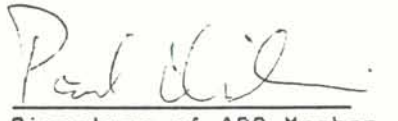
Abstract submitted
for the March 1986 Meeting of the
American Physical Society
31 March -4 April 1986 Sorting Catagory

22a

Flux Quantization in Quasiperiodic and Non-Periodic Networks. A. Behrooz+, M. Burns+*, P. M. Chaikin+* and H. Deckman*, +Univ. of Penn., *Harvard Univ., *Exxon Research -- Using microlithographic techniques, both optical and electron beam (at the National Submicron Facility, Cornell), we have fabricated a series of patterns of 500 Angstrom thick Aluminum for studies of flux quantization in periodic, almost periodic, random and fractal structures. "One dimensional" patterns have a periodic set of horizontal lines and periodic, quasiperiodic (two irrational periods), quasicrystalline (Fibonacci), randomly placed rectangles in the golden mean ratio, random and Fractal (Cantor set) spaced lines vertically. Two dimensional patterns include five fold Penrose tiles and eight-fold quasicrystals. The transition temperature vs. magnetic field yields a spectrum showing both the rationality or irrationality of the elementary areas at fields exceeding a single flux quantum and fine structure at small fields indicating the presence or absence of coherent interference.
Research supported by NSF DMR 83-18060 and the Laboratory for Research on the Structure of Matter, Penn.



Signature of APS Member

Paul M. Chaikin

Department of Physics
University of Pennsylvania
Phila. PA, 19104