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# Grigore Moisil

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**Grigore Constantin Moisil** (10 January 1906 in Tulcea, Romania - 21 May 1973 in Ottawa, Canada) was a Romanian mathematician, computer pioneer, and member of the Romanian Academy. His research was mainly in the fields of mathematical logic, (Łukasiewicz-Moisil algebra), Algebraic logic, MV-algebra, algebra and differential equations. He is viewed as the father of computer science in Romania.

Moisil was also a member of the Academy of Sciences in Bologna and of the International Institute of Philosophy. In 1996, the IEEE Computer Society awarded him posthumously the *Computer Pioneer Award*.

## Biography

Grigore Moisil was born in 1906 in Tulcea into an intellectual family. His grandfather, Grigore Moisil (1814-1891), a clergyman, was one of the founders of the first Romanian high school in Năsăud. His father, Constantin Moisil (1867-1958), was a history professor, archaeologist and numismatist; as a member of the Romanian Academy, he filled the position of Director of the Numismatics Office of the Academy. His mother, Elena (1863-1949), was a teacher in Tulcea, later the director of "Maidanul Dulapului" school in Bucharest (now "Enăchiță Văcărescu" school).

Grigore Moisil attended primary school in Bucharest, then high school in Vaslui and Bucharest (at "Spiru Haret" High School) between 1916-1922. In 1924 he was admitted at the Constructions Faculty of the Polytechnic University of Bucharest, and also the Mathematics Faculty of the University of Bucharest. He showed a stronger interest in mathematics, so he quit the Polytechnic University in 1929, despite already having passed all the third-year exams. In 1929 he defended his Ph.D. thesis, *La mécanique analytique des systèmes continus* (Analytical mechanics of continuous systems), before a commission led by Gheorghe Țițeica, with Dimitrie Pompeiu and Anton Davidoglu as members. The thesis was published the same year by the Gauthier-Villars publishing house in Paris, and received favourable comments from Vito Volterra, Tullio Levi-Civita, and Paul Lévy.

In 1930 Moisil went to the University of Paris for further study in mathematics, which he finalized the next year with the paper *On a class of systems of equations with partial derivatives from mathematical physics*. In 1931 he returned to Romania, where he was appointed in a teaching position at the Mathematics Faculty of the University of Iași. Shortly after, he left for a one-year Rockefeller Foundation scholarship to study in Rome.

In 1932 he returned to Iași, where he remained for almost 10 years, developing a close relationship with professor Alexandru Myller. He taught the first modern algebra course in Romania, named *Logic and theory of proof*, at the University of Iași. During that time, he started writing a series of papers based on the works of Jan Łukasiewicz in multi-valued logic. His research in mathematical logic laid the foundation for significant work done afterwards in Romania, as well as Argentina, Yugoslavia, Czechoslovakia, and Hungary. While in Iași, he completed research remarkable for the many new ideas and for his way of finding and using new connections between concepts from different areas of mathematics. He was promoted to Full Professor in November 1939.

In 1941, a position of professor at the University of Bucharest opened up, and Moisil applied for it. However, Gheorghe Vrânceanu, Dan Barbilian, and Miron Nicolescu also

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applied for the position, and Vrânceanu got it. Moisil approached the Ministry of Education, arguing that it would be a great opportunity for mathematics in Romania if all four could be appointed. As a result of his appeal, all four mathematicians were hired. Moisil moved to Bucharest, where he became a Professor in the Faculty of Mathematics (later the Faculty of Mathematics and Computer Science) at the University of Bucharest, on December 30, 1941. From 1946 to 1948, Moisil took a leave of absence, being named plenipotentiary envoy to Ankara. While in Turkey, he gave several series of mathematics lectures at Istanbul University and Istanbul Technical University.

In 1948, he resumed teaching at the University of Bucharest. That same year, he was elected to the Romanian Academy, and a member of the Institute of Mathematics of the Romanian Academy. After 1965, one of his outstanding students-- George Georgescu -- worked closely with him in multi-valued logics, and after the emergence of Romania from dictatorship in 1989, he became a professor of mathematics and logic at the same university and department. His student also published extensive, original work on algebraic logic, MV-algebra, Algebra, Algebraic topology, categories of MV-algebras, category theory and Łukasiewicz-Moisil algebra<sup>[1] [2] [3] [4] [5] [6]</sup> .

## Work

Moisil published papers on mechanics, mathematical analysis, geometry, algebra and mathematical logic. He developed a multi-dimensional extension of Pompeiu's areolar derivative, and studied monogenic functions of one hypercomplex variable with applications to mechanics. Moisil also introduced some many-valued algebras, which he called Łukasiewicz algebras (now also named Łukasiewicz-Moisil algebras), and used them in logic and the study of automata theory. He created new methods to analyze finite automata, and had many contributions to the field of automata theory in algebra.

Moisil had important contributions in the creation of the first Romanian computers. He played a fundamental role in the development of computer science in Romania, and in raising the first generations of Romanian computer scientists. In 1996, he was awarded posthumously the *Computer Pioneer Award* by the Institute of Electrical and Electronics Engineers Computer Society.

## See also

- Boolean logic
- Łukasiewicz

Łukasiewicz logic

- Ternary logic
- Lattices
- Multi-valued logic:

Łukasiewicz-Moisil algebras

- Quantum logic:

Quantum computers

- Algebraic logic:

MV-algebra

- Symbolic logic:

## Mathematical logic

- Algebra
- Category theory:

Categorical logic, Adjoint functors

- Institute of Electrical and Electronics Engineers

## Notes

- [1] <http://planetphysics.org/?op=getobj&from=books&id=253> Algebraic Mathematics and Logics. 2009., 400 pp, GNUL contributed book of 500+ contributing authors.
- [2] <http://planetphysics.org/encyclopedia/AlgebraicCategoryOfLMnLogicAlgebras.html> Algebraic category of  $LM_n$ -logic algebras
- [3] Georgescu, G. and C. Vraciu. 1970, On the characterization of centered Łukasiewicz algebras., *J. Algebra*, **16**: 486-495.
- [4] 2 Georgescu, G. 2006, N-valued Logics and Łukasiewicz-Moisil Algebras, *Axiomathes*, **16** (1-2): 123-136.
- [5] <http://planetmath.org/?op=getobj&from=lec&id=105> Order convergence and distance on Łukasiewicz-Moisil algebras
- [6] <http://planetmath.org/?op=getobj&from=objects&id=10756> Quantum LM-algebraic Logic

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- Solomon Marcus, "Grigore C. Moisil: A life becoming a myth" ([http://www.journal.univagora.ro/?page=article\\_details&id=27](http://www.journal.univagora.ro/?page=article_details&id=27)), International Journal of Computers, Communications & Control (<http://journal.univagora.ro/>), vol. 1 (2006), no. 1, 73–79.
- Viorica Moisil, "Once upon a time... Grigore Moisil" (*A fost odată... Grigore Moisil*), Bucharest: Curtea Veche, 2002. ISBN 973-8356-09-1
- Sergiu Rudeanu, Afrodita Iorgulescu, George Georgescu and Cătălin Ioniță, "G. C. Moisil memorial issue", *Multiple-Valued Logic* 6 (2001), no. 1-2. Gordon and Breach, Yverdon,

2001. MR 1817431 (<http://www.ams.org/mathscinet-getitem?mr=1817431>)

## External links

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  - Grigore Moisil (<http://genealogy.math.ndsu.nodak.edu/id.php?id=105937>) at the Mathematics Genealogy Project
  - Short bio (<http://www.ici.ro/romania/en/stiinta/moisil.html>), at the Romanian National Institute for R&D in Informatics
  - Grigore Moisil centenary (<http://fmi.unibuc.ro/cniv/2006/centenar-moisil/>), at the University of Bucharest
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