

scope is comprehensive, the focus on purely mathematical treatments tends to remove much of the context from its discussions. I would imagine needing to supplement it with another text, such as C. M. R. Fowler's *The Solid Earth: An Introduction to Global Geophysics* (2nd edition, Cambridge University Press, 2005), which discusses the plate-tectonic setting and the geologic and geophysical observations addressed by Schettino's analyses.

In 14 chapters, *Quantitative Plate Tectonics* covers all the major topics in solid-Earth geosciences for which plate tectonics is critical. It is divided into two sections: kinematics of plate tectonics and dynamics of the lithosphere and upper mantle. That separation requires some arbitrary placements. For example, earthquake processes are considered in the dynamics section, which means they are excluded from the discussion of what quantifies plate motions. As a result of such choices, the plate kinematics section relies heavily on magnetism and paleomagnetism in its treatment of constraining observations. The plate dynamics section has a great deal in common with Donald Turcotte and Gerald Schubert's *Geodynamics* (3rd edition, Cambridge University Press, 2014), the traditional mainstay of quantitative courses related to the physics of active-Earth processes. *Quantitative Plate Tectonics*, however, contains a more significant discussion of seismic-wave propagation and earthquake rupture.

The target audience for Schettino's text is not entirely clear. Although in his preface the author indicates that the book is aimed at readers from diverse backgrounds (geology, geography, engineering, and physics), the high level of mathematics and the advanced terminologies and notations would make it difficult for most geology and geography students. The treatments are elegant, but I fear much of that elegance would be lost on students who struggle to master basic mathematics. Also, in most cases, each chapter introduces new math and does not build on the math presented in previous chapters. Given those features, the text may be primarily suited for students of plate tectonics who are comfortable using sophisticated mathematics to describe processes.

Overall, the book fills a gap in current texts covering plate tectonics. It fills

the promise of its title by being highly quantitative; however, the background observations that motivate the quantification are less prominent. The book could be a nice addition to a scientist's library in that it does provide, in one volume, the underlying mathematics describing a wide range of processes. I am not sure, though, how I would use it in my teaching, given the high-level mathematics background it requires.

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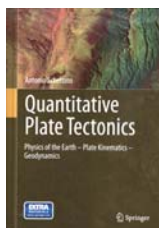
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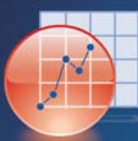
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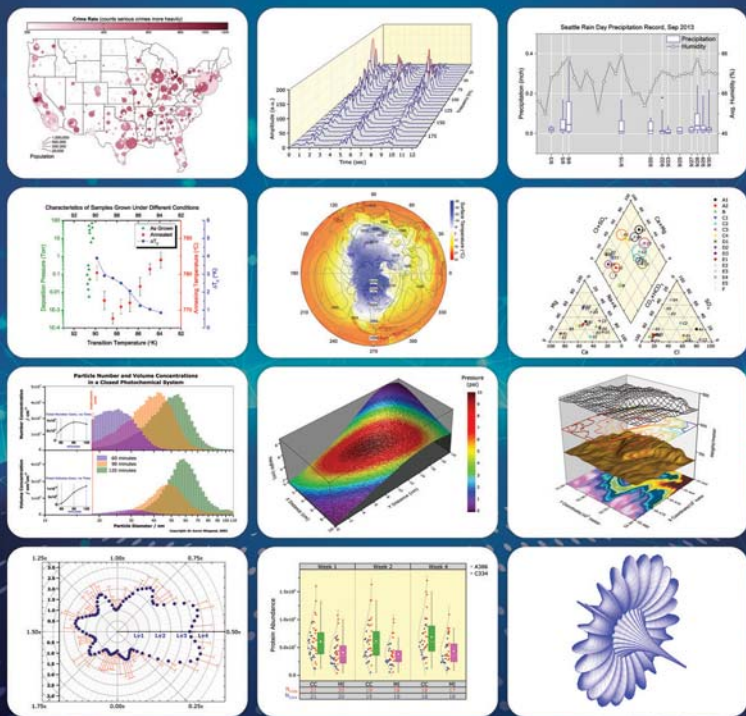
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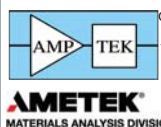


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