

Performing thought experiments to improve our theories for fundamental physical phenomena

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Today's theories for fundamental phenomena, such as the Standard Model of the Subatomic particles, agree with laboratory tests under the most extreme conditions that could be realised. Yet we know that these theories have shortcomings, such that predictions for the outcomes of far more extreme experiments will be ambiguous. A notorious example is the microscopic black hole. All black holes can become microscopic if surrounded by a high vacuum for ultra cosmological periods of time. We now demand our theories to predict their quantum behaviour. Such demands may yield new constraints and new mathematical principles, essential for further progress.