

Diagrammatica: The Path to Feynman Diagrams (Cambridge Lecture Notes in Physics)

By Martinus Veltman

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This book provides an easily accessible introduction to quantum field theory via Feynman rules and calculations in particle physics. The aim is to make clear what the physical foundations of present day field theory are, to clarify the physical content of Feynman rules, and to outline their domain of applicability. The book begins with a brief review of some aspects of Einstein's theory of relativity that are of particular importance for field theory, before going on to consider the relativistic quantum mechanics of free particles, interacting fields, and particles with spin. The techniques learned in the chapters are then demonstrated in examples that might be encountered in real accelerator physics. Further chapters contain discussions on renormalization, massive and massless vector fields and unitarity. A final chapter presents concluding arguments concerning quantum electrodynamics. The book includes valuable appendices that review some essential mathematics, including complex spaces, matrices, the CBH equation, traces and dimensional regularization. An appendix containing a comprehensive summary of the rules and conventions used is followed by an appendix specifying the full Lagrangian of the Standard Model and the corresponding Feynman rules. To make the book useful for a wide audience a final appendix provides a discussion on the metric used, and an easy to use dictionary connecting equations written with different metric. Written as a textbook, many diagrams and examples are included.

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Diagrammatica: The Path to Feynman Diagrams (Cambridge Lecture Notes in Physics) By Martinus Veltman Bibliography

- Sales Rank: #1598898 in Books
- Brand: Brand: Cambridge University Press
- Published on: 1994-07-29
- Original language: English
- Number of items: 1
- Dimensions: 8.98" h x .67" w x 5.98" l, 1.00 pounds
- Binding: Paperback
- 300 pages

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Review
"...a masterful introduction to quantum field theory and its application to elementary particle physics through Feynman diagrams. The approach is constructive rather than deductive, and the book offers many fine insights into the physics content of results that may be thought of as purely mathematical." Ernest Ma and Jose Wudka, Physics Today

"...would be a useful and solid starting point for a novice field theorist..." R. Delbourgo, Mathematical Reviews

From the Back Cover
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