

## The 167th HENPIC seminar by Prof. Min He, Nanjing University of Sci. & Tech., June 23th, Thursday, 10:30 am (Beijing time)

Title: Collectivity of  $J/\psi$  Mesons in Heavy-Ion Collisions

The production of  $J/\psi$  mesons in heavy-ion collisions at the Large Hadron Collider is believed to be dominated by the recombination of charm and anticharm quarks in a hot QCD medium. However, measurements of the elliptic flow ( $v_2$ ) of  $J/\psi$  mesons in these reactions are not well described by existing calculations of  $J/\psi$  recombination for transverse momenta  $p_T \lesssim 4$  GeV. We revisit these calculations in two main aspects. Employing the resonance recombination model, we implement distribution functions of charm quarks transported through the quark-gluon plasma using state-of-the-art Langevin simulations and account for the space-momentum correlations of the diffusing charm and anticharm quarks in a hydrodynamically expanding fireball. This extends the relevance of the recombination processes to substantially larger momenta than before. We also revisit the suppression of primordially produced  $J/\psi$ 's by propagating them through the same hydrodynamic medium, leading to a marked increase of their  $v_2$  over previous estimates. Combining these developments into a calculation of the  $p_T$ -dependent nuclear modification factor and  $v_2$  of inclusive  $J/\psi$  production in semicentral Pb-Pb collisions at the LHC, we find a good description of the experimental results by the ALICE Collaboration. Our results thus resolve the abovementioned  $v_2$  puzzle and imply the relevance of recombination processes for  $p_T$ 's of up to  $\sim 8$  GeV.

About the speaker: Min He earned his PhD from Nanjing University and then moved to Texas A&M University as a postdoc. Now he is a faculty member at Nanjing University of Science & Technology. His research interest lies in the field of heavy quark and quarkonium physics in the quark-gluon plasma.