Contribution ID: **29** Type: **not specified**

Binary Black Holes and Scattering Amplitudes

Friday, September 13, 2019 11:00 AM (25 minutes)

We combine tools from the modern amplitudes program and effective field theory to develop a systematic and scalable method for deriving classical dynamics for binary systems from on-shell scattering. Applying this to gravitationally interacting massive scalars yields the first derivation of the conservative Hamiltonian for compact spinless binaries at third post-Minkowskian order. The resulting Hamiltonian is in complete agreement with corresponding terms in state-of-the-art expressions at fourth post-Newtonian order as well as the probe limit at all orders in velocity. Prospects for improving the accuracy of theoretical waveform templates employed in gravitational wave detection are discussed.

Primary authors: ROTHSTEIN, Ira (CMU); CHEUNG, Clifford; BERN, Zvi (Univ. of California Los Angeles (US)); SOLON, Mikhail; ZENG, Mao (Stony Brook University); ROIBAN, Radu (Penn State University); SHEN, Chia-Hsien (UCLA)

Presenter: SOLON, Mikhail

Session Classification: Friday Morning