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Novel Dynamics of One-Way Coupling

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Arrays of two-way coupled oscillators are familiar and have been extensively studied. However, arrays of one-way coupled oscillators have been studied only recently. One-way coupling seems impossible, because it appears to violate Newton's third law (and energy conservation).However, such arrays can be realized by enabling each oscillator to modify an external force that does work on a neighboring oscillator. The resulting arrays exhibit fascinating behavior of topological origin, such as the creation and annihilation of solitons.In this talk, I will describe theory, simulations, and experiments involving noisy one-way coupled oscillators.