1085-78-206 **Frank W Wise*** (frank.wise@cornell.edu), Department of Applied Physics, Cornell University, Ithaca, NY 14850, **Nathan Kutz** (kutz@amath.washington.edu), Department of Applied Mathematics, University of Washington, Seattle, WA , and **William Renninger**, Department of Applied Physics, Cornell University, Ithaca, NY 14850. *High-Performance Femtosecond Fiber Lasers Based on Dissipative Processes.*

The femtosecond lasers that underlie ultrafast science and technology are based on solitons — pulses that balance anomalous dispersion and nonlinearity. Solitons offer attractive features, but their energy is limited, and this limitation is particularly challenging in fiber lasers. As a consequence, short-pulse fiber lasers have not been competitive with solid-state lasers. Recently, a new class of pulses that form with only normal dispersion has been identified. These are referred to as dissipative solitons. Short-pulse fiber lasers based on them generate pulses with 10-100 times the energy of prior fiber lasers, and much-higher energies may be possible. Theoretical and experimental results on dissipative-soliton lasers will be presented. Important discrepancies between numerical simulations and experimental results will be highlighted. (Received September 10, 2012)