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Matt Visser, Black holes in general relativity

Do black holes “exist” ?

“This innocent question is more subtle than one might expect, and the answer depends very much on whether one is thinking as an observational astronomer, a classical general relativist, or a theoretical physicist.”

Astronomers have certainly seen things that are small, dark, and heavy.

Classical general relativist:

Eternal black holes certainly exist mathematically.

Theoretical physicist:

We have not seen direct observational evidence of the event horizon.

**The mathematical solutions suffer
essential physical shortcomings !**

Visser M, Barcelo C, Liberati S, Sonego S: gr-qc/0902.0346

Small, dark, and heavy: But is it a black hole?