

Quantum Black Holes: some basic questions

- ▶ What does “quantizing the Schwarzschild solution” reveal?
- ▶ What does effective dynamics with/without matter reveal? (BH-WH transition, shock wave, ... ?)
- ▶ Classical gravitational collapse of a scalar field in spherical symmetry is well-understood (Choptuik):
 - “weak” data: no BH, just scattering;
 - “strong” data: BH;
 - the transition between the two is a fine-tuned naked singularity.

What is the quantum theory? Is matter necessary for understanding QBHs?

(Effective theory of dust collapse may provide a hint: collapse \rightarrow metastable BH \rightarrow shock wave.)

- ▶ Param: LQG of the Schwarzschild solution; interior/exterior; comparison of approaches; open questions.
- ▶ Muxin: Covariant effective dynamics for vacuum for spherically symmetric spacetimes; BH solution; BH-WH transition.
- ▶ Ed: Effective theory for dust collapse; weak solutions and shock waves; dynamical singularity resolution; implications for information loss.