Asymptotic safety of gravity-matter systems

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Functional Renormalization Group methods

- Asymptotic Safety in Quantum Gravity
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• Wetterich equation:

$$\Gamma_k = \frac{1}{2} \operatorname{Tr} \left[\left(\Gamma_k^{(2)} + R_k \right)^{-1} \partial_t R_k \right] \tag{1}$$

• Graphical representation as one-loop equation:

$$\partial_t \bigcirc = \frac{1}{2} \bigcirc$$

Analyzing Gravity-Matter systems

• Truncation [3]

$$\Gamma_k = \Gamma_{\rm EH} + \mathcal{S}_{\rm gf} + \mathcal{S}_{\rm gh} + \Gamma_{\rm matter}$$
 (2)

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