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Nota di contenuto	FrontMatter -- Preface -- Contents -- ENGINEERING FOR EXTREME ENVIRONMENTS -- Introduction--Mary Kae Lockwood and John W. Weatherly -- Cool Robots: Scalable Mobile Robots for Instrument Network Deployment in Polar Climates--Laura R. Ray, Alexander D. Price, Alexander Streeter, Daniel Denton, and James H. Lever -- The Role of Modeling and Simulation in Extreme Engineering Projects--Jon Berkoe -- The Challenges of Landing on Mars--Tommaso P. Rivellini -- Accessing the Lunar Poles for Human Exploration Missions--B. Kent Joosten -- DESIGNER MATERIALS -- Introduction--Kristi S. Anseth and Diann E. Brei -- Thin-Film Active Materials--Greg P. Carman -- The Future of Engineering Materials: Multifunction for Performance-Tailored Structures--Leslie A. Momoda -- Biomimetic Strategies in Vascular Tissue Engineering--Jennifer L. West -- MULTISCALE MODELING -- Introduction--Grant S. Heffelfinger and Dimitrios Maroudas -- Equation-Free Modeling for Complex Systems--Ioannis G. Kevrekidis

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Sommario/riassunto

This volume includes 14 papers from the National Academy of Engineering's Tenth Annual U.S. Frontiers of Engineering Symposium held in September 2004. The U.S. Frontiers meeting brings together 100 outstanding engineers (ages 30-45) to learn from their peers and discuss leading-edge technologies in a range of fields. The 2004 symposium covered these four areas: engineering for extreme environments, designer materials, multiscale modeling, and engineering and entertainment. Papers in the book cover topics such as scalable mobile robots for deployment in polar climates, the challenges of landing on Mars, thin-film active materials, vascular tissue engineering, small-scale processes and large-scale simulations of the climate system, simulating physically accurate illumination in computer graphics, and designing socially intelligent robots, among others. Appendixes include information about the contributors, the symposium program, and a list of the meeting participants. The book is the tenth in a series covering the topics of the U.S. Frontiers of Engineering meetings.