



*Stable and Random
Motions in Dynamical
Systems: With
Special Emphasis on
Celestial Mechanics*

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Jürgen Moser

One of the world's leading mathematicians, Jürgen Moser developed theories in celestial mechanics and many other aspects of mathematics. He is most renowned for

his work on the Kolmogorov-Arnold-Moser theorem.

Stable and Random Motions in Dynamical Systems examines how to decide when a dynamical system has stable or unstable behavior. The book was motivated by the stability problem in celestial mechanics: can we prove that the solar system is stable? Moser explains the historical roots of the question, makes it precise, and sets up the mathematical questions that the rest of the book addresses: the Kolmogorov-Arnold-Moser theorem, dealing with quasi-periodic motions, and the Smale-Birkhoff theorem, connecting dynamical systems with Bernoulli processes. These are the “stable” and “random” aspects to which the title alludes. The book resulted from the inaugural Hermann Weyl Lectures at the Institute for Advanced Study in 1972.

Originally published in the Annals of Mathematics Studies series, the book was reissued in the Princeton Landmarks in Mathematics series in 2001. In the foreword to this most recent edition, Princeton mathematician Philip J. Holmes wrote, “After almost thirty years, Moser’s lectures are still one of the best entrées to the fascinating worlds of order and chaos in dynamics.”