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# 国台学术报告 NAOC COLLOQUIUM

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**Time: Wednesday 2:30 PM, Apr. 09 Location: A601 NAOC**

## Correlation, entropy and the information loss paradox

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Dr. Qingyu Cai is a professor at Wuhan Institute of Physics, CAS. He obtained his PhD in Physics from Wuhan Institute of Physics and Mathematics, CAS in 2004, and was an Associate professor at Wuhan Institute of Physics, CAS from 2004 to 2009. He has been a Professor from 2009. He won the First prize in the 2013 Essay Competition of the Gravity Research Foundation. His current research interests include quantum theory and application.

### Abstract

In both classical and quantum world, information cannot appear or disappear. This fundamental principle, however, is questioned for a black hole, by the acclaimed “information loss paradox”. Based on the conservation laws of energy, charge, and angular momentum, we recently show the total information encoded in the correlations among Hawking radiations equals exactly to the same amount previously considered lost, assuming the non-thermal spectrum of Parikh and Wilczek. Thus the information loss paradox can be falsified through experiments by detecting correlations, for instance, through measuring the covariances of Hawking radiations from black holes, such as the manmade ones speculated to appear in LHC experiments. The affirmation of information conservation in Hawking radiation will shine new light on the unification of gravity with quantum mechanics.



*All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.*