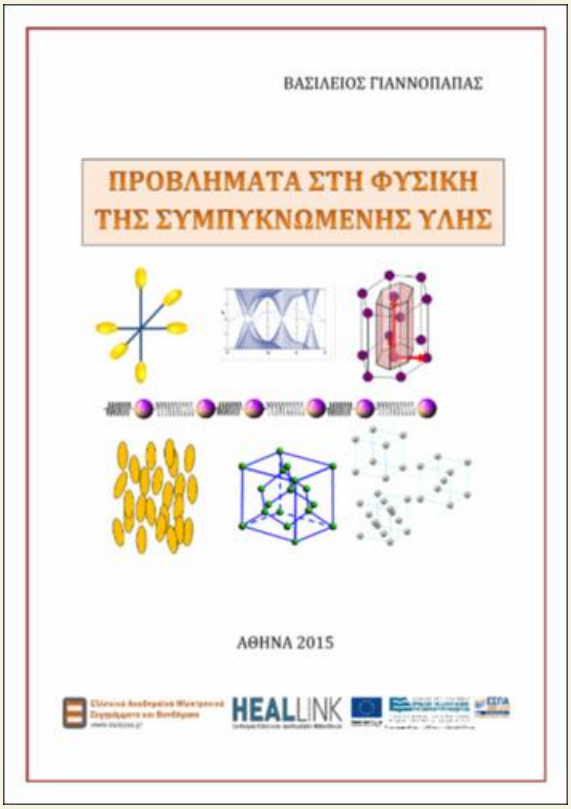


## METADATA

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**Abstract**

This textbook is intended for undergraduate students studying in physics departments/schools and contains solved problems in condensed matter physics (CMP). This textbook is perhaps the first book to solve problems in CMP, while serving as a supplement to a main textbook that traditionally contains the relevant theory along with, for the most part, unsolved exercises (if it contains exercises at all). Due to the complexity of problems in CMP, many of them cannot be solved analytically and therefore require numerical analysis methods. A typical example is the determination of energy bands in a one-dimensional solid described by the Kronig-Penney model—perhaps the simplest crystal solid imaginable— which requires the numerical solution of nonlinear (transcendental) equations (see relevant excerpt from the indicative chapter). Thus, this textbook also contains problems that can only be solved using numerical methods, where the corresponding algorithms are presented in source code in FORTRAN 90, which is the dominant programming language in the physical sciences. The problems solved refer to the syllabus corresponding to an introductory course in FSY, which, in brief, covers the topics of chemical bonding in solids, crystal structure and diffraction, lattice dynamics (phonons), thermal properties, the free electron model, electron energy bands, and semiconductors.

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