

# **On the Fate of Alternative Gravitation and Extra Dimensional Theories**

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## *Abstract*

The object of this (exceedingly) brief note is to point out that the recent discovery of gravitational waves may further constrain brane-worlds models and alternative theories of gravitation.

*“Sic transit gloria mundi”*

There are several mainstream theories that are likely to be impacted by the recent discovery of gravitational waves. At least so far, the physics community, while focusing on the detection results and the future of gravitational wave astronomy, has been silent on how the LIGO discovery may link to high-energy theory. The main models to be further constrained (or re-evaluated) in the short-term are:

- 1) The original Kaluza-Klein model and its derivatives [1-3],
- 2) The Randall-Sundrum scenario of warped extra-dimensions [4],
- 3) The ADD model of large extra-dimensions [5],
- 4) Some alternatives theories on classical gravitation [6-7].

It is also reasonable to presume, in our opinion, that other models will be critically re-examined in the long-term. Among them, the AdS/CFT correspondence [8], as well as dimensional reduction in the far ultraviolet regime of field theory [9].

## **References:**

- 1) <http://www.weylmann.com/kaluza.pdf>
- 2) <http://arxiv.org/pdf/gr-qc/9805018v1.pdf>
- 3) <http://www.thp.uni-koeln.de/gravitation/courses/WS10/Kaluza-Klein.pdf>
- 4) <http://arxiv.org/pdf/hep-ph/9905221v1.pdf>
- 5) <http://arxiv.org/pdf/hep-ph/9803315v1.pdf>
- 6) <http://hep.physics.uoc.gr/cosmo10/talks/Modified%20Gravity%20Davis.pdf>
- 7) [https://en.wikipedia.org/wiki/Alternatives\\_to\\_general\\_relativity](https://en.wikipedia.org/wiki/Alternatives_to_general_relativity)
- 8) <http://arxiv.org/pdf/1310.4319v3.pdf>
- 9) <http://arxiv.org/pdf/1405.3297v2.pdf>