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## **This Black Hole Fact Will Jump off the Page**

An interview with **Marcel Franz**, Professor, UBC Physics & Astronomy  
Deputy Director, Stewart Blusson Quantum Matter Institute

Graphene is an atomically thin single sheet of carbon atoms that actually exists when you draw something with a pencil; in the debris field of your drawing, there's little pieces of graphene. Now, a great breakthrough has been done about ten years ago when scientists discovered how to isolate a single piece of this graphene. And you can make observations on a single atomic sheet of carbon atoms, and it has some wonderful properties that, believe it or not, relate to the physics of black holes, and possibly wormholes.

### **How does this connection work?**

Black holes are these enigmatic objects that have some very interesting properties when you try to think about them as both relativistic objects and quantum mechanical objects. Believe it or not, there are very clear parallels in physics between physics of black holes and what happens in a small flake of graphene. It comes down to mathematical description. The two are described by basically the same mathematical equations that you can write down on paper, and one can learn from the physics of black holes about graphene, and vice versa.

There's no conceivable experiment that we can think of that would probe the physics of a black hole from up close. It's amazing that you can answer some of the questions that pertain to the physics of black holes by studying a flake of graphene or some other similar material in the lab, which can be done in this building.