

Giants of Science

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Zofia Szmydt

Szmydt, Zofia Jadwiga (July 29, 1923, Warsaw - November 26, 2010, *ibid.*), Mathematician. Daughter of Józef Konstanty, a farmer with higher education working on the Komary estate in the Vilnius region, and Zofia Gąsiorowska, later professor of Polish studies at the University of Warsaw.

Sz. in 1929–40 attended the primary school and the Gymnasium and Secondary School of Cecylia Plater-Zyberkówna in Warsaw. After the outbreak of World War II she continued her education in secret classes, and in 1940 she passed the mathematics-physics exam. During the war she was involved in tutoring.

She partially completed her higher education in secret classes in Warsaw (1940–44). After the family was expelled from Warsaw during the Warsaw Uprising, she moved to Krakow and in 1945/46 studied mathematics at Jagiellonian University, obtaining a master's degree in philosophy in the field of mathematics in March 1946. She prepared the paper entitled *On Characteristic Elements of a Matrix*. She got her PhD in philosophy in 1949 at Jagiellonian University on the basis of a dissertation entitled *About the First Integrals of a Differential Equation*; her mentor was Professor T. Ważewski. In it she presented a solution to the problem of the existence of non-trivial first integrals of the equation given by the promoter $y' = f(x, y)$ in coherent areas. The paper was only fourteen pages long and was published in *Ann. Soc. Polon. Math.*, vol. 23(1950). In his opinion, T. Ważewski noted, 'The paper is written flawlessly and, considering a complex problem, very clearly.' She retained this style of writing in the future. She passed the exam in front of the commission composed of F. Leja, T. Ważewski, and S. Gołąb. She chose logic as an auxiliary subject, which was not often the case with doctorates in mathematics. She was a demanding and meticulous person in research.

In 1954 she was appointed an associate professor. In 1958 she was awarded her PhD at the Institute of Mathematics of the Polish Academy of Sciences. She presented the dissertation entitled *New Type Limit Problems for Hyperbolic Partial Differential Equations*, consisting of 6 papers (list in [Łysik 2015] papers [9] - [14]). In the academic year 1958/59 she received a scholarship from the Polish Academy of Sciences to stay in Italy, then two Italian scholarships, each for six months (Istituto Nazionale di Alta Matematica). Her lectures at the seminar were very well received by Italian mathematicians. In 1961 she was awarded the title of associate professor.

The main topics of her research were, as she pointed out in her summary of professional accomplishments (1984), related to the procedure of awarding the title of full professor: qualitative theory of ordinary differential equations, hyperbolic systems with two independent variables, potential theory, distribution boundary problems, distribution theory, distribution and solutions invariant. She formulated and researched a new type of limit problem for partial systems of hyperbolic equations (now called the Zofia Szmydt problem) To work on the monograph *Fourier Transform and Linear Differential Equations* (PWN, Warsaw 1972, English edition: *Fourier Transformations and Linear Differential Equations*, Warsaw - Dordrecht 1977) she actively involved young staff through the implementation of master's and doctoral theses. 'The purpose of writing the monograph - as Grzegorz Łysik notes - was to present the basics of the theory of linear partial differential equations with particular emphasis on distribution limit problems for the basic equations of mathematical physics (heat, Schrödinger, wave, Laplace and Poisson equations). This monograph contains the first extensive study of the foundations of the theory of Fourier distribution and transformation in terms of distribution in Polish literature. In the study of boundary problems, the operation of distributive determination of variables introduced by Łojasiewicz is used.' In the monograph, she not only included her own research centre, but also presented a precise overview of tools and methods. It is a unique lecture on the fundamental theory of linear differential equations in

mathematical physics. A measure of the achievements of Sz. is the fact that their results are used and developed by mathematicians in Poland and in the world. G. Łysik — a PhD student and continuator of her achievements — lists the following mathematicians: Cz. Olech, A. Lasota, A. Bielecki, J. Kisyński, A. Pelczar, F. Guglielmino, R. P. Holten, R. Conti, S. Yoshida, J. Bejda, H. J. Bremermann, P. Reizin, W. C. Rogozin, J. Cronin, W.A. Coppel, W. Walter, L. Cesari, N. Onuchie, P. Z. Tábaos, A. Pliś, R. Wawak, J. Pomykała, P. Dierolf, P. Wagner, B. Ziemian, S. Michalik. From 1981 to 1984 she was the head of doctoral studies at the faculty of mathematics, computer science and mechanics at the University of Warsaw.

She is the author or co-author of almost 60 scientific publications in the field of the theory of differential equations, potential theory, and distribution theory.

She was a reviewer of professors' theses, including those of Z. Opial, Z. Mikołajska-Mlakowa, Cz. Olech, A. Turowicz, M. Kuczma, W. Mlak, S. Łojasiewicz, and Cz. Kluczny.

She started her professional career in 1946 at Jagiellonian University (assistant, assistant professor) where she worked until 1952. From 1949 to 1971 she was employed at the Krakow branch of the Mathematical Institute of the Polish Academy of Sciences (during this period, she worked for a year at the Warsaw University of Technology and lectured at Jagiellonian University and the University of Warsaw). From 1971 until her retirement in 1993 she worked at the University of Warsaw. In the period 1991–93 she was delegated to the Mathematical Institute of the Polish Academy of Sciences to work together with B. Ziemian (1953–1997) on the monograph entitled *Mellin Transformation and Fuchsian Type Partial Differential Equations* (Kluwer, Dordrecht, 1992).

After retiring, she continued to work part-time at the Mathematical Institute of the Polish Academy of Sciences, preparing, together with Ziemian, a monograph on Laplace distributions. The book was not finished, but portions of it have been presented in the work *Topological Imbedding of Laplace Distributions in Laplace Hyperfunctions*, Diss. Math.

(The dissertations of Mat. 1998).

She received the award of the Polish Mathematics Association of S. Banach (1956) and the individual 1st degree award of the Minister of Science, Higher Education and Technology (1973). She was decorated with the Knight's Cross of the Order of Polonia Restituta (1973). She mentored three doctors: Bogdan Ziemian (1981), Ryszard Wawak (1985), Grzegorz Łysik (1989).

G. Łysik: *Zofia Szmydt* (1923–2010), 'Wiadomości Matematyczne', 2015, pp. 283–297; Archives of the University of Warsaw: personal data, reference number 5,520,313; Archives of Jagiellonian University: student data and doctorates, ref. KM 56, WMP 171.

Stanisław Domoradzki

[Previous Page](#)