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*Second order conformally invariant elliptic equations*

**Abstract**

We will give an introduction to a fully nonlinear version of the Yamabe problem and the state-of-the-art of the existence and compactness of solutions for the problem. The emphasis will be on the analytical issues arising from the study of the problem. Efforts will be made to make the minicourse accessible to graduate students. The material included will be on the following topics for conformally invariant elliptic or degenerate elliptic equations of second order: Liouville theorems, symmetry results, comparision theorems, local first and second derivative estimates, Harnack type inequality, Bocher type theorem, analysis of profile of blow-up solutions, higher regularity of continuous viscosity solutions.