Metric Diophantine approximation on manifolds

The talk deals with the metric theory of Diophantine approximation, particularly on manifolds. The basic object of study in Diophantine approximation is rational approximation to irrational real numbers. A well-known, most basic standard result due to Dirichlet is that for all irrational ζ the inequality $|\zeta - p/q| \leq q^{-2}$ has infinitely many rational solutions p/q. Equivalently one can say any irrational number is approximable to degree at least two by rational numbers. Since the theory of approximation to a single number is basically well-understood by the theory of continued fractions, nowadays simultaneous approximation to a finite set of numbers $\zeta_1, \ldots, \zeta_k$ is the central point of study. Thanks to Jarník the metric theory of (simultaneous) approximation, by which we mean to determine the Hausdorff dimension of the points in $\mathbb{R}^k$ approximable to some given degree, is understood. However, similar questions can be asked when restricting to certain submanifolds of $\mathbb{R}^k$, and the situation turns out to be more difficult. After a basic introduction to Diophantine approximation, the main focus of the talk is to present known results on the metric theory of Diophantine approximation on manifolds, mostly without proofs (maybe a sketch of one or two proof ideas may be presented). Some results concerning the closely related topic of approximation of linear forms will be displayed as well.