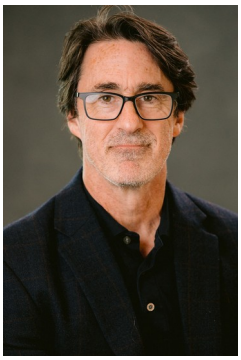

4/03/2019 16.00 auditorio Pi

From the stars to STAR: Intensity interferometry from HBT to heavy ions

Sixty years ago, two radio engineers emerged from the frenzy of World War II and entered the new field of radio astronomy. Robert Hanbury Brown and Richard Twiss developed an entirely new instrument
and technique, based on "correlated noise," to measure the angular radius of previously un-resolvable stars. Initially greeted with skepticism, their work led directly to the birth of quantum optics. At nearly the same time, Goldhaber et al discovered a tiny unexpected correlation in the first true particle physics experiments; until recently, the "GGLP" effect played a minor role in particle physics. It would take another 15 years until the connection between these apparently disparate phenomena was realized by Shuryak, Gyulassy and others around 1976, just as the new field of heavy ion physics was emerging. Thus did Hanbury Brown's discovery give birth to femtoscopy, the most direct method to probe the highly non-trivial dynamic space-time structure of a heavy ion collision. I will discuss the structures and insights that femtoscopy has revealed in ultra-relativistic ion collisions at RHIC and the LHC and how it is leading to a fresh look at high-energy proton collisions.

If time permits, I may discuss recent efforts to revive HBT interferometry in astronomy, deploying modern technological advances, including lab work at Ohio State.