**Extreme light: Ultra-high intensity 4 PW laser**

An extreme light - ultra-high intensity laser opens a new era in the laser-plasma physics. The ultra-high intensity lasers have been actively developed and their output power has reached over petawatt. We have operated two ultra-intense beamlines with outputs of 1.0 PW and 1.5 PW at 30 fs since 2012 for exploring the laser-driven particle acceleration. Recently, a 20 fs, 4.2 PW laser was successfully developed and started the commissioning experiments. In this talk, the 4.2 PW laser development and the laser technologies boosting the laser output power will be presented.