The Union problem

It is well known that the increacing union $\cup_{n=1}^{\infty}\Omega_i$ of pseudoconvex domains in $\mathbb{C}^n$ is also pseudoconvex. Analogous statement for manifolds i.e. that increasing union of Stein open subsets of a Stein manifold is Stein is also known but the proof involves deep results such as the Docquier-Grauert retraction theorem. On the other hand the problem for Stein open subsets of a Stein space with singularities (known as the union problem) stays open for a long time.

The goal ot the talk was to recall the basic notions related to Steinness and to present the classical example of Fornaess that increasing union of Stein manifolds need not be Stein.