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Keynote Talk

**Magnetic Turbulence and Shock Formation in Astrophysical
Plasma Modeled with Intense Lasers**

H. Takabe

ILE, osaka University, JAPAN
takabe@ile.osaka-u.ac.jp

The formation scenario of the collisionless shocks such as the surface of supernova remnants in Universe is still open question and is very important relating to the origin of cosmic-rays. We have carried out multi-dimensional PIC simulation to demonstrate that such shock wave can be created by the Weibel instability driven magnetic field, where the magnetic field grows linearly and inverse-cascade becomes important in the nonlinear stage to finally form a collisionless shock structure. We are on going of the laser model experiment to verify this physics with the world biggest lasers, OMEGA and NIF, I would like to report theory and experimental results in my invited talk.