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FPU, Solitons and Nonlinear Science: History, Visiometrics and Art & Science

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I review how the discipline of "nonlinear" physics arose from the '54-'55 Fermi-Pasta-Ulam (FPU) digital computer simulations of the nonlinear one-dimensional alpha-lattice and the discovery of the soliton (1965) and "n-curve" states (1967). Recently, applications to accelerated inhomogeneous (Richtmyer-Meshkov) flows have been made and evolving vortex bilayers and "vortex projectiles" discovered in the emerging turbulence. Underlying these innovations is the cogent visiometrics approach, whose representations can provide peak insights that lead to pathways for discovery and can stimulate artistic expression. See (http://www.mechanical.rutgers.edu/scart4/ especially "Links"); also, " FPU, solitons & the fabric of nonlinear science: History, synergetics and visiometrics" in CHAOS (to be published in '05).-