

The 153th HENPIC seminar by Dr. Shuai Yang (SCNU), on Nov. 25, Thursday, 10:30 am, Beijing time, 2021

Title: Converting light into matter: using the Breit-Wheeler process to probe QGP medium

Abstract: The Lorentz boosted electromagnetic fields shrouding relativistic heavy ions can be treated as a flux of linearly polarized quasi-real photons. The Breit-Wheeler process is the simplest process in quantum electrodynamics for converting light quanta into a matter lepton and its anti-matter counterpart. Recently, there has been intense interest in investigating the Breit-Wheeler process and its possible application to study the quark-gluon plasma (QGP). In this talk, I will firstly introduce the current achievements of the Breit-Wheeler process based on experimental results in ultra-peripheral heavy-ion collisions with the STAR experiment at the RHIC and the CMS experiment at the LHC. Then I will extend the Breit-Wheeler pair production to hadronic collisions and discuss the possibility of using the Breit-Wheeler process to probe the electromagnetic properties of QGP medium.

[1] CMS, PRL 127 (2021) 122001

[2] STAR, PRL 127 (2021) 052302

[3] STAR, PRL 121 (2018) 132301

About the speaker: Shuai Yang is currently a professor in South China Normal University (SCNU). His research interests are exploring the photon-induced physics and QGP properties by using dilepton and quarkonium with the RHIC-STAR and LHC-CMS experiments. He received his B.S. degree and Ph.D from USTC in 2010 and 2016, respectively. Afterwards he worked as a postdoc at Brookhaven National Laboratory and Rice University before joining SCNU.