



# Fluid-Induced Seismicity

*By Serge A. Shapiro*

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## **Fluid-Induced Seismicity** By Serge A. Shapiro

The characterisation of fluid transport properties of rocks is one of the most important, yet difficult, challenges of reservoir geophysics, but is essential for optimal development of hydrocarbon and geothermal reservoirs. This book provides a quantitative introduction to the underlying physics, application, interpretation, and hazard aspects of fluid-induced seismicity with a particular focus on its spatio-temporal dynamics. It presents many real data examples of microseismic monitoring of hydraulic fracturing at hydrocarbon fields and of stimulations of enhanced geothermal systems. The author also covers introductory aspects of linear elasticity and poroelasticity theory, as well as elements of seismic rock physics and mechanics of earthquakes, enabling readers to develop a comprehensive understanding of the field. Fluid-Induced Seismicity is a valuable reference for researchers and graduate students working in the fields of geophysics, geology, geomechanics and petrophysics, and a practical guide for petroleum geoscientists and engineers working in the energy industry.

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## **Fluid-Induced Seismicity** By Serge A. Shapiro Bibliography

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### **Review**

"Shapiro has done a good job of developing the theory, presenting relevant case studies, and referencing appropriate current literature. The mathematical development is quite extensive but can be easily followed. The relevant knowledge gained, even without going through all the mathematics, shines through. This book is a current and relevant reference book for graduate students and practitioners in this area of geophysics. Both theoretical- and application-oriented geophysicists will derive value from this book."

The Leading Edge

### **About the Author**

Serge A. Shapiro is Professor of Geophysics at the Freie Universität Berlin, and since 2004, Director of the PHASE (PHysics and Application of Seismic Emission) university consortium project. From 2001 to 2008 he was one of the coordinators of the German Continental Deep Drilling Program. His research interests include seismogenic processes, wave phenomena, exploration seismology, and rock physics. He received the SEG Virgil Kauffman Gold Medal in 2013 for his work on fluid-induced seismicity and rock physics, and in 2004 was elected a Fellow of the Institute of Physics.

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