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The Geometry of Ricci Curvature

We discuss recent advances in the understanding of the structure of spaces with lower and bounded Ricci curvature. After a brief review we will explain the resolution of the constant dimension conjecture for collapsed spaces with lower Ricci curvature, and we will outline new theorems on the regularity of Einstein manifolds. In the converse direction we will discuss new examples which show how such spaces can be wildly degenerate. At the end we will briefly mention how some of the ideas are quite general and can be used to provide new and sharp regularity results in a wide number of areas in analysis and geometry, in particular for minimizing hypersurfaces and harmonic maps between Riemannian manifolds.