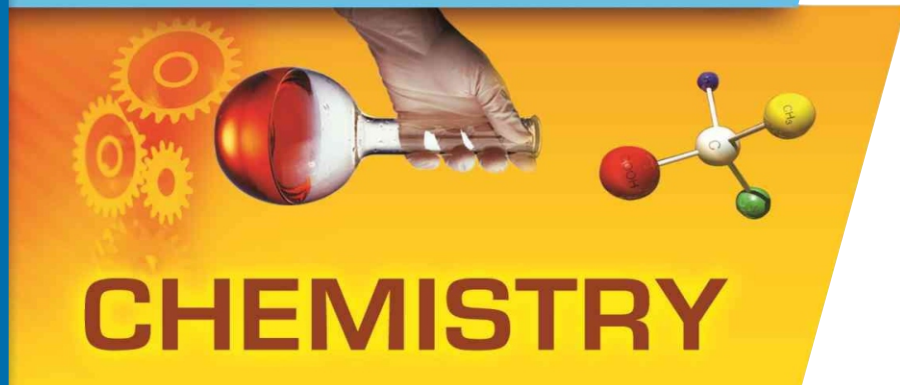
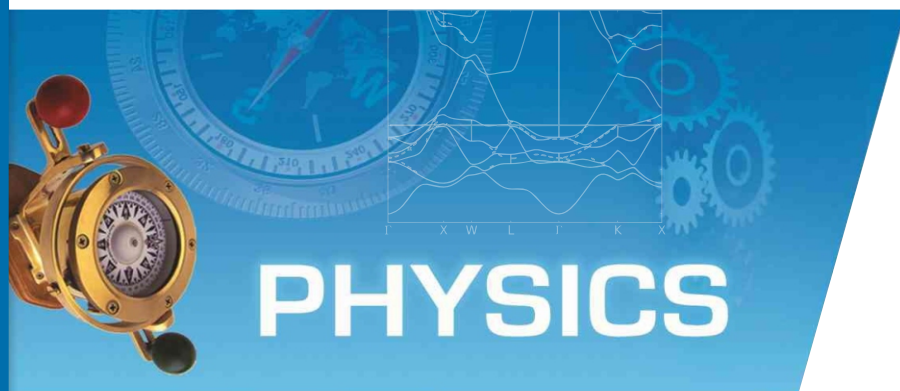


International Conference on
SYSTEMS AND PROCESSES
in Physics, Chemistry and Biology
(March 1-3, 2018)



ICSPPCB-2018



Editors:

Dr. Debesh R. Roy
Dr. Utpal Sarkar

Organized by
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Physics, Chemistry and Biology**

Editors

DR. DEBESH R. ROY

DR. UTPAL SARKAR

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EDITOR'S PROFILE

Dr. Debesh R. Roy, presently working as an Assistant Professor in the Department of Applied Physics, S. V. National Institute of Technology, Surat, India. He has obtained his M. Sc. (Physics) from the Visva-Bharati University, Shantiniketan, in 2002 followed by his Ph.D. degree in the area of 'Chemical and Materials Physics' from **Indian Institute of Technology Kharagpur**, Kharagpur in 2008. Dr. Roy worked as a **Post Doctoral Associate** at **Virginia Commonwealth University**, Richmond, USA during 2009-2010. His primary research interest includes developing novel nanomaterials from potential atomic & molecular cluster motifs, under density functional framework. Among 80 of his referred and reputed publications, 60 journals are cited over **2300** times in total with *h*-index of **21** and *i10*-index of **35**. Many of his articles are recognized with most citation awards, cover articles, hot articles etc. Currently, he is serving as **Editorial Board Member** of the journals *Current Nanomaterials* (Bentham Sci., USA), *Nano Research & Applications* (Insight Medical Publishing, USA) and *J. Macro and Nano Phys.* (D. J. Publications, India). He has delivered a number of invited talks in the various parts of India and abroad including Germany, USA, Bangkok etc. Dr. Roy is a recipient of many prestigious awards including *Bharat Vikas Award 2017* (ISR Bhubaneswar), *Young Scientist Award 2012* (DST, GoI), *Junior Fellow Award 2011* (HWK, Germany), *Elsevier Top 50 Most Cited Article Award 2006* etc.

Dr. Utpal Sarkar did his Ph. D. from Indian Institute of Technology, Kharagpur on Density Functional Theory. Then he worked as a **DAAD fellow** in the field of Molecular Electronics in the University of Regensburg, Germany. As a **Post Doctoral Fellow**, he worked in **McMaster University**, Hamilton, Canada; **Commissariat à l'énergie atomique (CEA)**, Grenoble, France and in **University of Science and Technology of Lille**, France. At present he is an Assistant Professor in the Department of Physics of **Assam University**, Silchar. He is also a '**Regular Associate**' of '**The Abdus Salam International Centre for Theoretical Physics (ICTP)**', Trieste, Italy. Dr Sarkar has nearly 17 years research experience. His research interest includes conceptual Density Functional Theory, Nonlinear dynamics, Nanostructure simulation etc. Dr Sarkar published **52** research papers in **international journal** with a total of 72. Over **2477** citations, *h*-index: **21**, *i*-10: **31** represent the quality of his work.

PREFACE

The International Conference on Systems and Processes in Physics, Chemistry and Biology (ICSPPCB 2018) is organized by the Department of Physics of Assam University, Silchar during 1-3 March, 2018. The main goal of the conference is to develop skill and interest among young researchers and it will provide a golden opportunity to the students and researchers to gain experience by interacting with senior scientists, which may lead to collaborations in cutting-edge interdisciplinary research at the interface between physics, chemistry and biology. The ICSPPCB 2018 is enriched with more than thirty invited lectures from the eminent scientists across the globe on the theme of the conference as well as oral and poster presentations from the young academicians/scientists and research scholars. *The inaugural session of ICSPPCB 2018 is dedicated to celebrate the 60th birthday of Prof. Pratim K. Chattaraj, an eminent scientist in this field.*

Most of the systems in nature are complex essentially due to the large number of variables needed for their specification. Phenomena occurring in nature are difficult to realize because of the multiple concurrent events augmented by nonlinear interactions among them. The spatio-temporal structures of the systems are also far from equilibrium. These types of complex systems and processes occur in physics, chemistry, biology and other disciplines. Also, associated fundamental physical and chemical concepts help us to unravel this complexity. The diverse range of systems and processes arising out of those complex interactions can be analyzed through the principles of classical and quantum mechanics, occasionally augmented by statistical mechanics. However, their understanding is still a challenging issue in current research. A combined approach, consisting of theoretical, experimental and simulation techniques, is required to understand the structure and dynamics of these systems and processes. This conference comprehends to shed light on various phenomena occurring in physical, chemical and biological systems. A total of 35 full length papers are identified for inclusion the book under six different areas, viz. i) Electronic structure calculations and molecular dynamics, ii) Nano and bulk materials, iii) Nano-bio systems, iv) Spectroscopy, v) Bioinformatics, drug design and biologically important molecules and vi) Molecular electronics. We extend our sincere thanks to all the contributed authors for their timely submission and cooperation.

We would like to take this opportunity to thank various committee chairs and members for their tireless effort in making this event a grant success. We place our sincere thanks to the invited reviewers for their support in critical review of the contributed papers. The various funding agencies including North Eastern Council (NEC), Shillong, India; Science and Engineering Research Board (SERB), New Delhi, India; Council of Scientific & Industrial Research (CSIR), New Delhi, India; Assam University, Silchar, India; International Centre for Theoretical Physics (ICTP), Trieste, Italy are gratefully acknowledged for their sponsorships for the successful conduct the conference. The support extended by Nandan Graphics & Library Services, Surat in bringing out this book on time is highly appreciated.

DEBESH R. ROY
UTPAL SARKAR

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