In this talk, we report a joint result with Professor Mei-Chi Shaw on the Cheeger-Gromoll soul conjecture.

Let M be a complete, non-compact Riemannian manifold with nonnegative sectional curvature. We derive a new broken flat strip theorem associated with the Cheeger-Gromoll convex exhaustion, in the case when M is not diffeomorphic to the n-dimensional Euclidean space. This leads to a new proof of the Cheeger-Gromoll soul conjecture without using Perelman's flat strip theorem.

Using the Cheeger-Gromoll's inward equidistant evolution and the Calabi's barrier surface technique, we also provide a new proof of the Takeuchi Theorem in Kahler geometry.