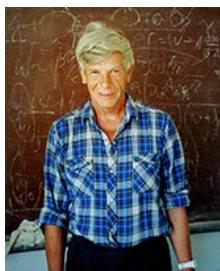


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How to construct a symmetric surface?

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The main subject of study in the general relativity and other branches of science is the geometry of (pseudo)-Riemannian spaces defined by a metric. To better imagine and understand the properties of a particular spacetime, it is often useful to define a surface in some ambient space that has such a metric - in other words, to construct an isometric embedding. However, the search for an explicit form of such surfaces turns out to be a very nontrivial problem of solving a system of nonlinear PDEs. Fortunately, this problem is greatly simplified if the spacetime under study has sufficiently rich symmetry (which is the case for many physically interesting spacetimes). This talk is devoted to a method of construction of surfaces with a given metric, which based on a group-theoretic analysis of the symmetries of this metric. Several examples of its application will be discussed (Friedmann and Godel universes, rotating black holes etc.) along with its possible generalizations.

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