

Preface

Special Topic Issue “Optical and Vibrational Spectroscopies”

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This special topic issue has been prepared on the occasion of the seventy fifth birthday of Manuel Cardona. The impact of his scientific career, in particular in the field of optical spectroscopies, is manifested in more than 1200 publications, an $h = 98$ Hirsch index, and contributions co-authored with scientists of more than 40 different countries. Awarded the Ph.D. at Harvard University in 1959, Manuel's career extended over two periods, first in USA at RCA Laboratories and Brown University, and from 1971 as a founder and director of the Max Planck Institute for Solid State Research in Stuttgart, Germany, until 1999, when he became director emeritus.

His contributions range several domains of solid-state physics, with emphasis in optical, vibrational, and electronic properties of superconductors and semiconductors. With 81 Ph.D. students who graduated under his supervision, he is appreciated both as a highly cited researcher, as a mentor, and as a friend by many of the scientists who collaborated with him. Despite his retirement, he is still actively working in fields such as isotopic effects on the specific heat, high pressure research, *ab initio* calculations including self-energy corrections and spin-orbit splitting contributions, and bibliometric studies.

The present issue contains a collection of invited contributions of participants to the “Optical and Vibrational Spectroscopies Symposium: a tribute to Manuel Cardona”, celebrated in Querétaro, Mexico, August 18–20, 2010. As the reader will appreciate, a large diversity of topics is covered, related to fundamental issues in both semiconductor and superconductor physics. They represent the wide spectrum of Manuel's contribution in the sense that one or more co-authors have shared with him scientific endeavours in their careers.

Relevant review papers are reported here on the areas of superconductivity in iron pnictides, optical properties of nanostructures, electron holography in nitrides, and the quantum Boltzmann equation. On the other hand, contributions from other fields where Manuel Cardona was quite active are also included, such as vibrational spectroscopies (nanostructures, surface and bulk), Raman scattering in nanomaterials, role of vacancies in the electronic structure of semiconductors, together with a bibliometric study of Manuel Cardona's scientific contributions.

We thank the Editor in Chief, Prof. Dr. Ulrich Eckern for welcoming the idea of publishing the contributions in “Annalen der Physik” and participating in the symposium. We would like also to acknowledge the support from CINVESTAV México, ULL Spain, CONCYTEQ, CLAF, and UASLP to make this nice event possible and in particular to the Querétaro Autonomous University (UAQ), where the meeting was held.

We wish Manuel many more years of fruitful scientific activities, teachings, and friendship.

Aldo Humberto Romero & Jorge Serrano
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