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Wave Maps

ABSTRACT:

Wave maps are one of the fundamental geometric wave equations, being on the one hand the dynamic analogue of harmonic maps, and a simplified model for the Einstein equations and gauge field theories such as the Yang-Mills equations on the other. In recent years there has been substantial progress in understanding basic questions such as global regularity and singularity formation for this equation, using new tools such as the induction-on-energy strategy of Bourgain, the concentration-compactness technology of Kenig and Merle, a geometric gauge fixing arising from the harmonic map heat flow, and even some limiting arguments used by Perelman in his proof of the Poincare conjecture. We will survey some of these developments in this talk.