

DEPARTMENTAL
COLLOQUIUM

DYNAMICAL MODELS FOR
SUPERDIFFUSION
AND SUPERCONDUCTIVITY

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Abstract: *Electrical current is modeled by a periodic Lorentz gas under an external field. One can also picture this as a pinball machine or a Galton board. Depending on the size and positions of the pins (heavy molecules) the resulting current may be normal (satisfying Ohm's law and the Einstein relation) or ballistic (exhibiting superconductivity). Most of the facts were first observed by physicists in computer experiments and recently proven rigorously by mathematicians. A few facts, though, were first discovered mathematically and then verified experimentally.*