Don Marolf
Firewall panel policy Statement

In a generic black hole* microstate (or ensemble thereof)

- The usual semi-classical `approximation' will break down i) at macroscopic distances outside the black hole and/or ii) for infalling observers crossing the horizon.
- Either effect will be large.
- For (ii), the strength of the effect makes it unlikely that a human could survive the passage across even the largest old black holes. (`Firewall.')
- `Young' black holes just formed from collapse are not in generic states. But they become so no later than the Page time (R^3/ℓ_p in 4d), and perhaps as early as the scrambling time (R ln R). The latter is quite short for astrophysical black holes. So option (ii) might be testable using gravity wave observatories.

* I assume the black hole has only a single asymptotic region.

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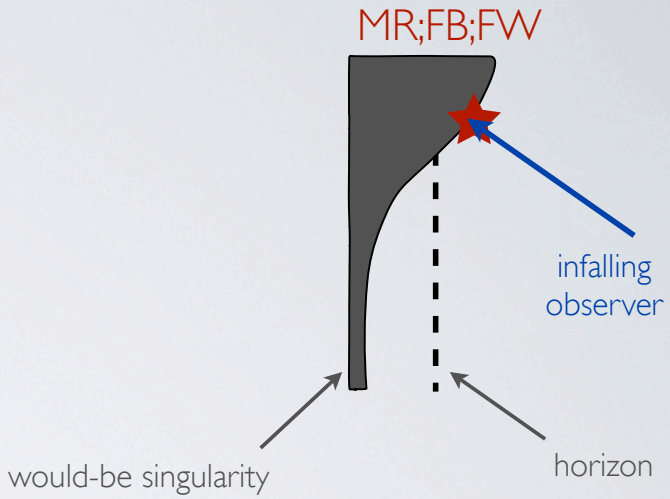
(though geometry may not be the correct fundamental description ...)

2) There are logically distinct scenarios:

(shown in Eddington-Finkelstein picture)

a) massive remnant/fuzzball/firewall



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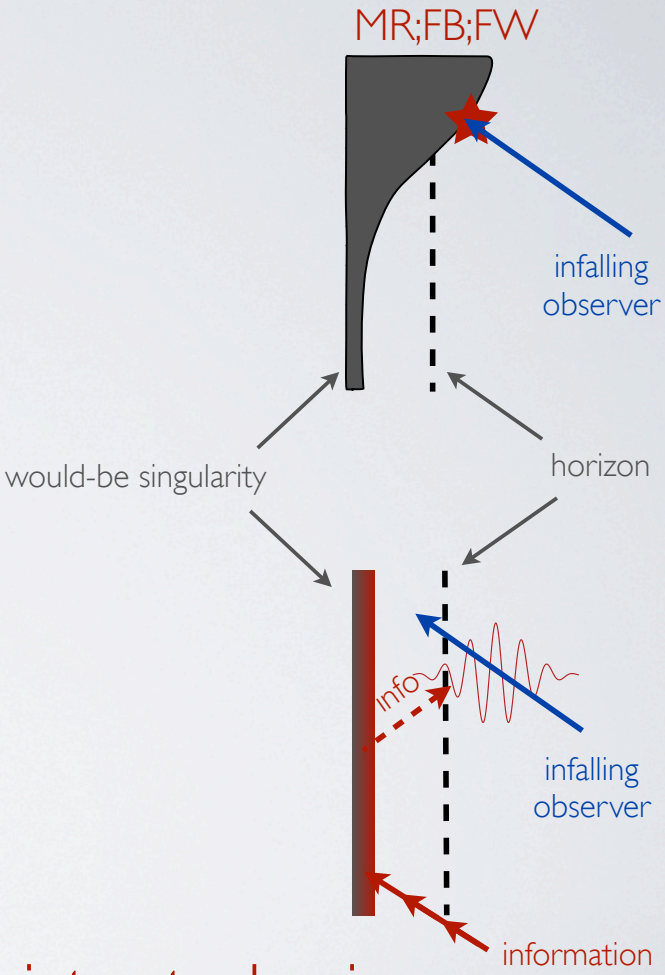
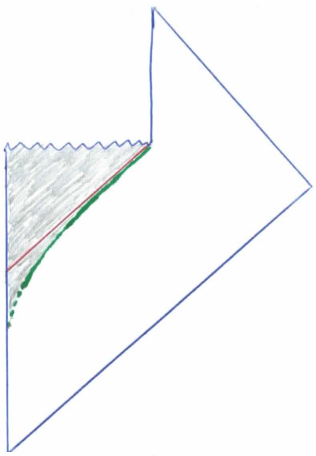


b) nonviolent nonlocality

(if consistent, more conservative?)

3) It is worth understanding what consistent physics can describe the latter (a guide to mechanics?)

Black hole complementarity



BHC postulates refer to observations made outside black hole.

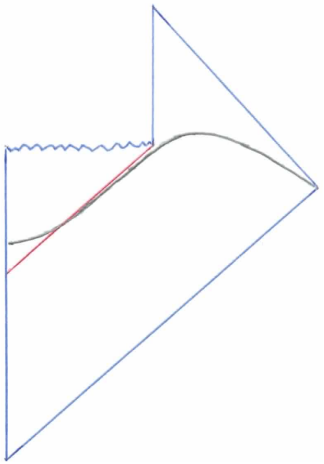
L. Susskind, L.T., J. Uglum '93

Semi-classical effective field theory applies to region outside stretched horizon.

Black hole region represented by d.o.f.'s on stretched horizon.

BHC vs. firewall depends on the stretched horizon dynamics.

D. Lowe, K. Larjo, L.T. in preparation



Effective field theory for infalling observer requires "nice slices" that avoid the region of strong curvature near black hole singularity.

Local extrinsic curvature of a nice slice is small everywhere
Global properties are not so nice.

Enormous relative boost between inside and outside of black hole. Gravitational back-reaction leads to a breakdown of local effective field theory when the relative boost gets large.

S. Giddings and M. Lippert '04; D. Lowe, L.T. '06