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Paul M. N. Feehan* (paul.feehan@rutgers.edu), Department of Mathematics, Rutgers University, 110 Frelinghuysen Road, Piscataway, NY 08854-8019, and **Manos Maridakis** (manousos.maridakis@rutgers.edu), Department of Mathematics, Rutgers University, 110 Frelinghuysen Road, Piscataway, NJ 08854-8019. *The Lojasiewicz-Simon gradient inequality and its applications to differential geometry, topology, and mathematical physics.*

The Lojasiewicz-Simon gradient inequality is a generalization, due to Leon Simon (1983), to analytic or Morse-Bott functionals on Banach manifolds of the finite-dimensional gradient inequality, due to Stanislaw Lojasiewicz (1963), for analytic functions on Euclidean space. In this talk, we shall discuss several generalizations of the Lojasiewicz-Simon gradient inequality and a selection of their applications, including global existence and convergence of Yang-Mills gradient flow over 4-manifolds, discreteness of energies of Yang-Mills connections over 4-manifolds, and discreteness of energies of harmonic maps from Riemann surfaces into analytic Riemannian manifolds. (Received January 19, 2016)