# New Horizons Solvay Lectures in Physics (Online)

## Professor Douglas Stanford
### (STANFORD UNIVERSITY, USA)

Douglas Stanford is a professor at Stanford University. As a member of It from Qubit, he was a postdoc at the Institute for Advanced Study, in Princeton, New Jersey. He received his Ph.D. from Stanford University under the supervision of Leonard Susskind. His recent work has focused on the quantum properties of black holes and on chaotic dynamics in systems with many degrees of freedom. With Juan Maldacena and Stephen H. Shenker, he proved a bound on many-body chaos that is saturated by black holes. Stanford was awarded the 2018 New Horizons in Physics Prize by the Fundamental Physics Prize Foundation for his work on improving the understanding of quantum mechanics of black holes via chaos theory.

## Tuesday 8 June 2021 at 4.00 pm.
### Lecture 1: Spacetime wormholes and their baggage

We review the definition of spacetime wormholes and their interpretation by Coleman as describing an average over couplings. We describe the factorization paradox associated to wormholes in AdS/CFT.

*Zoom link: https://zoom.us/j/93471184487?pwd=ZE5GQ29GZXc2UHAySDkxZjN6NEcxZz09*

## Friday 11 June 2021 at 4.00 pm.
### Lecture 2: Putting wormholes to work

We examine cases where spacetime wormhole solutions exist and discuss their interpretation: the eternal traversable wormhole, the "double cone" and the spectral form factor, a connection to matrix integrals, and the Page curve.

*Zoom link: https://zoom.us/j/97810064908?pwd=c3BpN3BZbksxU0FhMnJ2M3F6OTBXUT09*

## Tuesday 15 June 2021 at 4.00 pm.
### Lecture 3: Wormholes without averaging

We discuss an analog of wormholes in the SYK model and analyze what happens to them in a theory with fixed couplings, addressing in this context the factorization problem introduced in lecture 1.

*Zoom link: https://us02web.zoom.us/j/82900108659?pwd=THZoek01QnpnUHNRZWI5ZDdvVkVC*

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