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## Bob in Rindler space

19 November 2005 by Michael Duff, London, UK  
Magazine issue 2526. [Subscribe and save](#)

In response to Chris Robbins's question about Rindler space and the equivalence principle, you say that from a windowless box "Bob would not be able to tell whether he was accelerating in Rindler space or in the presence of a black hole" (22 October, p 27). Unfortunately, this is incorrect.

Although Rindler space and a black hole both exhibit event horizons, they are in other respects very different. In Rindler space, the gravitational field is uniform, space-time is flat, and the equivalence principle holds globally. For a black hole, the gravitational field is non-uniform, space-time is curved, and the equivalence principle holds only locally. Consequently, Bob would be able to tell the difference by dropping an object from his left hand and one from his right. In the presence of a black hole, the two objects would be seen to move slightly closer together as they both fall towards the centre of the black hole. In Rindler space their trajectories would remain parallel.

From Pete Wiggins

Am I alone in becoming somewhat irritated by your continued employment of Alice and Bob in your thought experiments? It is surely time that my friends Xavier and Yolanda were given a fair crack of the quantum whip, to say nothing of Zoe, who may sometimes be a complex character but is frequently their equal.

Stroud, Gloucestershire, UK

Imperial College London



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