Biography of Aleksandr Lyapunov

Name and Name Modifications:
Alexander Michailowitsch Ljapunow
Aleksandr Michajlovic Ljapunov
Ljapunoff
Liapunov

Dates of Birth and Death:
(∗) 6 June 1857 in Yaroslavl, Russia
(†) 3 November 1918 in Odessa, Russia, today Ukraine

Family Data:
Aleksandr’s father was the well-known astronomer Mikhail Vasilyevich Ljapunov, head of the Demidovski lyceum. The mother was Sofia Aleksandrovna Shilipova. Aleksandr had two brothers, Sergei, who became composer, and Boris, expert for Slavistics. Because of problems with the university the family retired from academic life and moved to the mother’s estate in Simbirsk province in 1864. Two years after her husband’s death the mother moved to Nizhny-Novgorod.

At 29 years of his age, Ljapunov married his cousin Nataliya.

In 1917, Ljapunov together with his seriously ill wife moved to Odessa; he also became partly blind. The day his wife died of tuberculosis he shot himself, but still lived for some days.

Education:
The father taught his two oldest sons Aleksandr and Sergei (1859-1924) at home with the help of books in the subjects mathematics, astronomy, philosophy, history, ethnography, political economy and literature. After the death of the father, the uncle R.M. Sechenov educated him together with his daughter Nataliya Rafailnova.

From 1870 to 1876 Ljapunov together with his friend Andrei Markov (1856-1922) attended the gymnasium in Nizhny-Novgorod.

Ljapunov and Markov then studied at the University of St. Petersburg physico-mathematics under Pafnuty Cebyshev (1821-1894), and chemistry. In 1880, Ljapunov finished his studies to start with research. In 1884, he
was awarded with the M.A. in applied mathematics with his thesis “About the stability of elliptic forms in the equilibrium of turbulent fluid”. In 1892 he obtained his Ph.D. at the University Moscow with the dissertation “A general task about the stability of motion”.

**Professional Career:**
In 1895 Lyapunov became private lecturer (Dozent) for Mechanics at the University Kharkov, and, after having obtained his Ph.D. in 1892, he became Professor. After Chebyshev’s death in 1894, he became head of the department of Applied Mathematics in 1901 at the Academy of Sciences in St. Petersburg. Among others he did research on probability theory. In 1899, he developed the Lyapunov methods. From 1899-1902 Lyapunov was president of the mathematical society in Kharkov. In 1900, he was elected as corresponding member of the Russian Academy of Sciences and in October 1901 head of the department applied mathematics as successor of Chebyshev. In 1917 he took a position at the University Odessa.

**Important Publications:**


- “Sur l’instabilité de l’équilibre dans certains cas où la fonction de forces n’est pas un maximum”, *Journal de mathématiques pures et appliquées* 3 (1897) pp. 81-94.


Scientific Honors:
Lyapunov was corresponding member of the Académie des Sciences in Paris and member of the Academia dei Lincei in Italy.

References and Literature:
• Peter Imkeller, *The moment Lyapunov exponent for conservative systems with small periodic and random perturbations* (Berlin 2001).
• Antonio Politi, *From synchronization to Lyapunov exponents and back* (Berlin 2006).
• Christian Pommer, *Solution of the Lyapunov matrix equation for a system with a time-dependent stiffness matrix* (Lyngbi 2002).
• Nikolay Sidorov, *Lyapunov-Schmidt methods in nonlinear analysis and applications* (Dordrecht 2002).
• Vicente Vergara, *Lyapunov functions and convergence to steady state for differential equations of fractional order* (Halle 2007).
tory/Mathematicians/Lyapunov.html (20 August 2007).

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