

Book Review

Creep and Fracture of Ice: Erland M. Schulson and Paul Duval, Cambridge University Press, 2009; ISBN: 978-0-521-80620-6 (hardback), USD 130.00

VICTOR C. TSAI¹

Schulson and Duval provide an excellent review of topics related to the brittle and ductile deformation of water ice. Each chapter is relatively self-contained, and complete with a full set of good references. These references include most of the pioneering and influential papers on the respective topics and textbooks that provide the many details that are omitted for brevity. The book is, therefore, a good starting point for any study related to the mechanical behavior of ice. The focus of the book is on ordinary low-pressure ice but the authors do include one chapter (Chap. 8) on the high-pressure phases of ice that are important for some planetary bodies, though shocked ice is not discussed.

The main topics covered are the structure and microstructure of ice (Chaps. 2, 3); the physical properties, including elastic, ductile, fracture and frictional behavior (Chaps. 4, 5, 9); experimental

data on and models of ductile deformation (Chaps. 6, 7); brittle failure of confined and unconfined ice (Chaps. 10, 11); the ductile–brittle transition (Chap. 13); and applications of the previous topics to various observed phenomena (Chaps. 3, 6, 13–15). Each of these topics is treated in depth in at least one full chapter, with discussion of the underlying physical mechanisms highlighted in many sections and a focus on experimental methods in other sections.

The book is likely to be useful as a reference for experts in the field and for graduate students who are just learning about ice, although the price may be a little high for some. Overall, the book is a very good compilation of results, and I will enjoy having it in my personal library for years to come.

¹ Geologic Hazards Team, United States Geological Survey, Golden, CO, USA. E-mail: vtsai@post.harvard.edu