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| Descrizione fisica      | 1 online resource (592 p.)  |
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| Lingua di pubblicazione | Inglese   |
| Formato                 | Materiale a stampa  |
| Livello bibliografico   | Monografia  |
| Note generali           | Description based upon print version of record.   |
| Nota di bibliografia    | Includes bibliographical references at the end of each chapters and index.  |
| Nota di contenuto       | Criticality in Neural Systems; Contents; List of Contributors; Chapter 1 Introduction; 1.1 Criticality in Neural Systems; Chapter 2 Criticality in Cortex: Neuronal Avalanches and Coherence Potentials; 2.1 The Late Arrival of Critical Dynamics to the Study of Cortex Function; 2.1.1 Studying Critical Dynamics through Local Perturbations; 2.1.2 Principles in Cortex Design that Support Critical Neuronal Cascades; 2.2 Cortical Resting Activity Organizes as Neuronal Avalanches; 2.2.1 Unbiased Concatenation of Neuronal Activity into Spatiotemporal Patterns 2.2.2 The Power Law in Avalanche Sizes with Slope of -3/22.2.3 Neuronal Avalanches are Specific to Superficial Layers of Cortex; 2.2.4 The Linking of Avalanche Size to Critical Branching; 2.3 Neuronal Avalanches: Cascades of Cascades; 2.4 The Statistics of Neuronal Avalanches and Earthquakes; 2.5 Neuronal Avalanches and Cortical Oscillations; 2.6 Neuronal Avalanches Optimize Numerous Network Functions; 2.7 The Coherence Potential: Threshold-Dependent Spread of Synchrony with High Fidelity; 2.8 The Functional Architecture of |

Neuronal Avalanches and Coherence Potentials; Acknowledgement  
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3.2 What is Criticality Good for?; 3.2.1 Emergence; 3.2.2 Spontaneous  
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3.3 Statistical Signatures of Critical Dynamics; 3.3.1 Hunting for Power  
Laws in Densities Functions; 3.3.2 Beyond Fitting: Variance and  
Correlation Scaling of BrainNoise; 3.3.2.1 Anomalous Scaling; 3.3.2.2  
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Dynamics at Criticality  
3.4.1 fMRI as a Point Process3.4.2 A Phase Transition; 3.4.3 Variability  
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Floods, and Fuzzy Paths; 3.6 Summary and Outlook; References;  
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Biological Coordination; 4.4 Beyond Analogy; 4.5 An Elementary  
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4.6 Theoretical Modeling: Symmetry and Phase Transitions4.7 Predicted  
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Nonequilibrium Phase Transitions in the Human Brain: MEG, EEG, and  
fMRI; 4.11 Neural Field Modeling of Multiple States and Phase  
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Spatiotemporal Metastability  
4.13 The Middle Way: Mesoscopic Protectorates

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### Sommario/riassunto

Leading authorities in the field review current knowledge of critical behavior in brain function, both experimental and theoretical. The book begins by summarizing experimental evidence for self-organized criticality in the brain. Subsequently, recent breakthroughs in modeling of neuronal circuits to establish self-organized criticality are described. Finally, the importance of critical dynamics for brain function is highlighted.

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