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Some important properties of Grigorchuk's group. Preliminary report.

In 1980 R. Grigorchuk introduced a group which is now known as “Grigorchuk’s group.” It is an important object in the field of geometric group theory, particularly in the study of branch groups and self-similar groups. Its properties have helped resolve several long-standing open problems. In 1984, Grigorchuk proved that his group is an example of a group with “growth” that is intermediate, faster than polynomial but slower than exponential, thus providing an answer to an open question posed by John Milnor in 1968. Grigorchuk’s group is also the first example of a finitely generated group that is amenable but not elementary amenable, providing an answer to another long-standing problem posed by Mahlon Day. In our talk we give a brief history of this famous group, introduce some of its fascinating properties and discuss recent research. (Received August 29, 2014)