



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Wormholes without averaging

(Zoom Seminar)

Phil Saad

(IAS)

Date: April 16, 2021

Time: 9.00 am IST

Zoom link shall be shared separately



After averaging over fermion couplings, SYK has a collective field description that sometimes has “wormhole” solutions. We study the fate of these wormholes when the couplings are fixed. Working mainly in a simple model, we find that the wormhole saddles persist, but that new saddles also appear elsewhere in the integration space – “half-wormholes.” The wormhole contributions depend only weakly on the specific choice of couplings, while the half-wormhole contributions are strongly sensitive. The half-wormholes are crucial for factorization of decoupled systems with fixed couplings, but they vanish after averaging, leaving the non-factorizing wormhole behind.