The Poincare conjecture and a geometric model of "black hole".

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Let M^n be a compact, closed, smooth manifold. Then there exists a Riemannian metric g on M^n and a smooth triangulation of M^n. Both the structures make possible to prove the following

Theorem 1. *The manifold* M^n *has a decomposition* $M^n = C^n \bigcup K^{n-1}, C^n \bigcap K^{n-1} = \emptyset$, *where* C^n *is a* $n-$ *dimensional cell and* K^{n-1} *is a connected union of some* $(n-1)$ *simplexes of the triangulation.*

K^{n-1} is called a *spine* of M^n.

Using the theorem 1 we have obtained

Theorem 2. (Poincare). *Let* M^3 *be a compact, closed, smooth simply connected manifold of dimension* 3. *Then* M^3 *is diffeomorphic to* S^3, *where* S^3 *is the sphere of dimension* 3.

For any point $z \in K^{n-1}$ we can consider the closed geodesic ball $\overline{B}\,(z, \varepsilon)$ of a small radius $\varepsilon > 0$. A set $Tb(K^{n-1}) = \bigcup\limits_{z \in K^{n-1}} \overline{B}(z, \varepsilon)$ is called "*black hole*". It is clear that $M^n \setminus Tb(K^{n-1})$ is a cell for some small ε.

Theorem 3. *Let* Φ *be a pseudoriemannian metric on* M^n. *Then there exists a deformation* $\overline{\Phi}$ *of* Φ *on* M *with the following properties.*

a) $\overline{\Phi}$ *is continuous and sectionally smooth.*

b) *If a point* $x \in M^n \setminus Tb(K^{n-1})$ *and* $\overline{\Phi}$ *is smooth at the point* x , *then the curvature tensor* $\overline{R}_x$ *of* $\overline{\Phi}$ *vanishes. In other words, all the curvature of* $\overline{\Phi}$ *is concentrated in* $Tb(K^{n-1})$.