

How to recover your homework from a black hole

Saturday, June 17, 2023 2:30 PM (30 minutes)

Alice is taking a course on QFT in curved spacetime, and accidentally drops her midterm into a black hole. From Hawking's famous calculation, she suspects the midterm been irreversibly thermalized, and her GPA with it. Her colleague Bob, a card-carrying unitarian, believes the midterm can be recovered from the Hawking radiation, at least in principle. Their mutual friend Charlotte is a condensed matter theorist who constructed the black hole, using matter entangled with her quantum computer, for a harebrained DARPA project. We discuss how Charlotte can recover Alice's midterm, proving Bob right and saving Alice's GPA, provided Charlotte's quantum computer is embedded into an asymptotically large Dyson sphere tuned to a critical state.

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Session Classification: String and Quantum Gravity

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