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Degenerate and singular phenomena in nonlinear elliptic equations

Abstract. This talk is based on several recent personal results on various singular or degenerate phenomena arising in some nonlinear elliptic equations inspired by concrete models in mathematical physics. We are concerned with the asymptotic behaviour of solutions and we establish several existence or nonexistence results for associated bifurcation problems. A novelty is the use of the Karamata regular variation theory in the qualitative analysis of nonlinear elliptic equations. Some open problems are also raised, in connection with previous results of Brezis and Vazquez.