

1. Record Nr.	UNINA9910741199603321
Titolo	Computational Challenges in the Geosciences // edited by Clint Dawson, Margot Gerritsen
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2013
ISBN	9781461474340 1461474345
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (ix, 167 pages) : illustrations (some color)
Collana	The IMA Volumes in Mathematics and its Applications, , 2198-3224 ; ; 156
Disciplina	550.113
Soggetti	Mathematical physics Climatology Geophysics Mathematical Physics Climate Sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"This volume is based on the workshop 'Societally Relevant Computing' held at the Institute for Mathematics and Its Applications (IMA) at the University of Minnesota, April 11-15, 2010"--P. v. "ISSN: 0940-6573."
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Physical and Computational Issues in the Numerical Modeling of Ocean Circulation, R.L. Higdon -- Modeling Hazardous, Free-Surface Geophysical Flows with Depth-Averaged Hyperbolic Systems and Adaptive Numerical Methods, D.L. George -- Real-Time Forecasting and Visualization of Hurricane Waves and Storm Surge using SWAN+ADCIRC and FigureGen, J.C. Dietrich, C.N. Dawson, J.M. Proft, M. T. Howard, G. Wells, J.G. Fleming, R.A. Luetlich, Jr., J.J. Westerink, Z. Cobell, M. Vitse, H. Lander, B.O. Blanton, C.M. Szpilka, J.H. Atkinson -- Methane in Surbsurface: Mathematical Modeling and Computational Challenges, M. Peszynska -- Fast Algorithms for Bayesian Inversion, S. Ambikasaran, A. K. Saibaba, E.F. Darve and P.K. Kitanidis -- Modeling Spatial and Structural Uncertainty in the Subsurface , M. Gerritsen and J. Caers.
Sommario/riassunto	Computational Challenges in the Geosciences addresses a cross-

section of grand challenge problems arising in geoscience applications, including groundwater and petroleum reservoir simulation, hurricane storm surge, oceanography, volcanic eruptions and landslides, and tsunamis. Each of these applications gives rise to complex physical and mathematical models spanning multiple space-time scales, which can only be studied through computer simulation. The data required by the models is often highly uncertain, and the numerical solution of the models requires sophisticated algorithms which are mathematically accurate, computationally efficient and yet must preserve basic physical properties of the models. This volume summarizes current methodologies and future research challenges in this broad and important field. .
