MIKHAIL BOUNIAEV, The University of Texas Rio Grande Valley
On the Concept of t-bonded Sets

One of the properties of the (r, R)-systems, or Delone sets, is that any two points of a Delone set can be connected by a broken line, with distances between two consecutive vertices bounded by 2R. This property plays an important role in proving theorems of the local theory for regular and multi-regular systems. We will show that similar results obtained for the local theory in the assumption that the set is a Delone set, could be proved for the sets we call t-bonded sets, i.e., for uniformly discrete subsets of Euclidian space, which hold a property that is a generalization of the property of the Delone sets mentioned above. Though similar results can be obtained for t-bonded sets, as far as the local theory is concerned, the class of t-bonded sets is a significant extension of the class of Delone sets as it includes all finite sets, t-bonded sets with bounded projections onto subspaces of initial Euclidian space, and other sets that are not Delone sets. The local theory for t-bonded sets deserves to be developed to describe various materials like zeolites whose atomic structure is a multi-regular "microporous" point set, or the structural type of Niobium Oxide. Results presented in the talk have been recently achieved through joint collaboration with Nikolay Dolbilin, who initially introduced the concept of the t-bonded sets in 1976 under the name of d-connected sets though it did not receive due consideration at that time.