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A beautiful piece of mathematics, Noether's Theorem touches on every aspect of physics. Emmy Noether proved her theorem in 1915 and published it in 1918. This profound concept demonstrates the connection between conservation laws and symmetries. For instance, the theorem shows that a system invariant under translations of time, space, or rotation will obey the laws of conservation of energy, linear momentum, or angular momentum, respectively. This exciting result offers a rich unifying principle for all of physics.

Dwight E. Neuenschwander's introduction to the theorem's genesis, applications, and consequences artfully unpacks its universal importance and unsurpassed elegance. Drawing from over thirty years of teaching the subject, Neuenschwander uses mechanics, optics,
geometry, and field theory to point the way to a deep understanding of Noether's Theorem. The three sections provide a step-by-step, simple approach to the less-complex concepts surrounding the theorem, in turn instilling the knowledge and confidence needed to grasp the full wonder it encompasses. Illustrations and worked examples throughout each chapter serve as signposts on the way to this apex of physics.

Noether's Theorem is an essential principle of post-introductory physics. This handy guide includes end-of-chapter questions for review and appendixes detailing key related physics concepts for further study.

"Neuenschwander displays the instincts of a good teacher and writes clearly. Using Noether's Theorem as an overarching principle across areas of theoretical physics, he helps students gain a more integrated picture of what sometimes seem to be independent courses_an ever-important thing for undergraduate physics education."_Dr. Cliff Chancey, University of Northern Iowa

"Recommended."_Choice