

## A new monograph on synchrotron radiation

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***Synchrotron Radiation Theory and Its Development. In Memory of I M Ternov*** (Ed. V A Bordovitsyn) (Singapore: World Scientific, 1999) xxx + 447 pp.

World Scientific has recently published a book entitled *Synchrotron Radiation Theory and Its Development* dedicated to the memory of the outstanding Russian theoretical physicist Igor' Mikhaïlovich Ternov (1921–1996). All the chapters of this volume are written by I M Ternov's co-workers and disciples and edited by V A Bordovitsyn (except for the last one which was included at the request of the publishing house).

The new book on synchrotron radiation is a valuable addition to the volume of collected papers under the heading of *Sinkhrotronnoe Izluchenie* (Synchrotron Radiation) edited by A A Sokolov and I M Ternov, which was published in 1996 by Nauka publishers, and to the monographs by the same authors *Synchrotron Radiation* (Berlin: Akademie-Verlag, 1968) and *Relyativistskiĭ Elektron* (Relativistic Electron) (Moscow: Nauka, 1974, 1983). The book under consideration contains both a comprehensive review of the classical and quantum theory of synchrotron radiation and a detailed examination of current developments and applications of the theory of radiation emitted by relativistic particles. Synchrotron radiation is a bright illustration of a well-developed physical theory which has greatly contributed not only to the understanding of fundamental laws of nature but is being extensively used in up-to-date precision electronic technologies and many other fields of industry and science, including biology and medicine.

The volume opens with a review on synchrotron radiation first published by I M Ternov in *Uspekhi Fizicheskikh Nauk* (*Physics – Uspekhi*) in 1995, during the author's lifetime. The basic organization of the book is best apparent from a brief list of contents:

Chapter 1. Classical theory of synchrotron radiation (V A Bordovitsyn, V S Gushchina)

Chapter 2. Spin properties of relativistic particles (V A Bordovitsyn, V S Gushchina)

Chapter 3. Quantum theory of synchrotron radiation (V G Bagrov)

Chapter 4. Spin light (V A Bordovitsyn, V S Gushchina)

Chapter 5. Undulator radiation (V Ya Épp)

Chapter 6. Radiation in special electrodynamic systems (V G Bagrov, V Ya Épp)

Chapter 7. Synchrotron radiation in a strong magnetic field (O F Dorofeev, A V Borisov, V Ch Zhukovskii)

Chapter 8. Synchrotron radiation in astrophysics (G S Bisnovatyĭ-Kogan)

The book is fully-illustrated throughout using computer graphics technology and comprehensively referenced (overall, it contains almost 600 bibliographic records).

There is little doubt that this new monograph, though published in English, will be interesting and useful to a wide circle of readers including not only physicists beginning to study the theory of synchrotron radiation but also those with experience in this field.

It should be emphasized that Russian scientists have made a definitive contribution to the construction of the modern theory of synchrotron radiation (D D Ivanenko, I Ya Pomeranchuk, A A Sokolov, I M Ternov, N P Klepikov, V L Ginzburg). It is also well-known that the theory continues to be developed. Therefore, Russian physicists working on the problem need a new book on synchrotron radiation in their mother tongue.

Hence, the urgent necessity of publishing a Russian translation of the reviewed book complemented by a more detailed examination of certain important problems (e.g., induced synchrotron radiation, synchro-Compton radiation, etc.) is undoubtedly justified.

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