Balazs Csikos (Eotvos Lorand University, Budapest, Hungary)
Extendability of the Kneser-Poulsen Conjecture to Riemannian Manifolds

`Abstract:` The Kneser-Poulsen conjecture (still open in dimensions ≥ 3) claims that if $P_1, \ldots, P_N$ and $Q_1, \ldots, Q_N$ are points in the Euclidean space, such that $d(P_i, P_j) \geq d(Q_i, Q_j)$ for all $1 \leq i \leq j \leq N$, and $r_1, \ldots, r_N$ are given positive numbers, then the volume of the union of the balls $B(P_i, r_i)$, $i = 1, \ldots, N$ is not less than the volume of the union $\bigcup_{i=1}^N B(Q_i, r_i)$.

In this talk, we study the question what class of Riemannian manifolds the conjecture can be extended to. First we overview some volume variation formulae, in particular a Schläfli-type formula in Einstein manifolds, which enable us to prove special cases of the conjecture not only in the Euclidean, but also in the hyperbolic and spherical spaces. These results give hope that the conjecture will turn out to be true in these spaces as well. Secondly, we prove that if M is a complete connected Riemannian manifold, in which the Kneser-Poulsen conjecture holds, then M is a simply connected space of constant curvature.