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Nota di contenuto	Advanced Computational Infrastructures for Parallel and Distributed Adaptive Applications; Contents; Preface; ACKNOWLEDGMENTS; Contributors; Biographies; 1. Introduction: Enabling Large-Scale Computational Science-Motivations, Requirements, and Challenges; Part I Adaptive Applications in Science and Engineering; 2. Adaptive Mesh Refinement MHD Simulations of Tokamak Refueling; 3. Parallel Computing Engines for Subsurface Imaging Technologies; 4. Plane Wave Seismic Data: Parallel and Adaptive Strategies for Velocity Analysis and Imaging 5. Data-Directed Importance Sampling for Climate Model Parameter Uncertainty Estimation6. Adaptive Cartesian Methods for Modeling

Airborne Dispersion; 7. Parallel and Adaptive Simulation of Cardiac Fluid Dynamics; 8. Quantum Chromodynamics on the BlueGene/L Supercomputer; Part II Adaptive Computational Infrastructures; 9. The SCIJump Framework for Parallel and Distributed Scientific Computing; 10. Adaptive Computations in the Uintah Framework; 11. Managing Complexity in Massively Parallel, Adaptive, Multiphysics Finite Element Applications
12. GrACE: Grid Adaptive Computational Engine for Parallel Structured AMR Applications
13. Charm++ and AMPI: Adaptive Runtime Strategies via Migratable Objects; 14. The Seine Data Coupling Framework for Parallel Scientific Applications; Part III Dynamic Partitioning and Adaptive Runtime Management Frameworks; 15. Hypergraph-Based Dynamic Partitioning and Load Balancing; 16. Mesh Partitioning for Efficient Use of Distributed Systems; 17. Variable Partition Inertia: Graph Repartitioning and Load Balancing for Adaptive Meshes; 18. A Hybrid and Flexible Data Partitioner for Parallel SAMR
19. Flexible Distributed Mesh Data Structure for Parallel Adaptive Analysis
20. HRMS: Hybrid Runtime Management Strategies for Large-Scale Parallel Adaptive Applications; 21. Physics-Aware Optimization Method; 22. DistDLB: Improving Cosmology SAMR Simulations on Distributed Computing Systems Through Hierarchical Load Balancing;
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Sommario/riassunto

A unique investigation of the state of the art in design, architectures, and implementations of advanced computational infrastructures and the applications they support Emerging large-scale adaptive scientific and engineering applications are requiring an increasing amount of computing and storage resources to provide new insights into complex systems. Due to their runtime adaptivity, these applications exhibit complicated behaviors that are highly dynamic, heterogeneous, and unpredictable-and therefore require full-fledged computational infrastructure support for problem solving, run
