

## Biography of Alexei Petrov (1910–1972)



*A. Petrov in the 1960's*

Alexei Zinovievich Petrov was born on October 28, 1910, in the village of Koshki in Samara Gubernya in the Russian Empire. The eleventh of twelve children, Alexei was ill as a child. His father, Zinovey, was the parish priest of the Russian Orthodox Church and died of tuberculosis when Alexei was only five years old. As a widow, his mother Zoe was without financial resources. She therefore elected to send her two youngest sons, Alexei and Sevir, to live with their aunt, Catherine Petrova, a village school teacher. Catherine adopted both boys, giving them her family name.

In 1926, Alexei was graduated from a normal school at Melekh, a small provincial town. Being a sickly child, he preferred reading to playing games with other boys. He was interested in mathematics, and read many books in this field beyond the scholarly curriculum. In 1932, he entered the Department of Physics and Mathematics of Kazan University, where he became a pupil of Prof. Peter Schirokov. The latter was a prominent investigator in the field of non-Euclidean geometry. Schi-

rov was highly enthusiastic concerning Einstein's theory of relativity. He supported any achievement in this direction. Amongst Schirokov's students, Alexei built a fine reputation as a powerful and independent scientist, despite his youth. Following many long conversations with Schirokov, Alexei Petrov selected the topic for his PhD Thesis. The resulting manuscript became the basis for famous book *Einstein Spaces*.

In the beginning of World War II, Alexei Petrov volunteered for military service and became a commander of mortar artillery. In December 1941, he was sent into battle and in August 1943, he was severely wounded. After a prolonged confinement in the hospital, he remained disabled and retired from military service. His health would never return.

Alexei Petrov then took up residence in Kazan, surviving with his wife and son. He continued to study Einstein spaces and was led to the idea of classifying such spaces according to the algebraic structure of the curvature tensor. Today, this is known as the Petrov classification. Petrov published his key papers on this classification in two forms, first as a short communication in the Proceedings of the Academy of Sciences of USSR (1951), and second, as an expanded treatment in the local bulletin of Kazan University (1954).

During the late 1940's through the 1950's, Alexei Petrov was employed as a lecturer. He quickly became a very popular lecturer and a favourite among the student community. He taught at many places within Kazan, including Kazan University where he was elected a professor in 1956.

In 1960, Petrov organized the Faculty of Relativity Theory and Gravitation at Kazan University, and led the Faculty during the next ten years. That year, the first Russian edition of his monograph *Einstein Spaces* was issued. With this publication, Petrov became a well known and admired by theoretical physicists throughout the world. An English translation of his famous book was eventually published in 1969, by Pergamon Press.

Aside from his classification system, Petrov was also interested in the other fields related to Einstein's theory of relativity. He tried to apply the methods of group theory to these problems. Petrov was also interested in gravitational waves. This is because Einstein spaces of the second and the third kind, in the framework of his classification, are related to the fields of gravitational radiation. Eventually, Petrov authored a popular book entitled *Space, Time, and Matter*, which was the result of his lectures explaining the essence of Einstein's theory of relativity to the general public.

There was a long-term conflict between Petrov and the administration of Kazan University: the Soviet bureaucracy non-allowed independent thinking and behaviour that was very specific to Petrov's individuality. In 1969, this conflict has reached the apogee. As happily Petrov had good friends amongst the fluent scientists at Kiev, the capital city of Ukraine. The friends elected him in 1969 a full member of the Academy of Sciences of the Ukraine at Kiev, and invited to join the academic staff of the Institute of Theoretical Physics. He resolved to leave Kazan immediately and settle in Kiev, but unfortunately these would be the last two years of his life.

Alexei Petrov was consumed by his scientific ideas. The walls of his office were adorned with the portraits of Einstein and Schirokov. Petrov worked for many years without relaxation. It can be said that this train of Petrov's life, in conjunction with his old wounds and generally poor health, slowly killed him. He suffered several heart attacks. However, during each hospitalization, despite intense medical treatment, he would ask his family and friends for a pen and paper. Tragically, he died from the complications of a blood clot on May 09, 1972, at a hospital in Kiev. He was only 61.

*Dmitri Rabounski*

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