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## Soap-bubble of the Universe: the theory and the eye

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After introducing the standard model of cosmology and its fundamental pillars, I will discuss its successes and problems. Based on these I will analyze the fundamental assumptions of the underlying model and how one can consistently try to extend/generalize them.

I will then discuss how we can use cosmological and astrophysical observations to test gravity and our fundamental assumptions, with a special emphasis on gravitational waves measurements and the future ahead.

