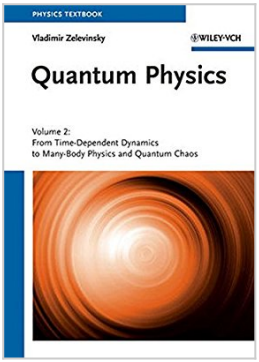

Quantum Physics: Volume 2 - From Time-Dependent Dynamics to Many-Body Physics and Quantum Chaos

By Vladimir Zelevinsky

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This two-volume set can be naturally divided into two semester courses, and contains a full modern graduate course in quantum physics. The idea is to teach graduate students how to practically use quantum physics and theory, presenting the fundamental knowledge, and gradually moving on to applications, including atomic, nuclear and solid state physics, as well as modern subfields, such as quantum chaos and quantum entanglement. The book starts with basic quantum problems, which do not require full quantum formalism but allow the student to gain the necessary experience and elements of quantum thinking. Only then does the fundamental Schr?dinger equation appear. The author has included topics that are not usually covered in standard textbooks and has written the book in such a way that every topic contains varying layers of difficulty, so that the instructor can decide where to stop. Although supplementary sources are not required, "Further reading" is given for each chapter, including references to scientific journals and publications, and a glossary is also provided.
Problems and solutions are integrated throughout the text.

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Editorial Review

Review
From the reviewers of the proposal:
"I am deeply convinced that this book will be of much value for any students entering the ?quantum world?. It will also be a useful reference for the more experienced scientists, as its topics extend into more recent achievements and approaches."
"I expect that this work will be of the highest benefit for teachers and students."
"This proposal clearly breathes a lot of expertise and experience in teaching this subject and what is lacking. This advanced textbook would represent a very attractive choice, in particular for curricula including advanced quantum theory courses."
"Due to the chosen problem-solving oriented approach, and its structure, this book/or book set is unique and very attractive for curricula on advanced quantum physics."
"There is no doubt that he (the author) can safely be regarded as being easily in the top quartile, and probably in the top 10%, of the world's leading theoretical ph

"This two-volume set can be naturally divided into two semester courses, and contains a full modern graduate course in quantum physics." (ETDE Energy database, 2011)

From the Back Cover
This two-volume set, naturally divided into two semester parts, contains a full modern graduate course in quantum physics. The idea is to teach graduate students how to practically use quantum theory by presenting the fundamental knowledge and gradually moving on to broad applications, including atomic, nuclear, relativistic and many-body physics, as well as subfields of current interest, such as quantum chaos and quantum entanglement. The author discusses topics that are not usually covered in standard textbooks and has written the book in such a way that every subject contains varying layers of difficulty, so that the instructor can decide where to stop. Problems and solutions are integrated throughout the text.

From the content of Volume 2:

- Non-stationary Perturbations
- Periodic Perturbations
- Scattering of Fast Charged Particles
- Photons
- Photoabsorption and Photoemission
- Dispersion and Scattering of Light
- Basics of Quantum Scattering
- Method of Partial Waves
- More about Scattering
- Reactions, Decays and Resonances
- Towards Relativistic Quantum Mechanics
- Dirac Equation: Formalism
- Dirac Equation: Solutions
- Discrete Symmetries, Neutrino and Kaons
- Identical Particles
- Isospin

- Secondary Quantization
- Atomic and Nuclear Configurations
- Fermions
- Collective Excitations
- Bosons
- Fermion Pairing and Super-conductivity
- Density Matrix
- Quantum Chaos
- Quantum Entanglement

About the Author
Vladimir Zelevinsky is Professor at the Department of Physica and Astronomy and National Superconducting Cyclotron laboratory at Michigan State University, USA. He graduated from Moscow University and worked for many years at the Budker Institute of Nuclear Physics in Novosibirsk where he got his Candidate of Science and highest Doctor of Science degrees (equivalent to a Ph.D.). In the eighties he was Head of Theory Division at the Budker Institute and Head of Theoretical Physics at Novosibirsk University. He spent three years as a visiting professor at the Niels Bohr Institute in Copenhagen. He is the author of over 200 scientific publications, co-editor of the *EPL* journal and Associate Editor of the *Nuclear Physics* journal. He has also received many awards as the best teacher at MSU.

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