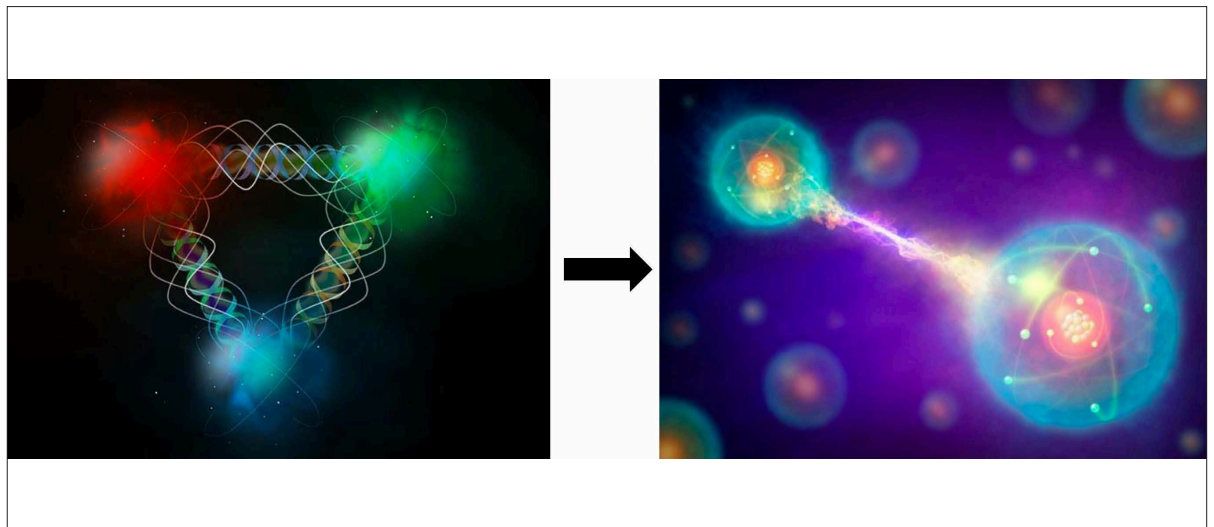




**Rene Bellwied**

University of Houston

**May 19, 2022 at 1:00 p.m. in WL-216 & Zoom**  
**From the Initial to the Final State - Quantum Entanglement in Relativistic Particle Collisions**



Collective quantum effects should play a significant role in the formation of hadrons from a deconfined and chirally symmetric state of matter. Yet most of our models ignore these effects or treat them as corrections after the dynamic calculation (e.g. color reconnection effects in PYTHIA). I will try to show that there is a direct connection between the entanglement entropy in the initial state and the thermodynamic entropy in the final state at least for elementary collisions where not too many decoherence effects are expected. But could a coherent state also effectively replace thermo- or hydro-dynamic descriptions of a high multiplicity partonic state, if the state does not interact strongly? I will show measurements that could be applied in pp and heavy ion collisions to answer this question.

**There will be a luncheon with the speaker from 12-1 p.m. in WL-216. Lunch will be provided for people on a first-come, first-served basis for people who RSVP by Tuesday, May 17th: <https://tinyurl.com/npa-signup>**

Host: Laura Havener

Connection info: <https://yale.zoom.us/j/98300235819>

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