

The Physics of Neutrinos

By Vernon Barger, Danny Marfatia, Kerry Whisnant

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The physics of neutrinos--uncharged elementary particles that are key to helping us better understand the nature of our universe--is one of the most exciting frontiers of modern science. This book provides a comprehensive overview of neutrino physics today and explores promising new avenues of inquiry that could lead to future breakthroughs.

The Physics of Neutrinos begins with a concise history of the field and a tutorial on the fundamental properties of neutrinos, and goes on to discuss how the three neutrino types interchange identities as they propagate from their sources to detectors. The book shows how studies of neutrinos produced by such phenomena as cosmic rays in the atmosphere and nuclear reactions in the solar interior provide striking evidence that neutrinos have mass, and it traces our astounding progress in deciphering the baffling experimental findings involving neutrinos. The discovery of neutrino mass offers the first indication of a new kind of physics that goes beyond the Standard Model of elementary particles, and this book considers the unanticipated patterns in the masses and mixings of neutrinos in the framework of proposed new theoretical models.

The Physics of Neutrinos maps out the ambitious future facilities and experiments that will advance our knowledge of neutrinos, and explains why the way forward in solving the outstanding questions in neutrino science will require the collective efforts of particle physics, nuclear physics, astrophysics, and cosmology.

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Editorial Review

From the Back Cover

'This is a very useful book written by notable experts in the field. It covers all aspects of the theory, phenomenology, experiment, and astrophysical implications of neutrinos."**--Paul Langacker, professor emeritus, University of Pennsylvania**

"This book provides a comprehensive snapshot of the current state of neutrino physics, and is a useful reference for particle physicists and astrophysicists who are interested in learning what has been going on in the field. All three authors have played a major role in advancing our understanding of neutrino physics, and are very well positioned to write a book on the subject."**--André de Gouvêa, Northwestern University**

About the Author

Vernon Barger is professor of physics at the University of Wisconsin-Madison. He is the coauthor of "Collider Physics." Danny Marfatia is associate professor of physics at the University of Kansas. Kerry Whisnant is professor of physics at Iowa State University.

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