



AAPPS-DPP 2018 Plenary speaker Name: Ryosuke Kodama

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Rationale: His scientific theme investigated over the past 30 years is high power laser applications such as laser acceleration, laser fusion, x-ray generation including x-ray lasers, laboratory astrophysics and related diagnostics as well as high power laser technology development. He is now exploring high energy density sciences in methods of introducing a Plasma Photonic, High Energy Density Solid Matter generated at extremely high-pressure conditions, Laser Fusion and etc. As his other topics, theoretical approach is also being made on nonlinear optics in vacuum with super ultra-intense laser light or Vacuum Quantum Optics. He published more than 400 top quality papers such as Nature and had more than 100 invited talks on the high energy density sciences. From 2017, he is a director of ILE Osaka University and leading high power laser and high energy density sciences in Japan. The ILE is originated in the field of laser fusion and now exploring broader area of science using high power lasers to create interdisciplinary fields and develop innovative technology. In his talk, he will present the recent topics high energy density science with high power lasers in Japan as well as the prospect of ILE to leading the field in the world. Therefore, he is appropriate for the plenary speaker in the conference.

Talk Title: High Energy Density science with high power lasers in Japan

Short abstract: High Energy Density (HED) science with high power lasers is based on the research on a variety of extreme states of matter such as warm dense matter (WDM), high pressured plasmas, radiative plasmas, fusion burning plasmas, relativistic plasmas and electro-positron plasmas. These extreme states of matter enable us a lot of applications such as particle acceleration, laboratory astrophysics, material science, nuclear photonics and laser fusion. These applications are well in progress with technologies of high power lasers including XFEL and related plasma devices.

In Japan, ILE is now exploring the HED science with developing high power lasers as the COE on this field in Japan. Some of the topics on HED science are being promoted as a project or project initiative in ILE, e.g., Fast ignition research in laser fusion with kJ-PW lasers as the FIREX project, laser-drive ion acceleration and neutron source development: Laser Nuclear Engineering project (LANE), laser-wake field electron acceleration: LAPLACIAN project, high pressured condensed matter and material science with high power lasers and XFEL: HERMES project, high averaged and high power laser development for HED science: J-EPOCH project, and laser astrophysics research such as collisionless shock: Laser Astrophysics project initiative.

In the conference, recent progresses in these projects are presented and also discussed on the prospect of HED since in Japan.

List of related published papers

1. N. Iwata and et al, Nature Comm. **9**, 623(2018)
2. M. Bailly-Grandvaux and et al, Nature Comm. **9**, 102(2018)
3. A. Yogo and et al, Sci. Rep. **7**, 42451 (2017)
4. B. Albertazzi and et al., Science Advances **3**, e1602705 (2017)
5. C. M. Huntington and et al., Nature Physics **11**, 173 (2015)