific papers and two monographs on spline functions. Gheorghe Micula was also invited professor at several important universities from Germany, USA, China, South Korea, New Zeeland, Israel, Italy, Czech Republik, Switzerland, etc.

Professor Gheorghe Micula passed away at Cluj-Napoca on December 24, 2003.

Professor Emil Muntean (1933-2009)

Emil Muntean was born at Măgura, Hunedoara county on July 31, 1933.

University studies: Emil Muntean graduated the Faculty of Mathematics from the University of Cluj in 1957. Then, he get the Ph.D. in Mathematics in 1964 at the University of Saint Petersburg, Soviet Union.

Didactical and research activity: Emil Muntean worked for the construction of the first Romanian computers: MARICA (1959), DACICC-1 (1961) and DACICC-200 (1969). DACICC-200 was the most efficient Romanian computer of the second generation, being capable to do more than 200,000 arithmetical operation/second. In 1968 Emil Muntean becomes the Director of the Institute for Computing in Cluj.

Since 1990, Emil Muntean get a full professor position at the Faculty of Mathematics from Babeş-Bolyai University. From 2000 Emil Muntean was full professor of Computer Science at the Faculty of Economics from Dimitrie Cantemir University of Cluj-Napoca. He was a fruitful Ph.D. supervisor in the field of Computer Science. He is also the founder of the publication series "MicroInformatica".

Emil Muntean passed away at Cluj-Napoca on November 29, 2009.

Professor Ioan Muntean (1931-1996)

Ioan Muntean was born at the village of Sântimbru, Alba county, on May 27, 1931.

University studies: After the primary school in the village of Sântimbru, Ioan Munteanu moved at the Petroşani High School, Hunedoara county. Then, Ioan Muntean started the university studies at the Faculty of Mathematics-Physics of the Babeş University. After two years of studies in Cluj (1950-1952), Ioan Muntean moved to the Faculty of Mathematics-Mechanics of the Lomonosov University. Here he graduated the studies in 1955. In 1976, Ioan Muntean get his Ph.D. in Mathematics with

a thesis entitled *Contributions to the qualitative study of the nonlinear oscilations*, under the scientific coordinations of academician Tiberiu Popoviciu.

Didactical activity: The didactical activity of Professor Ioan Muntean was entirely sustained at the Faculty of Mathematics from the University of Cluj, between 1976 and 1996. Professor Ioan Muntean teached several courses on Mathematical Analysis, Optimal Control, Functional Analysis, He was also very much involved in the Didactic of Mathematics having many presentations in the high schools in Transylvania and in the Mathematics Didactic Conference. Professor Ioan Muntean was Vice-Dean of the Faculty of Mathematics and Head of the Chair of Mathematical Analysis.

Research activity: The research activity of Professor Ioan Muntean was oriented to several topics as: Qualitative Theory of Differential Equations (he was initiated, during his stage in Moscow, by the Russian mathematicians Nemytski and Stepanov), Optimal Control, Approximation Theory, Functional Analysis, Real Analysis. Professor Ioan Muntean published more than 100 scientific papers. Since 1976, he was the leader of the Mathematical Analysis research group. Professor Ioan Muntean was a prolific supervisor in the field of Mathematics.

Professor Ioan Muntean passed away in August 1996 at Cluj-Napoca.

Professor Constantin Pârvulescu (1890-1945)

Constantin Pârvulescu was born at Ploieşti in 1890, on July 21.

University studies: After the university studies in Romania at Bucharest, Constantin Pârvulescu defended his Ph.D. entitled *Sur les amas globulaires d'étoiles et leurs relations dans l'espace* in 1925 at Sorbonne.

Didactical activity: Constantin Pârvulescu started his activity at the Astronomical Obesrvatory in Paris between 1921 and 1924. Then, he was professor of Astronomy and Rational Mechanics (1925-1940) at the Faculty od Sciences from the University of Cernăuţi. After a short period in Bucharest, Constantin Pârvulescu becomes, starting from 1941, full professor at the University of Cluj.

Research activity: Professor Constantin Pârvulescu was the Director of the Astronomical Observatory in Cluj (1941-1945) and founder of the Astronomical National Committee. Professor Constantin Pârvulescu was decorate with Legion of Honour at rank of knight and get, post-mortem, a honorary position in the Romanian Academy.

Professor Pârvulescu passed away on July 2, 1945.

Professor Dimitrie Pompeiu (1873-1954)

Dimitrie Pompeiu was born in the village of Broscăuţi, Dorohoi county on September 22, 1873.

University studies: After his primary and secondary schools in Dorohoi and Bucharest, Dimitrie Pompeiu went (1898) to Paris for the university studies. In 1905, Dimitrie Pompeiu get his Ph.D. with a thesis entitled *Sur la continuité des fonctions de variables complexes* under the guidance of Henri Poincaré. The motivation for such a study was an open problem concerning the singularities of uniform analytic functions, open problem posed by Painlevé in 1897.

Ludovic Zoritti wrote, also in 1905, a Ph.D. thesis in which he claimed to have proved that a uniform analytic function cannot be continuously extended on the set of its singularities. On the other hand, Pompeiu in his doctoral thesis proved the existence of certain analytic functions which could be extended continuously on their set of singularities even though this set had positive measure. Since both results could not be correct, the problem was "Where is the mistake ?" The mistery was resolved in 1909 when Denjoy confirmed that Pompeiu's results were correct, and he found the error in Zoritti's theorems. In 1907, in his paper *Sur les fonctions dérivées*, Dimitrie Pompeiu had clarified the whole situation by constructing simpler examples of functions, functions which are now called "Pompeiu functions". There was another important idea in Pompeiu's Ph.D. thesis, namely the distance between two sets, which he called the "écart" and "écart mutuel". Consequently, Dimitrie Pompeiu could be also considered as one of the founders of the theory of hyperspaces.

Didactical activity: In the autumn of 1905, Dimitrie Pompeiu comes back in Romania and get a position of associate professor on Mathematical Analysis and then of Mechanics at the University of Iaşi. In 1912, he moves to the University of Bucharest, as a successor of Spiru Haret. Starting to 1930, Dimitrie Pompeiu is appointed as a full professor of Function Theory, after the retirement of Professor David Emmanuel. Starting from the beginning of the academic year 1920, Dimitrie Pompeiu was appointed (for two academic years) full professor at the Faculty of Sciences of the new Romanian University of Cluj and the Head of the Mathematical Seminar. Actually, Professor Dimitrie Pompeiu have had an important role in the organization, not only of the Mathematical Seminar (following the model from College de France), but also of the mathematics education in the University of Cluj.

Research activity: Concerning the research activity of Professor Pompeiu, his main contributions were in the field of Complex Analysis. Academician Petru Mocanu described very well the contributions of Pompeiu to the field of Function Theory. "There is no doubt that Pompeiu's preferred area was Analysis, especially Complex Analysis, but he achieved remarkable results in other areas such as Mechanics. Pompeiu initiated the theory of polygenus functions as a natural extension of analytic functions. He introduced the notion of a special type of derivative, *the areolar derivative of a complex function*, extending the Cauchy formula which today is sometimes called the Cauchy-Pompeiu formula. In a short paper in 1929 entitled *Sur certains systemes d'équations linéires et sur une propriété intégrale des fonctions de plusieurs variables*, he proved that if the double integral of a continuous function takes the same value over any square of given side, then the function is constant. This simple remark has led to many interesting problems in Analysis and it is known today as the problem of Pompeiu." Let us also mention that more than 1000 papers cite this 1929 paper by Pompeiu. Among other topics on which Pompeiu published research articles we mention Interpolation Theory and Mechanics.

Dimitrie Pompeiu published around 150 research papers. In 1929, together with Petre Sergescu, Dimitrie Pompeiu founded the scientific journal *Mathematica (Cluj)*, one of the most influential journal of that period. In 1934 Dimitrie Pompeiu was elected member of the Romanian Academy.

Professor Dimitrie Pompeiu passed away on October 8, 1954 at Bucharest.

Professor Elena Popoviciu (1924-2009)

Elena Moldovan (married Popoviciu in 1974) was born on August 26, 1924 in Cluj-Napoca.

University studies: All her studies were attended in Cluj. Then, Elena Moldovan get her Ph.D. in Mathematics in 1965, with a thesis (supervised by academician Tiberiu Popoviciu) entitled *Set of interpolation functions and the concept of convex function.*

Didactical activity: The entire didactical activity of Professor Elena Popoviciu took place at the Faculty of Mathematics from Babeş-Bolyai University Cluj-Napoca. From 1969, Elena Popoviciu get a full professor position at the Mathematical Analysis Chair. She teached several courses such as: Mathematical Analysis, Abstract Algebra, Functional Analysis, Linear Programming, Distribution Theory, Approximation Theory, Operatorial Calculus.

Research activity: Elena Popoviciu started the research activity under the coordination of academician Grigore Călugăreanu, but then fascinated by the remarkable personality of Tiberiu Popoviciu, her research topic moved to convex function theory and interpolation function theory. Starting with 1974, Elena Popoviciu becomes Ph.D. supervisor and finally she have had 23 doctoral students. Elena Popoviciu founded, in 1960, the research *Seminar on Best Approximation and Mathematical Programming* and, in 1974, the *Interdisciplinary Research Lab.*

Elena Popoviciu was also very much involved in the editorial work of the following journals: *Revue Numérique et d'Analyse et de Théorie de l'Approximation* and *Annals of the Tiberiu Popoviciu Seminar of Functional Equations, Approximation and Convexity.*

Elena Popoviciu passed away on June 24, 2009 at Cluj-Napoca.

Professor Tiberiu Popoviciu (1906-1975)

Tiberiu Popoviciu was born on February 15, 1905 at Arad.

University studies: After the primary and secondary schools in Arad, Tiberiu Popoviciu attended (between 1924 and 1927) the courses of the Faculty of Sciences, the specialization Mathematics at the University of Bucharest.

His professors were some famous mathematicians of that time, such as: David Emmanuel, Gheorghe Ţiţeica, Dimitrie Pompeiu, Anton Davidoglu. In 1927, after a strong competition, Tiberiu Popoviciu is admitted at École Normale Superieure de Paris. Between 1927 and 1930, he attended simultaneous the mathematics courses from Sorbonne. During his stage at Paris, he attended the courses of great mathematicians such as: Emile Picard, Edouard Goursat, Jacques Hadamard, Elie Cartan, Paul Montel, Emile Vessiot, Gaston Julia, Jean Chazy. In 1928 Tiberiu Popoviciu get the bachelor in Mathematics and also starts the preparation of his Ph.D. thesis under the guidance of Paul Montel. On June 12, 1933 Tiberiu Popoviciu defended, with great success, the Ph.D. thesis *Sur quelques propriétes des fonctions d'une ou de deux variables réelles.*

Didactical activity: After his return to Romania, Tiberiu Popoviciu starts his university activities at Cluj, Cernăuţi and Iaşi. In 1948, Tiberiu Popoviciu comes

back to Cluj and is appointed professor, first at the Chair of Algebra and then at the Chair of Mathematical Analysis.

Research activity: Professor Tiberiu Popoviciu has important contributions in Mathematical Analysis, Approximation Theory, Convexity, Numerical Analysis, Functional Equations, Algebra and Number Theory, etc. One of his most important scientific contribution was the concept of convex functions of higher order (as a generalization of the notion of convex function) given in his Ph.D. thesis and then published in Mathematica, 8(1934), pp. 1-85. Most of the results concerning the theory of convex functions of higher order are contained in his famous book *Les fonctions convexes*, Actualitées Scientifique et Industrielles, Paris, 1944.

Professor Tiberiu Popoviciu is the founder of the Cluj School on Numerical Analysis. Because of his efforts, in 1957 it was created the Computing Institute of Cluj. In this institute, in 1961 is produced one of the first Romanian computers DACICC-1 (Dispozitiv Automat de Calcul al Institutului de Calcul din Cluj). Then, in 1969, also in Cluj, it is realized DACICC-200 - one of the most performant Romanian computer of the Sixties.

Tiberiu Popoviciu was, since 1948, corresponding member and from 1963 full member of the Romanian Academy. He was also for more than 30 years the president of the Cluj branch of the Romanian Mathematical Society.

Some other achievements of Tiberiu Popoviciu were: the reactivation, in 1958, of the journal *Mathematica (Cluj)*, the founding, in 1972, of the journal *Revue d'Analyse Numerique et de Theorie de l'Approximation*, the opening, in 1967, of a research seminar: *The Itinerant Seminar on Functional Equations*, later transfomed in *The Itinerant Seminar on Functional Equations, Approximation and Convexity.*

Professor Tiberiu Popoviciu was a very active, creative and prolific mathematician until his unexpected death in 1975, on October 29, after just half year from the moment of the abolition of his Institute of Computing by the communist regime.

Professor Petre Sergescu (1893-1954)

Petre Sergescu was born at Turnu-Severin in December 17, 1893.

University studies: After the primary and secondary schools attended at Turnu-Severin, between 1912 and 1916, Petre Sergescu is enrolled at the Mathematics section of the University of Bucharest.

He attended, in the same period, the courses of Faculty of Philosophy and the Music Academy from Bucharest. In 1919 Petre Sergescu leaves Romania for doing studies at Paris. In 1923 Petre Seregescu get his Ph.D. in Mathematics with a thesis *Sur les noyaux symétrisables* at the University of Bucharest.

Didactical activity: Professor Petre Sergescu starts his didactical activity in 1924, as assistent professor in Bucharest. In 1926, he is appointed associate professor and then, in 1938, full professor at the Analitical Geometry Chair and respectively the Mathematical Analysis Chair of the Faculty of Sciences from the University of Cluj. He also was Rector of the Technical University of Bucharest.

Because of the communist regime, he is forced to leave Romania and from 1948, Professor Petre Sergescu and his wife Marya Kasterska lived in Paris. Working in Paris, Petre Sergescu was for many years the secretary of the International Academy

of the History of Sciences and founder and general secretary of the International Union for the History of Sciences. Petre Sergescu was also Director of the journal *Archives Internationales d'Histoire des Sciences*.

Research activity: Professor Petre Sergescu was one of the founder of the journal *Mathematica (Cluj)* being also the secretary of the editorial staff until 1948. Professor Petre Sergescu was also the initiator of the first two Congresses of the Romanian Mathematicians (Cluj 1929 and Turnu-Severin 1932).

In 1940, when the North-West part of Transylvania was surrended to Hungary and the Faculty of Science moved to Timişoara, Professor Petre Sergescu was an active member of the Mathematical Seminar. Professor Sergescu published more than 160 scientific papers and took part to numerous international congresses and conferences. Professor Petre Sergescu was a corresponding member of the Romanian Academy.

Professor Petre Sergescu passed away at Paris on December 21, 1954.

Professor Dimitrie D. Stancu (1927-2014)

Dimitrei D. Stancu was born at the village of Călacea, Timiş county on February 11, 1927.

University studies: The life and the activity of the academician Dimitrie D. Stancu overlapped with the life of the Faculty of Mathematics from Babes-Bolyai University Cluj-Napoca, where he was admitted, in a pre-eminent way, in 1947.

Because of his remarkable results during the faculty, D.D. Stancu is appointed in 1951 assistant professor at the Mathematical Analysis Chair, conducted at that time by academician Tiberiu Popoviciu. In the same time, D.D. Stancu starts the work on his Ph.D. thesis and get the Ph.D. in Mathematics in 1956 with a thesis entitled *A study of the polynomial interpolation of several variables functions: applications to the derivative and the numerical integartion* under the guidance of Tiberiu Popoviciu. During the academic year 1961-1962 Dimitrie D. Stancu gets a fellowship from the Romanian Ministry of Education for a research stage in U.S.A. at the University of Wisconsin, research stage which will be very important for the future development of his career. After his return in Romania, he obtain in 1968, a full professor position at the Numerical and Statistical Calculus Chair from the Faculty of Mathematics.

Didactical activity: Professor Dimitrie D. Stancu teached high level courses on Mathematical Analysis, Numerical Analysis, Approximation Theory, Probability Theory, etc. Professor Dimitrie D. Stancu was Vice-Dean of the Faculty of Mathematics and, for many years, Head of the Numerical and Statistical Calculus Chair.

Research activity: Professor Dimitrie D. Stancu research activity was decisive influenced by his scientific cooperation with academician Tiberiu Popoviciu. His main research topics were: interpolation theory, derivative and numerical integration, orthogonal polynomials, spline functions, approximation of the functions by linear and positive operators, probabilistic and combinatoric methods in approximation theory. Professor Dimitrie D. Stancu dedicated part of his research work to Numerical Analysis in connection to Computer Science. Academician D.D. Stancu was the scientific coordinator of 41 Ph.D. students in the field of Numerical Analysis and Approximation Theory. Professor Dimitrie D. Stancu published more than 120 research papers with a strong nternational impact. More than 50 papers have the name of Dimitrie D.

Stancu in their title and the concept of *Stancu operator* is nowadays a very well-known notion in the mathematics literature.

Professor Dimitrie D. Stancu was elected in 1999 honorary member of the Romanian Academy. He also was an active collaborator of the Tiberiu Popoviciu Institute on Computing of the Romanian Academy and editor-in-chief of the journal *Revue d'Analyse Numérique et de Théorie de l'Approximation*.

Professor Dimitrie D. Stancu passed away at Cluj-Napoca on April 17, 2014.

Professor Marian Ţarină (1932-1992)

Marian Ţarină was born at Turda on August 15, 1932.

University studies: Marian Ţarină graduated the high school *Regele Ferdinand*, now *Mihai Viteazul National Colleage* in Turda. Then, he was addimited at the Faculty of Matehmatics and Physics from the University of Cluj, getting a *Magna Cum Laude* Diploma in 1954.

Under the guidance of academician Gheorghe Vrânceanu, he get the Ph.D. In Mathematics in 1964 with a thesis entitled *Partial Projective Spaces with Maximal Group of Motion* at the University of Bucharest.

Didactical activity: The entire didactical activity of Professor Marian Ţarină was at the University of Cluj. He obtained a full professor position at the Geometry Chair in 1990. Professor Marian Ţarină teached several courses such as: Differential Geometry, Foundaments of Algebraic Topology, Symmetric Spaces, Lie Groups, History of Mathematics, etc.

Research activity: Professor Marian Ţarină published more than 50 research papers and presented almost 200 scientific communications. His research topics were: Noneuclidean Geometry, Motion Groups in Riemann Spaces, Recurent Spaces, G-structures on Differentiable Manifolds, Finsler Spaces.

Professor Marian Ţarină unexpected passed away on May 31, 1992 at Oradea.

Professor Gheorghe Ţiţeica (1873-1939)

Gheorghe Ţiţeica was born at Drobeta Turnu-Severin on October 4, 1873.

University studies: After the secondary school attended in Craiova, Gheorghe Ţiţeica choose, for the university studies, the University of Bucharest. He get the bachelor in Mathematics in 1895.

Then, Gheorghe Ţiţeica leaves the country and get another bachelor (on the first position) in Mathematics at École Normale Supérieure de Paris. Gheorghe Ţiţeica also get the Ph.D. in Mathematics at Sorbonne (under the scientific coordination of Professor Gaston Darboux), being the fifth Romanian mathematician with doctoral studies at Sorbonne (after Spiru Haret, David Emanuel, Constantin Gogu and Nicolae Coculescu).

Didactical activity: In 1900, after his return to Romania, Gheorghe Ţiţeica was appointed as a professor of Geometry at the University of Bucharest. Starting with 1913 Gheorghe Ţiţeica becomes a member of the Romanian Academy. He was also the Dean of the Faculty of Sciences at the University of Bucharest and Doctor Honoric Causa of the Warsaw University.

Research activity: The scientific work of Professor Gheorghe Ţiţeica counts more than 400 scientific works, most of then in the area of differential geometry. Professor Gheorghe Ţiţeica discovered a new category of surfaces and a new category of curves which now carry his name. He also studied R-networks in the n-dimensional space, defined through some Laplace type equations. He is today recognized as the founder of the Romanian School of Differential Geometry.

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