

Wacław Sierpiński

Wacław Franciszek Sierpiński (Polish: [ˈvatswaf frap ɕɨɕɛk ɕerˈpiɲski] (listen)) (14 March 1882 – 21 October 1969) was a Polish mathematician. He was known for contributions to set theory (research on the axiom of choice and the continuum hypothesis), number theory, theory of functions and topology. He published over 700 papers and 50 books.

Three well-known fractals are named after him (the Sierpinski triangle, the Sierpinski carpet and the Sierpinski curve), as are Sierpinski numbers and the associated Sierpiński problem.

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Educational background

Sierpiński enrolled in the Department of Mathematics and Physics at the University of Warsaw in 1899 and graduated four years later. In 1903, while still at the University of Warsaw, the Department of Mathematics and Physics offered a prize for the best essay from a student on Voronoy's contribution to number theory. Sierpiński was awarded a gold medal for his essay, thus laying the foundation for his first major mathematical contribution. Unwilling for his work to be published in Russian, he withheld it until 1907, when it was published in Samuel Dickstein's mathematical magazine 'Prace Matematyczno-Fizyczne' (Polish: 'The Works of Mathematics and Physics').

After his graduation in 1904, Sierpiński worked as a school teacher of mathematics and physics in Warsaw. However, when the school closed because of a strike, Sierpiński decided to go to Kraków to pursue a doctorate. At the Jagiellonian

Wacław Sierpiński	
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Born	<div>Wacław Franciszek Sierpiński</div> 14 March 1882 <div>Warsaw, Congress Poland, Russian Empire</div>
Died	<div>21 October 1969 (aged 87)</div> Warsaw, Polish People's Republic
Nationality	Polish
Alma mater	University of Warsaw
Known for	Sierpinski triangle <div>Sierpinski carpet</div> Sierpinski curve <div>Sierpinski number</div>
Scientific career	
Fields	Mathematics
Doctoral advisor	Stanisław Zaremba <div>Georgy Voronoy</div>
Doctoral students	Jerzy Browkin <div>Edward Marczewski</div> <div>Stefan Mazurkiewicz</div>

University in Kraków he attended lectures by Stanisław Zaremba on mathematics. He also studied astronomy and philosophy. He received his doctorate and was appointed to the University of Lwów in 1908.

Jerzy Neyman
Stanisław Ruziewicz
Andrzej Schinzel

Life of Sierpiński

In 1907 Sierpiński first became interested in set theory when he came across a theorem which stated that points in the plane could be specified with a single coordinate. He wrote to Tadeusz Banachiewicz (then at Göttingen), asking how such a result was possible. He received the one-word reply 'Cantor'. Sierpiński began to study set theory and, in 1909, he gave the first ever lecture course devoted entirely to the subject.

Sierpiński maintained an output of research papers and books. During the years 1908 to 1914, when he taught at the University of Lwów, he published three books in addition to many research papers. These books were *The Theory of Irrational Numbers* (1910), *Outline of Set Theory* (1912), and *The Theory of Numbers* (1912).

Sierpinski square, a fractal

When World War I began in 1914, Sierpiński and his family were in Russia. To avoid the persecution that was common for Polish foreigners, Sierpiński spent the rest of the war years in Moscow working with Nikolai Luzin. Together they began the study of analytic sets. In 1916, Sierpiński gave the first example of an absolutely normal number.

When World War I ended in 1918, Sierpiński returned to Lwów. However shortly after taking up his appointment again in Lwów he was offered a post at the University of Warsaw, which he accepted. In 1919 he was promoted to a professor. He spent the rest of his life in Warsaw.

During the Polish–Soviet War (1919–1921), Sierpiński helped break Soviet Russian ciphers for the Polish General Staff's cryptological agency.

In 1920, Sierpiński, together with Zygmunt Janiszewski and his former student Stefan Mazurkiewicz, founded the mathematical journal Fundamenta Mathematicae. Sierpiński edited the journal, which specialized in papers on set theory.

Grave of Wacław Sierpiński

During this period, Sierpiński worked predominantly on set theory, but also on point set topology and functions of a real variable. In set theory he made contributions on the axiom of choice and on the continuum hypothesis. He proved that Zermelo–Fraenkel set theory together with the Generalized continuum hypothesis imply the Axiom of choice. He also worked on what is now known as the Sierpinski curve. Sierpiński continued to collaborate with Luzin on investigations of analytic and projective sets. His work on functions of a real variable includes results on functional series, differentiability of functions and Baire's classification.

Sierpiński retired in 1960 as professor at the University of Warsaw, but continued until 1967 to give a seminar on the Theory of Numbers at the Polish Academy of Sciences. He also continued editorial work as editor-in-chief of *Acta Arithmetica*, and as an editorial-board member of *Rendiconti del Circolo Matematico di Palermo*, *Composito Matematica*, and *Zentralblatt für Mathematik*.

In 1964 he was one of the signatories of the so-called Letter of 34 to Prime Minister Józef Cyrankiewicz regarding freedom of culture.

Sierpiński is interred at the Powązki Cemetery in Warsaw, Poland.

Honors received

Honorary Degrees: Lwów (1929), St. Marks of Lima (1930), Amsterdam (1931), Tarta (1931), Sofia (1939), Prague (1947), Wrocław (1947), Lucknow (1949), and Moscow (1967).

For high involvement with the development of mathematics in Poland, Sierpiński was honored with election to the Polish Academy of Learning in 1921 and that same year was made dean of the faculty at the University of Warsaw. In 1928, he became vice-chairman of the Warsaw Scientific Society, and that same year was elected chairman of the Polish Mathematical Society.

He was elected to the Geographic Society of Lima (1931), the Royal Scientific Society of Liège (1934), the Bulgarian Academy of Sciences (1936), the National Academy of Lima (1939), the Royal Society of Sciences of Naples (1939), the Accademia dei Lincei of Rome (1947), the Germany Academy of Sciences (1950), the American Academy of Arts and Sciences (1959), the Paris Academy (1960), the Royal Dutch Academy (1961),^[1] the Academy of Science of Brussels (1961), the London Mathematical Society (1964), the Romanian Academy (1965) and the Papal Academy of Sciences (1967).

In 1949 Sierpiński was awarded Poland's Scientific Prize, first degree.

Publications

Sierpiński authored 724 papers and 50 books. Two of these, *Introduction to General Topology* (1934) and *General Topology* (1952) have been translated into English by Canadian mathematician Cecilia Krieger. Another book, *Pythagorean Triangles* (1954), was translated into English by Indian mathematician Ambikeshwar Sharma, published in 1962, and republished by Dover Books in 2003; it also has a Russian translation.^[2]

- W. Sierpiński (1964). *Elementary theory of numbers* (<http://pldml.icm.edu.pl/pldml/details/contents.action?id=bwmeta1.element.dl-catalog-556369c7-b6cc-4a5b-be36-bfc8e0ca7cfa>). Monografie Matematyczne. 42. ISBN 0-444-86662-0.

See also

- Arity theorem
- List of Poles
- Menger sponge
- Seventeen or Bust

- [Sierpiński carpet](#)
- [Sierpiński's constant](#)
- [Sierpiński curve](#)
- [Sierpiński game](#)
- [Sierpiński number](#)
- [Sierpiński set](#)
- [Sierpiński space](#)
- [Sierpiński triangle](#)
- [The Sierpiński moon crater](#)

References

1. "W. Sierpinski (1882 - 1969)" (<http://www.dwc.knaw.nl/biografie/pmknaw/?pagetype=authorDetail&ald=PE00002984>). Royal Netherlands Academy of Arts and Sciences. Retrieved 17 July 2015.
2. Hopkins, Brian (January 2019), "review of *Pythagorean Triangles*", *The College Mathematics Journal*, **50** (1): 68–72, doi:[10.1080/07468342.2019.1547955](https://doi.org/10.1080/07468342.2019.1547955) (<https://doi.org/10.1080%2F07468342.2019.1547955>)

External links

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- Wacław Sierpiński (<https://www.genealogy.math.ndsu.nodak.edu/id.php?id=12545>) at the Mathematics Genealogy Project
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- Several of Sierpiński's books (<http://matwbn.icm.edu.pl/ksspis.php?wyd=10>), Biblioteka Wirtualna Nauki.
- Sierpiński: Fractals, Code Breaking, and a Crater on the Moon (<http://culture.pl/en/article/sierpinski-fractals-code-breaking-and-a-crater-on-the-moon>)

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