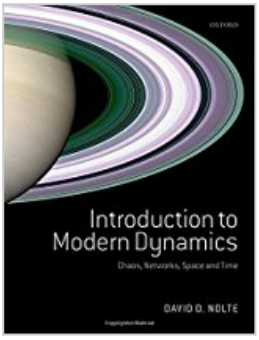

Introduction to Modern Dynamics: Chaos, Networks, Space and Time

By David D. Nolte

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The best parts of physics are the last topics that our students ever see. These are the exciting new frontiers of nonlinear and complex systems that are at the forefront of university research and are the basis of many high-tech businesses. Topics such as traffic on the World Wide Web, the spread of epidemics through globally-mobile populations, or the synchronization of global economies are governed by universal principles just as profound as Newton's laws. Nonetheless, the conventional university physics curriculum reserves most of these topics for advanced graduate study. Two justifications are given for this situation: first, that the mathematical tools needed to understand these topics are beyond the skill set of undergraduate students, and second, that these are specialty topics with no common theme and little overlap.

Introduction to Modern Dynamics dispels these myths. The structure of this book combines the three main topics of modern dynamics - chaos theory, dynamics on complex networks, and general relativity - into a coherent framework. By taking a geometric view of physics, concentrating on the time evolution of physical systems as trajectories through abstract spaces, these topics share a common and simple mathematical language through which any student can gain a unified physical intuition. Given the growing importance of complex dynamical systems in many areas of science and technology, this text provides students with an up-to-date foundation for their future careers.

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Editorial Review

Review

"Nolte's book is a bold attempt toward updating and energizing the physics curriculum. ... I encourage instructors to give it a look and see if there is a place for it in their teaching." --*David Feldman, Physics Today*

About the Author

David D. Nolte is the Edward M. Purcell Distinguished Professor of Physics at Purdue University, and an internationally recognized researcher in laser photonics. He blogs regularly at http://www.works.bepress.com/ddnolte/.

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