

information on the presence of hydrogen-bearing compounds around the north and south poles of the moon. But I am not sure if we know for sure that this also indicates the distribution of water ice as mentioned in the caption of figure 3.7.

Reading through different chapters sometimes gives you a feeling that the book has been compiled in a hurry. The information flow in different chapters is rather disjointed and there is certain lack of connectivity. Nevertheless, the utility of the book as a source of information on the moon is unquestionable. The chapter on giant impact hypothesis may not be a purist's delight. Some of the information presented on the giant impact obviously is speculative in nature and sometimes could be a bit confusing to the first time reader. But one should understand that it is rather difficult to present complex astrophysical phenomenon leading to the formation of the moon in few pages, more so in a language that students and non-specialist would easily digest.

Readers having high expectations on getting lot of details about *Chandrayaan-1* mission from this book will be disappointed. The description of the maiden moon mission is rather brief. It is evident that this book was planned and executed before the actual launch of the moon mission. Maybe the writer was a bit more conservative and did not want to sound jingoistic especially in the backdrop of umpteen number of impediments associated with such projects. Some basic details on the challenges on designing payloads for the moon mission would have highlighted the difficulties in space missions. It is important to know that *Chandrayaan-1* was the only mission to moon where 16 sophisticated instruments (although in the book only 11 have been mentioned) from different parts of the world were carried as payloads. To the



best of my knowledge, on an average only 6–8 instruments have been carried on-board in the earlier moon probes launched by other countries. It is rather amusing to note that even a developing country like Bulgaria had a payload on *Chandrayaan-1*. System integration of various payloads and thermal management would have been the biggest technical challenges in India's moon mission. The description of some of the payloads is crisp and can be easily comprehended by non-specialists.

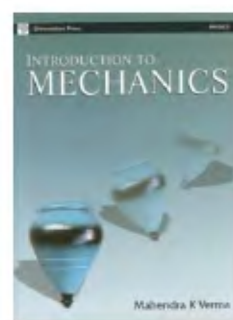
The injection of the probe into the moon's gravitational field after breaking the shackles of the earth's gravitational field is one of the most demanding exercises in the entire mission. Many of the earlier missions had failed in this stage. Some discussion on this topic would have clearly brought out the technical challenges encountered in this mission. But again the efforts of the author should be appreciated in trying to provide a concise description of the moon and *Chandrayaan-1* without getting embroiled in lot of technical details that may overawe the students and non-specialists who would love to read a book of this nature.

I recently had an opportunity to listen and discuss with Annadurai who is the projector director of *Chandrayaan-1*. One of the startling facts that he revealed during the course of his lecture was that the total cost of the entire mission was around Rs 360 crores. In recent times, people have raised a question whether it is appropriate for a country like India where more than 70% of people are not able to spend Rs 20 a day, to carry out such fancy technological missions. In fact when I recently interacted with students from a rural suburb, a student from 9th standard did raise this question. In fact Annadurai mentioned that India can afford to have about 12 missions like *Chandrayaan-1* every month! The number of mobile phone users in India is around 50 crores. Even if they use Rs 100 to recharge every month we are already talking about Rs 5000 crores! This definitely implies that missions like this do not affect our poverty-alleviation programmes. I think no other nation on earth would have successfully completed a mission such as *Chandrayaan-1* in such a small budget. For a nation it is important to carry out technologically challenging missions from time to time and always thrive to be in the forefront of

science and technology. Only then will we as a nation be respected in the comity of nations. Without advancements in basic science, engineering and technology we can never dream of joining the bandwagon of developed nations. Nevertheless if you are looking for a quick guide to understand various aspects of moon and also *Chandrayaan-1* then you should read this book.

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Introduction to Mechanics. Mahendra K. Verma (ed.). Universities Press (India) Private Limited, 3-6-747/1/A & 3-6-754/1, Himayatnagar, Hyderabad 500 029. 2008. xiv + 341 pp. Price: Rs 290.

The science of mechanics, dealing with the motion and equilibrium of masses, is one of the oldest branches of physical sciences and has for its subject matter how and why things move. The book under review is designed to serve as an introductory text for undergraduate students of physics and engineering at the Indian Institutes of Technology. Because these students would have studied introductory mechanics in high school at the level of Halliday and Resnick¹, the book by Verma is designed to be a primer for future studies on advanced subjects in mechanics like quantum mechanics and statistical mechanics.

The book begins with a history of mechanics, forces, Newton's equations, central force problem, vibration analysis, energy and momentum and ends with an introduction to nonlinear dynamics and the special theory of relativity. Throughout, the author has made an attempt to highlight the concepts of absolute time and inertial frames, which were questioned and elegantly postulated by Ein-

stein in his special and general theories of relativity. The basic concepts expected of undergraduate students are adequately covered. Advanced subjects such as non-linear dynamics and special theory of relativity are also introduced to make the book appealing to students of advanced mechanics classes. The book would serve especially well in cases where mechanics is taught to students of core disciplines outside of engineering or physics.

Unfortunately the book fails to elucidate some important concepts due to lack of detail and clarity. Introductory sections to chapters are terse and could have been more descriptive, but instead read more like bulleted points made during class. Verma launches into the special theory of relativity without clearly establishing the limitations of Newtonian mechanics, the arguments by Mach² and the experiments by Michelson³ and Morley that laid the foundation for the development of the theories of relativity. Referencing to websites, such as Wikipedia or tripod.com, instead of classic treatises is rather unfortunate. It is not a good idea to recommend websites in lieu of basic texts, especially because many such websites are not monitored for correctness, but also because often they can be discontinued with very little notice. Several minor issues could be addressed in future editions: for example, the quality of figures could be better (e.g. the gyroscope (p. 262) or the block diagram demonstrating the different areas of physics (p. 12)). In places, text is repeated almost verbatim (see pages 22 and 142) although the material could easily have been paraphrased. The history of mechanics is both interesting and important, but this book fails to do justice to the vast body of existing literature by contributors who helped shape many of our current ideas.

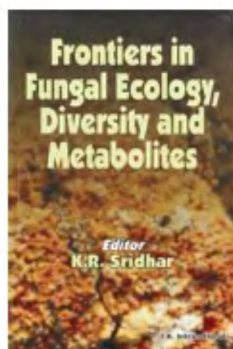
To sum up, the book by Verma is unambitious and seems catered to a small section of students. It cannot substitute classic texts⁴⁻⁶, but may serve well in places where mechanics is taught to students from core disciplines other than physics or engineering. An expansion of the introductory sections of each chapter and more creative problem sets could make this book a lot more attractive to a larger body of students.

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3. Michelson, A. A. and Morley, E. W., *Am. J. Soc.*, 1887, **34**, 333–345.
4. Rana, N. C. and Joag, P. S., *Classical Mechanics*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 1991.
5. Goldstein, H., Poole, C. P. and Safko, J. L., *Classical Mechanics*, Addison Wesley, 2001, 3rd edn.
6. Feynman, R. P., Leighton, R. B. and Sands, M., *The Feynman Lectures on Physics*, Addison Wesley, 2005.
7. Kleppner, D. and Kolenkow, R. J., *An Introduction to Mechanics, Special Indian Edition*, The Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.

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Frontiers in Fungal Ecology Diversity and Metabolites. K. R. Sridhar (ed.). I. K. International Publishing House Pvt. Ltd., S-25, Green Park Extension, Uphaar Cinema Market, New Delhi 110 016. 2009. XVI + 336 pp. Price: Rs 1195.

The book under review has aimed at emphasizing 'different aspects of contemporary research in mycology with a view to project the issues of ecology, diversity and metabolites'. The subject of ecology and diversity has been discussed in depth, ranging from freshwater hyphomycetes and mangrove fungi to arbuscular mycorrhizal forms and Antarctic lichens. Select fungal metabolites like toxins from *Fusarium*, peptaibols from *Trichoderma* and bioactive metabolites from endophytic fungi are discussed in five

chapters. Molecular taxonomy and phylogenetic tools for fungal identification are two chapters covering recent trends in fungal taxonomy. General topics like forest pathology in India and fungal infections in humans as well as chapters on yeast metabolism related to monocarboxylate transport and biocatalysis are also included. A final chapter on emerging trends in mycology has been written by the editor. An overview of the contents of the different chapters indicates that the compilation of information has been well organized and presented in a manner in which it would be easily understood by the reader. The topics discussed are wide-ranging and individual in nature. As such, a glimpse into their salient points becomes necessary while reviewing this book. Two chapters on aquatic hyphomycetes bring out the ecology and distribution of these unique fungal spores inhabiting decomposing aquatic vegetation and also occurring in river foams and points out the need for a better understanding of the factors that regulate their natural distribution in the ecosystem. The chapter on mangrove fungi from the Indian peninsula lists a large number of taxa including new genera and species and discusses aspects related to litter decomposition as well as their potential as important sources of bioactive metabolites. The importance of marine fungi as a source of novel secondary metabolites including antibiotics, anticoagulants and enzyme inhibitors has been discussed. There is a need for better understanding of the *in vitro* physiology of marine fungi including increasing their growth rates and sporulation before they can be more widely harnessed for technological applications.

The Trichomycetes represent a unique group of zygomycetous fungi inhabiting the gut cuticles of insects, crustaceans and millipedes and their systematics and physiology have been discussed. The diversity and adaptive response of lichens in Antarctica indicates that lichens would potentially colonize all ice-free areas in Antarctica and the possibility of discovering new taxa is high. In a study of the rhizosphere of endemic tree species belonging to Myristicaceae, 57 species of arbuscular mycorrhizal fungi belonging to six genera have been identified and the negative influence of human interference on the survival of their diversity has been focused. Studies on the modified mangrove and coastal wetland ecosystem