

**Invited speaker****Prof. Chang Hee Nam**

Center for Relativistic Laser Science,  
Institute for Basic Science

Affiliation / Center for Relativistic Laser Science, Institute for Basic Science, Korea  
e-mail / [chnam@gist.ac.kr](mailto:chnam@gist.ac.kr)

**Development of an ultrahigh intensity multi-PW laser and exploration of strong field physics****Abstract**

At the Center for Relativistic Laser Science (CoReLS) a 20 fs, 4 PW laser was developed in 2016 and has been operated for the exploration of strong field physics for the last five years. The 4 PW laser is a chirped pulse amplification Ti:Sapphire laser with repetition rate of 0.1 Hz. Recently we achieved the record-breaking laser intensity of  $1.1 \times 10^{23}$  W/cm<sup>2</sup> by tightly focusing a wavefront-corrected multi-PW laser pulse. By focusing multi-PW laser pulses to a He gas cell, multi-GeV electron beams could be generated using the laser wakefield acceleration scheme. As part of strong field quantum electrodynamics research, we have investigated the Compton scattering between a multi-GeV electron beam and an ultrahigh intensity laser. The analysis of gamma-ray spectra from the Compton scattering showed the production of gamma-rays extending well over 100 MeV, confirming the nonlinear Compton scattering between an electron and several hundred laser photons. In this presentation the ultrahigh intensity multi-PW laser system and strong field physics research at CoReLS will be explained.

**About the Author**

Chang Hee Nam received his Ph.D. in plasma physics from Princeton University. After working at Princeton Plasma Physics Laboratory as a staff research physicist, he joined KAIST in Daejeon, Korea and became a full professor in 1998. He established Coherent X-ray Research Center for the investigation of attosecond science. After moving to GIST in 2012, he established the Center for Relativistic Laser Science (CoReLS), a research center of Institute for Basic Science, for the exploration of strong field physics using femtosecond PW lasers. He is a fellow of American Physical Society and of Optica (formerly OSA).