Virtual Special Issue – Dedicated to the 120th anniversary of the eminent Russian mathematician P.S. Alexandroff
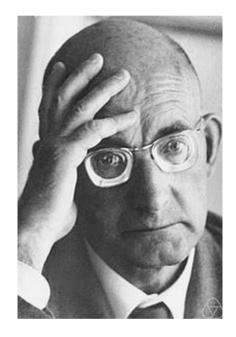
Pavel Sergeevich Aleksandrov ☆
(May 7, 1896–November 16, 1982)

Corresponding Member of the Academy of Sciences of the USSR (1929) and Member of the Academy of Sciences of the USSR (1953); Member of the Göttingen Academy of Sciences (1945), the National Academy of Sciences of the United States (1947), the Leopoldina Academy in Halle (1959), the Austrian Academy of Sciences (1968), the Polish Academy of Sciences, and the Academy of Sciences of the DDR.

Member of the American Philosophical Society in Philadelphia (1947), Honorary Doctor of the Humboldt University of Berlin, Honorary Member of the London Mathematical Society, Honorary member of the Royal Dutch Mathematical Society.

Hero of Socialist Labor (1969), recipient of the Stalin Prize of 1st degree (1943), winner of Lobachevsky Prize (1972).

Professor at Lomonosov Moscow State University (since 1929).
Head of the Department of Higher Geometry (1933–1935), the Department of Higher Geometry and Topology (1943–1982), the Division of Mathematics of Mechanics and Mathematics Faculty of Moscow State University (1954–1978), the Department of Topology of Steklov Mathematical Institute of the Russian Academy of Sciences (1959–1982).

Vice President of the International Congress of Mathematicians (1958–1962).
President of the Moscow Mathematical Society (1932–1964), Honorary President of the Moscow Mathematical Society (since 1964).
Editor-in-chief of *Uspekhi Matematicheskikh Nauk* (1936–1982).

One of the organizers of the First Moscow Mathematical Olympiad for high-school students in 1935.

☆ Sometimes romanized as Alexandroff or Alexandrov.

Pavel Sergeevich Aleksandrov's biography is narrated in his memoirs [1] entitled "Pages from an autobiography," which were published in two issues of the journal *Uspekhi Matematicheskikh Nauk*: vol. 34 (1979), no. 6 (210), pp. 219–249 (part one) and vol. 35 (1980), no. 3 (213), pp. 241–278 (part two). Some data can also be gleaned from papers [2–4], and [5]. Here we confine ourselves to quoting from these papers.

[3]: "Pavel Sergeevich Aleksandrov was born in Noginsk (formerly Bogorodsk) into the family of the reputable district doctor Sergei Aleksandrovich Aleksandrov."

"Pavel Sergeevich was educated at Moscow University, which he entered in 1913. His choice of profession was greatly influenced by his school teacher in mathematics Aleksandr Romanovich Eiges, who correctly evaluated the abilities of his best pupil."

"The teachers, or, as is now said, scientific advisors of the student Aleksandrov were Professors Dmitrii Fedorovich Egorov and Nikolai Nikolaevich Luzin. The first scientific results of Pavel Sergeevich were the theorem on the cardinality of Borel sets and the construction of the widely known A-operation, which was named so by another Luzin's remarkable student, Mikhail Yakovlevich Suslin, in honor of Aleksandrov. It is no exaggeration to say that these and other results of Aleksandrov are the cornerstones of the theory of Borel and analytic sets."

"As if in reply to these advances, Luzin gave Pavel Sergeevich the extremely challenging continuum problem, which, as is now understood, could not be solved by means existing at that time. The failure was a great shock for Pavel Sergeevich, and he, unfortunately, gave up mathematics for several years."

[4] "He went first to Novgorod-Severskii, where he worked as director in a drama theater, and then to Chernikov, where he was president of a theatrical committee, which came under the Government Board of Instruction. In Chernikov he gave lectures on Russian and foreign literature, courses of lectures on Dostoevskii, Gogol and Goethe, which were very successful."
   "In 1921 Aleksandrov became a lecturer at the University of Moscow."

[3] "Pavel Sergeevich had been greatly influenced by his intimate friendship with Pavel Samulovich Uryson. Together they set out to study abstract, or general, topology, which had not yet been known in Russia. They developed the theory of compact (countably compact) spaces; by himself Pavel Sergeevich created the theory of bicompact (compact in modern terminology) spaces."

"The theory of bicompact spaces, together with its further development by Pavel Sergeevich's student Andrei Nikolaevich Tikhonov, is an indispensable contribution of Pavel Sergeevich to contemporary mathematics. His study (both joint with Uryson and independent) of the metrization problem for topological spaces is beyond all doubt one of the seeds from which uniform topology has grown. We also mention Pavel Sergeevich's results related to bicompact extensions of topological spaces. Moreover, the notion of a locally finite cover, which is so extensively used in general topology, was first defined by Aleksandrov."

[4] "The theory of compacta, which was created by Aleksandrov (in collaboration with Uryson in the preliminary stages), became the foundation for the greater part of subsequent set-theoretical research, and its ideas penetrated into the theory of topological groups, into functional analysis, mathematical logic, and many other branches of mathematics."

"So we see that the concept of a locally finite covering, introduced by Aleksandrov as early as 1924, is the basis of modern metrizability criteria and of the theory of paracompact spaces."

[2] "The summer of 1923 was the beginning of Aleksandrov's travels abroad. During these trips, Pavel Sergeevich met prominent mathematicians, such as Hilbert, Klein, Brouwer, Hausdorff, Noether, and Hopf; he was keeping up scientific contacts with some of them for many years."