

The Physics of the Manhattan Project

By Bruce Cameron Reed

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The development of nuclear weapons during the Manhattan Project is one of the most significant scientific events of the twentieth century. This book, prepared by a gifted teacher of physics, explores the challenges that faced the members of the Manhattan project. In doing so it gives a clear introduction to fission weapons at the level of an upper-level undergraduate physics student. Details of nuclear reactions, their energy release, the fission process, how critical masses can be estimated, how fissile materials are produced, and what factors complicate bomb design are covered. An extensive list of references and a number of problems for self-study are included. Links are given to several spreadsheets with which users can run many of the calculations for themselves.

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Editorial Review

Review

From the reviews of the second edition:

“Is it possible to give undergraduate physics students--those who have been introduced to classical mechanics, statistical thermodynamics, and nuclear physics--an understanding of the basic ideas behind nuclear weapons and nuclear power? Sticking exclusively to nuclear fission physics, Reed (Alma College) attempts to do so, relegating much of the physics to a series of appendixes. … There are ample physics references throughout the book. Summing Up: Recommended. Upper-division undergraduates and graduate students.” (A. M. Saperstein, Choice, Vol. 48 (9), May, 2011)

“This book describes, in complete detail, a course for advanced undergraduate physics majors, on the various physics problems involved in the World War II Manhattan Project that initiated the Nuclear Age. … if one wants to provide an advanced undergraduate course on applications involving a great deal of interesting physics, this would be an ideal textbook. … for students with an interest in nuclear bombs and nuclear reactors, this course would be not only satisfying but exciting.” (Bernard L. Cohen, Physics and Society, Vol. 40 (3), July, 2011)

“This second edition is enhanced in content and paper and has print quality text. … A large number of figures and graphs are included within the chapters and appendices to better assist the reader in following the text. … an excellent resource on the physics of fission bombs and I highly recommend it to all enthusiasts of the Manhattan Project and to college educators who want to teach a course in practical application of nuclear physics at an undergraduate level.” (Dimitris Mihailidis, Medical Physics, Vol. 38 (3), March, 2011)

From the Back Cover
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