

## What is new in gravity?

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# Quantum Critical Membranes and Gravity

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I will review the challenges of quantizing supermembranes and the proposal of quantum critical membrane as a candidate high-energy completion. Quantum critical membranes are described by a renormalizable worldvolume theory exhibiting anisotropy in the worldvolume space and time. I will discuss the quantization of a three-dimensional Lifshitz sigma model associated with the matter sector of quantum critical supermembranes and the bimetric nature of the target-space geometry. I will also comment on how to couple such sigma models to dynamical worldvolume quantum (super)gravity.

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