

BOOK REVIEW

Physics of Continuous Matter: Exotic and Everyday Phenomena in the Macroscopic World, 2nd ed., by B. Lautrup, Boca Raton, CRC Press, 2011, 696 pp., £36.99 (hardcover), ISBN 9781420077001. Scope: textbook. Level: undergraduate.

It is a pleasure to see that, six years after the release of the first edition, *Physics of Continuous Matter* now comes out in a revised and extended second edition. Throughout the book, the material has been slightly reorganised. A chapter on gravity has been removed, and three new chapters on the elasticity of slender rods, energy and entropy have been added. The number of illustrations and photographs has also notably increased.

I completely agree with the reviewer of the first edition (Contemp. Phys. 46 (2005), p. 463) that this book provides an excellent, modern introduction to the field of continuum mechanics. The second edition has been streamlined, and the structure of the presentation has been improved. The author emphasises the (few) general principles that underlie continuum mechanics, but at the same time covers several topics in great detail.

I am sure that this massive tome (almost 700 pages!) is on its best way to become a classic text in the field. The text is exceptionally clear and well structured, and the breadth of the fields from which the author chooses his illustrating examples is impressive. In the entire text I have found only a few misprints.

The power and beauty of continuum mechanics lies in the many phenomena that it can describe with just a handful of fundamental equations. The author discusses, among many other things, the stability of ships, the

origin of the tides, the expansion of the Universe in Newtonian cosmology, the formation of bathtub vortices, the functional principles of turbines, the properties of ocean waves, the structure of boundary layers, the physics of subsonic flight and the onset of thermal convection. Continuum mechanics is also always good for surprises: who had thought that there is currently no general theory that can fully describe the hydraulic jump in a kitchen sink that everyone has seen countless times when turning on the water?

I can warmly recommend this book to everyone with an interest in continuum mechanics, lecturers and students alike. Lecturers will find various historical anecdotes, innumerable examples and applications, and a modern account of almost all basic aspects of continuum mechanics that will provide an excellent foundation for a lecture course on this subject. Students can benefit from the author's deep physical insight into many difficult problems as well as his mastery of mathematical analysis. May they be inspired by the author's passion for continuum mechanics and appreciate this wonderful subject. After all, continuum mechanics is the basis for a large part of our daily life, and this book does a great job to make us aware of this fact.

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