Low-Dimensional Functional Materials

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Low-Dimensional Functional Materials

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Preface

This book presents proceedings of the NATO Advanced Research Wokshop "Recent Trends in Energy Security: With Special Emphasis on Low-Dimensional Functional Materials" held in Tashkent, October 15–19, 2012. The objective of the conference was to discuss recent advances, problems and prospects in the physics of low-dimensional nanoscale materials from the viewpoint of their practical application in energy and resource saving. Currently such materials are being considered to play key role in the development of contemporary nanotechnology. The workshop brought together experts working on different issues of nanoscale physics such as quantum transport, organic photovoltaics, hydrogen storage, carbon nanostructures, superconductivity and others. Talks presented by the speakers were concentrated on photovoltaic elements on the basis of low-dimensional materials, graphene, CNT, fullerene, particle and heat transport in low-dimensional nanoscale systems, thermoelectric effect on low-dimensional materials, quantum networks and hydrogen in low-dimensional materials. Special focus was brought to practical applications of low-dimensional functional materials in renewable energy, energy conversion and storage. Total 55 talks were presented by senior and young speakers as 35- and 15-min long and short talks, respectively.

Broad audience of experimental and theoretical physicists was attracted by extensive panel discussions which were very helpful for deeper understanding of different issues of the physics of low-dimensional functional materials. Concluding remarks have been presented to some of the speakers at the end of Workshop.

The Workshop has been efficiently and successfully organized due to the local organizing committee with members T. Muminov, A.A. Saidov, K. Sharipov, K. Nakamura, B. Eshchanov, J. Yusupov, D. Otajanov, B. Umrzakov and B. Oksengendler. A group of young researchers and students from Turin Polytechnic University in Tashkent and National University of Uzbekistan assisted for several important organizational matters.

In addition, we would like to thank Jambul Yusupov, Doniyor Babajanov and Davran Otajanov for their valuable assistance in preparing this proceedings. Also, our special thanks go to Olga Karpova for her great help with the secretarial duties, before, during and after the conference.

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Düsseldorf, Germany — *Reinhold Egger*
Tashkent, Uzbekistan — *Davron Matrasulov*
January, 2013 — *Khamdam Rakhimov*

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