

Control and Cybernetics

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Stefan Rolewicz was born in 1932, March 15. His father was a mechanical engineer and his mother studied mathematics. During the World War II Stefan Rolewicz attended underground education and at this early stage showed exceptional mathematical abilities. He was one of the winners of the first Polish Mathematical Olympics in 1949/1950. In 1952 he married Danuta Przeworska. They have been collaborating successfully on many mathematical topics until today. Stefan Rolewicz completed mathematical studies at the University of Warsaw by writing a master thesis under the supervision of Stanisław Mazur. The thesis appeared as a paper “On inversion of non-linear transformations” (*Studia Math.* 17 (1958)). In 1958 he defended his doctoral thesis. His advisor was again S. Mazur. An essential part of the thesis was published under the title “On a certain class of linear metric spaces” (*Bull. Acad. Polon. Sci.* 5 (1957)). In 1962 he received the degree of Doctor Habilitated, based on the dissertation “On spaces of holomorphic functions”, published in *Studia Mathematica*, 21 (1962), and was appointed professor in 1970.

Between 1954 and 1958 Stefan Rolewicz held a position at the University of Warsaw. Since then he has been working at the Institute of Mathematics of the Polish Academy of Sciences, from 1970 on as a professor and for many years he headed the Division of Mathematical Analysis. He was a very active member of the Scientific Council of the Institute. In 1989 he organized the Publishing Department of the Institute and had been its head till 2006. He had longer scientific visits to Moscow University, University of Toronto, University of Karlsruhe, Monash University. He delivered invited lectures in Canada, USA, Germany, The Netherlands, Belgium, Soviet Union, Bulgaria, Hungary, Czechoslovakia, China, France, Greece, Yugoslavia, England, Sweden, Italy and Australia.

Professor Rolewicz was elected Member of the Warsaw Scientific Society and President of the Council of the Foundation for the Development of Polish Mathematics. He was a recipient, together with his wife Danuta Przeworska-Rolewicz, of the S. Banach award of the Polish Mathematical Society. He got several awards of the Polish Academy of Sciences. For many years he was a treasurer of the main office of the Polish Mathematical Society. In 1969-1977 and 1983-87 he was the President of the Warsaw Branch of the Society. He has also been serving for a long time on the Scientific Council of the Systems Research Institute of the Polish Academy of Sciences. He is a member of the Editorial Boards of the journals: *Applicationes Mathematicae*, *Commentationes Mathematicae*, *Control and Cybernetics*, *Zeitschrift für Analysis und ihre Anwendungen* (till January 2007), *Scientiae Mathematicae Japonicae*.

Professor Rolewicz’s main mathematical contributions are devoted to *functional analysis and optimization*. He is the author or co-author of more than

160 scientific papers and four mathematical monographs. He was an advisor to the following 14 PhD theses:

Kazimierz Malanowski (1965)	Phanh Quoc Khanh (Vietnam, 1978)
Kalindi Singbal-Vedak (India, 1968)	Sodowyn Batsuren (Mongolia, 1983)
Grażyna Pankiewicz (1972)	Ewa Bednarczuk (1986)
Szymon Dolecki (1973)	Alicja Sterna-Karwat (1987)
Quy Thi Kim Vu (Vietnam, 1974)	Stanisław Kryński (1989)
Jerzy Wilkowski (1974)	Szczepan Perz (1990)
Czesław Siemaszko (1974)	Song Wen (China, 1997).

Professor Rolewicz started his scientific work from the theory of metric linear spaces. Besides many papers on this subject, he wrote a book *Metric Linear Spaces*, published by PWN, Polish Scientific Publishers, in 1973. The book had a second edition in 1985 (Reidel and PWN) and is an authoritative source on the subject. Together with D. Przeworska-Rolewicz he developed an algebraic approach to the theory of linear operators. The results of their studies were summarized in the book *Equations in Linear Spaces*, published by PWN in 1968. He wrote, together with W. Żelazko, a series of important papers on linear topological algebras. One should mention in this context the paper *Entire functions in B_0 -algebras* (*Studia Math.* 21, 1962), co-authored with B. Mityagin and W. Żelazko. His paper *On orbits of elements* (*Studia Math.* 32, 1969), in which he constructed the first example of a hypercyclic operator in a Banach space, exerted a significant influence. The theory of hypercyclic operators is now developing very fast. In the paper *On drop property* (*Studia Math.* 85, 1986) he introduced and investigated an important functional-analytic concept, which attracted attention of many researchers.

The interest in optimization and control theory was stimulated by Professor Rolewicz's participation in famous Gelfand's seminar in Moscow. He pioneered in Poland the applications of functional analysis to those more applied disciplines of mathematics. Since 1964 he runs, together with Professor D. Przeworska-Rolewicz, a seminar at the Institute of Mathematics of the Academy, devoted to applications of mathematics to engineering problems. This research activity culminated in the monograph *Functional Analysis and Control Theory*, published by PWN, in Polish in 1974 (2nd edition 1977, German edition by Springer Verlag, 1976, revised and extended English edition by Reidel and PWN, 1987). He was an advisor of several PhD theses devoted to control of distributed parameter systems. With D. Pallaschke he wrote a monograph *Foundations of Mathematical Optimization*, published by Kluwer in 1997.

Recently, his research interests concentrate on optimization in metric spaces and, in particular, on what can be called *convex analysis without linearity*. The following most recent publications of Professor Rolewicz include: *Paraconvex analysis (Control and Cybernetics* 34, 2005), *On the Rockafellar theorem for monotone multifunctions* (*Studia Math.* 172, 2006), *Paraconvex analysis on $CE_{1,u}$ -manifolds* (*Optimization* 56, 2006).

Professor Rolewicz's approach to mathematics is enthusiastic, guided by the search for original problems and new concepts. He is an excellent lecturer, able to describe sophisticated results in a simple manner. I, personally, profited very much from numerous conversations with him on nonlinear analysis, control theory as well as on more general topics like history and philosophy of mathematics. Some of his suggestions were important for my own research.

Jerzy Zabczyk

List of publications of Stefan Rolewicz

1. On a certain class of linear metric spaces. *Bull. Acad. Polon. Sci.* **5** (1957), 471-473.
2. (with A. Pełczyński) Remarks on the existence of the Riemann-Stieltjes integral. *Coll. Math.* **5** (1957), 74-77.
3. (with C. Bessaga, A. Pełczyński) Some properties of the norms in F-spaces. *Studia Math.* **16** (1957), 183-192.
4. On inversion of nonlinear transformation. *Studia Math.* **17** (1958), 79-83.
5. O domkniętości rzutu podprzestrzeni w przestrzeniach Banacha (in Polish: On closedness of projection of subspaces in Banach spaces). *Prace Matem.* **3** (1959), 143-145.
6. Uwaga o wahaniu Kronroda funkcji dwóch zmiennych (in Polish: A remark on Kronrod's variation of a function of two variables). *Prace Matem.* **3** (1959), 49-54.
7. Some remarks on the spaces $N(L)$ and $N(l)$, *Studia Math.* **18** (1959), 1-9.
8. (with C. Bessaga, A. Pełczyński) Some properties of the spaces (s). *Coll. Math.* **7** (1959), 45-51.
9. O funkcjach o pochodnej zero (in Polish: On functions with zero derivative). *Wiadom. Matem.* **3** (1959), 127-128.
10. Remarks on linear metric Montel spaces. *Bull. Acad. Polon. Sci.* **7** (1959), 195-197.
11. On some generalization of Dvoretzky-Rogers theorem. *Coll. Math.* **8** (1960), 103-106.
12. On the characterization of Schwartz spaces by properties of the F-norm. *Studia Math.* **20** (1960), 89-94.
13. On isomorphism and approximative dimension of spaces of holomorphic functions (in Russian). *DAN SSSR* **133** (1960), 31-33.
14. On spaces of holomorphic functions. *Studia Math.* **21** (1962), 135-160.
15. (with C. Bessaga) On bounded sets in F-spaces. *Coll. Math.* **9** (1961), 89-91.
16. (with C. Bessaga, A. Pełczyński) On diametral approximative dimension and linear homogeneity of F-spaces. *Bull. Acad. Polon. Sci.* **9** (1961), 677-683.

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18. On Cauchy-Hadamard formula for Köthe power spaces. *Bull. Acad. Polon. Sci.* **10** (1962), 211-216.
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21. Entire functions in B_0 -algebras containing dense division algebras. *Studia Math.* **23** (1963), 187-193.
22. Some remarks on monothetic groups. *Coll. Math.* **13** (1964), 27-28.
23. (with D. Przeworska-Rolewicz) Remarks on Φ -operators in linear topological spaces. *Prace Matem.* **9** (1965), 91-94.
24. (with D. Przeworska-Rolewicz) On d and d_{Ξ} -characteristic of linear operators. *Annales Polon. Math.* **19** (1967), 117-121.
25. (with D. Przeworska-Rolewicz) On operators with finite d -characteristic. *Studia Math.* **24** (1964), 257-270.
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