



Contribution ID: 641

Type: **Invited talk in a parallel session**

A New Structure of Black Holes

Monday, 8 July 2024 15:00 (30 minutes)

We reveal a new structure of black holes previously unexplored in the 20th Century. A black hole with an angular momentum and an angular velocity has a moment of inertia. It is a hidden property of the Kerr metric. When the rotation stops in an energy extraction process, there is an irreducible moment of inertia due to the irreducible mass of a Kerr black hole. The moment of inertia indicates physical structure. The Kerr black hole has an extended structure with a radius of gyration lying outside the horizon. In the static limit, the moment of inertia of a Schwarzschild-like black hole is exactly: $\text{mass} \times (\text{Schwarzschild radius})^2$. This surprising result excludes the singularity of a Schwarzschild black hole, thereby removing the various paradoxes associated with the mathematical black hole.

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Session Classification: Repetitive Penrose process