

# Rigidity in $R^3$

Dušan Repovš

Institute for Mathematics, Physics and Mechanics  
Jadranska 19, P.O.Box 2965  
University of Ljubljana  
Ljubljana, Slovenia 1001  
Email address: [dusan.repovs@uni-lj.si](mailto:dusan.repovs@uni-lj.si)  
Homepage: <http://pef.pef.uni-lj.si/repovs/>

We say that a subset  $A \subset X$  is *rigid* in  $X$  if for any homeomorphism  $f: X \rightarrow X$ , such that  $f(A) = A$  we have  $f|_A = id_A$ . In the first part of the talk we shall give a survey of known examples of rigid sets in  $R^3$ .

Among them are also wild Cantor sets. Heretofore it was unknown if such examples which also have simply connected complement can be constructed. Moreover, previous constructions of wild Cantor sets in  $R^3$  with simply connected complement, in particular the Bing-Whitehead Cantor sets, had strong homogeneity properties. This suggested it might not be possible to construct such sets that were rigid.

In the second part of the talk we shall present a new result (joint work with D.J. Garity and M. Željko) that in fact uncountably many topologically distinct examples exist (Cantor sets  $X, Y \subset R^3$  are said to be *topologically distinct* or *inequivalent* if there is no homeomorphism of  $R^3$  to itself taking  $X$  to  $Y$ ).