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Titolo	Anomalous Diffusion [[electronic resource]] : From Basics to Applications // edited by Andrzej Pekalski, Katarzyna Sznajd-Weron
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Collana	Lecture Notes in Physics, , 0075-8450 ; ; 519
Disciplina	530.4/75
Soggetti	Gravitation Physics Condensed matter Classical and Quantum Gravitation, Relativity Theory Mathematical Methods in Physics Numerical and Computational Physics, Simulation Condensed Matter Physics
Lingua di pubblicazione	Inglese
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Nota di contenuto	Coherent spatio-temporal coupling in fractional wanderings. Renewed approach to continuous-time Lévy flights -- Lévy flights and Lévy walks revisited -- Mean first-passage times and hopping mobility of particles under bias in nonsymmetric potentials -- Coherent quasi-elastic neutron scattering from lattice gases and its relationship to fick' s law of diffusion -- Random flights with quenched noise amplitudes -- On fractional diffusion and its relation with continuous time random walks -- Anomalous diffusion in disordered lattices: Effect of bias -- Aspects of the noisy burgers equation -- Anomalous diffusion of polymers in supercooled melts near the glass transition -- Intermittent dynamics and aging in glassy systems -- Macroscopic finite size effects in relaxational processes -- Diagnosis using photon diffusion: From brain oxygenation to the fat of the atlantic salmon -- Stochastic modelling of ion diffusion in complex systems -- Dispersion in freely decaying and forced 2D turbulence -- Fluctuations and their correlations in econophysics -- Fronts and pattern formation in

reaction-diffusion systems -- Entanglement effects in model polymer networks -- Models of cooperative diffusion -- Hydrogen diffusion in proton conducting oxides and in nanocrystalline metals -- Shape and selfsimilarity of diffusion-limited aggregation clusters -- Random walks, fractons, and electrons on percolation structures at criticality -- From microscopic kinetics to generalized allen-cahn equations. Application to adatoms and intercalation dynamics -- Diffusive and subdiffusive step dynamics -- Equilibrium versus non-equilibrium surface diffusion measurements -- Classical diffusion in presence of geometrical constraints and/or interactions -- Diffusion of adsorbed particles on surfaces with channeled atomic corrugation -- Instabilities and transport properties in sheared granular gases -- Avalanches of dry sand -- Anomalous diffusion: Summary.

Sommario/riassunto

This collection of articles gives a nice overview of the fast growing field of diffusion and transport. The area of non-Browman statistical mechanics has many extensions into other fields like biology, ecology, geophysics etc. These tutorial lectures address e.g. Lévy flights and walks, diffusion on metal surfaces or in superconductors, classical diffusion, biased and anomalous diffusion, chemical reaction diffusion, aging in glassy systems, diffusion in soft matter and in nonsymmetric potentials, and also new problems like diffusive processes in econophysics and in biology.
