

# On winning Inaugural prize from the American Mathematical Society, for research on black holes

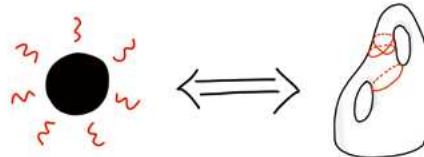
Hirosi Ooguri Principal Investigator of IPMU

Black holes have been important sources of inspiration in our quest toward unification of general relativity and quantum mechanics. I am grateful for the recognition by the American Mathematical Society, which encourages our endeavor to discover fundamental laws of nature and to understand the universe by the synergy of mathematics and physics.



ストリング理論で

ブラックホールの熱の正体 と 6次元の幾何学が



結びつけられた。

Black hole thermodynamics and 6-dimensional geometry are related by string theory.

$$\sum_g \mathcal{N}(p, g) e^{g \cdot \phi} = \left| \exp \left( \sum_{g, m} F_{g, m} \lambda^{2-2g} e^{-m \cdot \phi} \right) \right|^2$$

$\uparrow$   
 ブラックホールの状態数

$\uparrow$   
 グロモフ・ウィッテン不変量

ここで  $p + i\phi = (\lambda, \lambda\phi)$

The Ooguri-Strominger-Vafa formula relates the number of quantum states of a black hole (on the left-hand side) to the Gromov-Witten invariants of a Calabi-Yau manifold (on the right-hand side).