Biographical Encyclopedia of Astronomers

Markov, Andrei Andreevich

Born Ryazan, Russia, 14 June 1856

Died Petrograd (Saint Petersburg, Russia), 20 May 1922

Russian mathematician Andrei Markov had the good fortune to work with Pafnuty Chebyshev (of the polynomials) at Saint Petersburg (1874–1878). Many of his contributions were in the area of probability theory, including a refinement of the central limit theorem invented by Pierre de Laplace. He is best known for Markov chains. Roughly, these describe systems and processes whose future can be predicted from (completely known) current conditions with no knowledge of the system's past history. Some astronomical systems, for instance clusters of stars (treated as point masses), can be thought of as Markovian. In practice, precise knowledge of everything about the system at one time is never available. Markov's contemporary A. Lyapunov wrote down criteria for deciding when imprecise knowledge of a system would lead to its future behavior evolving in totally unpredictable directions. Such systems are called chaotic and can be recognized by the so-called Lyapunov exponent.

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Selected Reference

Anon. (1994). "Markov." In *The Biographical Dictionary of Scientists*, edited by Roy Porter, 2nd ed., p. 462. New York: Oxford University Press