



15th International Conference on High Energy Density Laboratory Astrophysics / 14th International Conference on High Energy Density Science

## Conference Program

Apr 20 (Mon)

8:30 9:00 Registration

**Session 1 [ Astro/Pulse Power ]** *Chair: M. Knudson*

- 9:00 R. Kodama Opening Remarks  
(ILE, U Osaka)
- 9:10 *Invited* S01.1 M. Tsujimoto Bridging astrophysical and laboratory plasmas  
(JAXA)
- 9:35 *Invited* S01.2 G. Loisel The ZAPP collaboration: Elucidating astrophysical puzzles using the Z facility  
(SNL)
- 10:00 *Invited* S01.3 S. Merlini Investigating shock-driven turbulence in high energy density plasmas at the MAGPIE pulsed-power facility  
(ICL)
- 10:25 S01.4 Y. Wang Morphology and bow shock formation in radiative supersonic flows  
(U York)  
[Substitute Presenter: X. Zhao (U York)]

10:40 10:55 Coffee Break

**Session 2 [ Collisionless Shock ]** *Chair: D. Schaeffer*

- 10:55 *Invited* S02.1 L. Orusa Particle acceleration in perpendicular shocks: from the Lab to the Cosmos  
(Princeton U)
- 11:20 *Invited* S02.2 S. Matsuikiyo Spatiotemporal resolution of ion-scale structures in a magnetized plasma shock reproduced by using power laser experiment  
(Kyushu U)
- 11:45 *Invited* S02.3 T. Johnson Biermann-battery-driven magnetized collisionless shock precursors in laser-produced plasmas  
(LLNL)
- 12:10 S02.4 R. Dorst Direct, laboratory evidence of ion reflection in super-critical, perpendicular shock  
(LLNL)

12:25 14:00 Lunch Break

**Session 3 [ Astro Plasma/Instability ]** *Chair: T. Sano*

- 14:00 *Invited* S03.1 D. Ryu Shock waves, turbulence, and particle acceleration in clusters of galaxies  
(UNIST)
- 14:25 *Invited* S03.2 G. Rigon Hydrodynamic turbulence in supernova remnants: A laboratory astrophysics approach  
(LULI)
- 14:50 *Invited* S03.3 S. Nagel Experiments on high energy density Rayleigh Taylor and Richtmyer Meshkov flows at the National Ignition Facility  
(LLNL)
- 15:15 S03.4 A. Marret Particle-in-Cell simulations of the current filamentation instability in laser produced solid density plasmas  
(SLAC, Stanford U)

15:30 15:45 Coffee Break

**Session 4 [ Shock Physics ]** *Chair: S. Tanaka*

- 15:45 *Invited* S04.1 A. Bott Experimental characterisation of microturbulence-suppressed thermal conduction in weakly collisional, magnetised plasma  
(U Oxford)
- 16:10 S04.2 P. Tchorz Application of cavity-type targets: extreme state of laser-produced plasma and fusion reactions using kilo-Joule, nanosecond laser system  
(IPPLM)
- 16:25 S04.3 G. Radureau Using artificial intelligence to extrapolate radiative shock simulations  
(CEA)
- 16:40 S04.4 D. Oportus Radiative shock interaction with dense cloud analogues in magnetized media  
(LULI)

**Poster Session 1 @ 304 Foyer**

16:55 18:00 [Poster List](#)

Apr 21 (Tue)

**Session 5 [ Astro/Neutron Star ]** *Chair: D. Casey*

- 9:00 *Invited* S05.1 M. Tanaka Radiation from heavy-element plasma in neutron star mergers  
(Tohoku U)
- 9:25 *Invited* S05.2 D. Kato From high-density plasma experiments to kilonova spectra: Assessment of radiative transition probabilities for lanthanide ions  
(NIFS)
- 9:50 S05.3 H. LeFevre Radiation transport in strongly coupled plasmas relevant to neutron star envelopes  
(U Michigan)
- 10:05 *Invited* S05.4 S. Weng Origin of the prolonged eclipse in spider pulsar binaries solved with advanced polarimetry  
(SJTU)

10:30 10:40 Coffee Break

**Poster Session 2 @ 304 Foyer**

10:40 12:00 [Poster List](#)

12:00 13:30 Lunch Break

**Session 6 [ Plasma Turbulence ]** *Chair: M. Lemoine*

- 13:30 *Invited* S06.1 F. Bacchini Fully kinetic simulations of compact-object accretion and outflows  
(KU Leuven)
- 13:55 *Invited* S06.2 Y. Kawazura Inertial range of MRI turbulence and its implications for gyrokinetic heating  
(Utsunomiya U)
- 14:20 *Invited* S06.3 V. Valenzuela-Villaseca Frontiers in magnetized rotating plasmas: a path to accretion disc physics in the laboratory  
(LLNL)
- 14:45 S06.4 M. N. Ly Proton acceleration by collisionless shocks in supermassive black hole coronae: Implications for high-energy neutrinos  
(ILE, U Osaka)

15:00 15:15 Coffee Break

**Session 7 [ Laser Plasma/ICF ]** *Chair: B. Remington*

- 15:15 S07.1 H.-S. Park Probing astrophysical collisionless shocks with laboratory experiments  
(LLNL)
- 15:30 S07.2 Y. Sentoku Plasmas evolving with nuclear fusions driven by non-thermal particles  
(ILE, U Osaka)
- 15:45 S07.3 S. Palaniyappan Development of volume-burn double shell implosions at the National Ignition Facility for  
(LANL)

16:00	S07.4	D. Casey (LLNL)	nuclear astrophysics Thermonuclear reactions probed at stellar core conditions with laser-based inertial confinement fusion
16:15	S07.5	M. Caetano de Sousa (U Bordeaux)	Cylindrical inertial confinement fusion experiments in the presence of strong magnetic fields
16:30	S07.6	D. Liu (Peking U)	Mitigating laser-plasma instabilities by two-color light with large frequency separation

18:30 HEDLA/HEDS Dinner @ La Cocorico Yokohama Akarenga Souko

### Apr 22 (Wed)

#### Session 8 [ Astro/Cosmic Ray ] Chair: D. Ryu

9:00	Invited S08.1	T. Fujii (OMU)	The Amaterasu particle: Searching for the universe's most energetic particles
9:25	S08.2	A. Vanthieghem (Sorbonne U)	Fast radio bursts as precursor radio emission from monster shocks
9:40	S08.3	X. Davoine (CEA)	High electron charge accelerated in the SM-LWFA regime with the LMJ-PETAL laser
9:55	S08.4	Y. Ohira (U Tokyo)	Decay of Alfvén waves in partially ionised plasma revisited

10:15 10:45 Coffee Break

#### Session 9 [ Collisionless Shock ] Chair: Y. Sakawa

10:25	Invited S09.1	W. Yao (Sorbonne U)	Particle acceleration in laser-driven magnetised shocks and their collisions
10:50	Invited S09.2	D. Schaeffer (UCLA)	Anomalous electron heating in laser-driven magnetized collisionless shocks
11:15	S09.3	A. Triantafyllidis (LULI)	Laser-produced, magnetized blast waves: Dynamics and Zeeman splitting observations
11:30	S09.4	E. d'Humieres (U Bordeaux)	Recent progresses on the study of the development of collisionless shocks using Particle-in-Cell simulations and laboratory experiments with high power lasers

11:45 12:00 Group Photo

12:00 13:30 Lunch Break

#### Session 10 [ Laser Ion Acceleration ] Chair: W. Yao

13:30	Invited S10.1	Y. Kuramitsu (U Osaka)	Relativistic astrophysical plasmas in the laboratories: On the origins of cosmic rays
13:55	Invited S10.2	T. Ziegler (HZDR)	Advancing the energy frontier of plasma-based proton acceleration with petawatt lasers
14:20	Invited S10.3	C.-H. Nam (GIST)	High Energy Proton Generation from Ultrathin Solid Targets Driven by a Multi-PW Laser
14:45	S10.4	Y. Fukuda (QST)	Generation of quasi-monoenergetic proton bunches exceeding 100 MeV via the interaction of micron-scale hydrogen cluster targets with PW-class laser pulses

15:00 15:10 Coffee Break

### Poster Session 3 @ 304 Foyer

15:10 16:00 [Poster List](#)

16:15 18:45 OPIC Plenary Session

19:15 OPIC Conference Banquet

### Apr 23 (Thu)

#### Session 11 [ Magnetized Turbulence ] Chair: S. Bulanov

9:00	Invited S11.1	M. Lemoine (U Paris-Cite)	Particle acceleration and transport in large-amplitude turbulence
9:25	Invited S11.2	D. Yuan (CAS)	Electron stochastic acceleration in laboratory-produced kinetic turbulent plasmas
9:50	S11.3	J. Fuchs (LULI)	Generation and characterization of scaled magnetic turbulence in the laboratory [Substitute Presenter: W. Yao (Sorbonne U)]
10:05	S11.4	M. Yang (SJTU)	Turbulent dynamo in colliding supersonic flows

10:20 10:35 Coffee Break

#### Session 12 [ MHD Simulation ] Chair: H. Ji

10:35	Invited S12.1	P. Tzeferacos (U Rochester)	Laboratory experiments of astrophysical processes in magnetized turbulence
11:00	Invited S12.2	Y. Mizuno (SJTU)	Recent progress of GRMHD simulations of black hole accretion flows
11:25	S12.3	K. Morikawa (UTokyo)	Relativistic turbulence in relativistic shock waves driven by the shock downstream region
11:40	Invited S12.4	X.-N. Bai (Tsinghua U)	The magnetohydrodynamic-particle-in-cell method, its applications and extension

12:05 13:30 Lunch Break

### OPIC Poster Session @ Exhibition Hall

13:30 15:00 [Poster List](#)

15:00 15:15 Coffee Break

#### Session 13 [ Laser Plasma ] Chair: N. Iwata

15:15	S13.1	S. Bulanov (ELI-BL)	Photon acceleration in magnetized plasma
15:30	S13.2	S. Tanaka (Aoyama Gakuin U)	Side-scattered signals of induced Compton scattering
15:45	S13.3	B. Torrance (U Strathclyde)	Enabling a high-repetition rate laser-driven ion source at SCAPA
16:00	S13.4	M. Fischer (TU Darmstadt)	Stopping power experiments with the laser-driven ion beamline LIGHT
16:15	S13.5	I. Pomerantz (Tel-Aviv U)	Dynamics of micrometric objects immersed in intense laser fields
16:30	S13.6	K. Sakai (NIFS)	Bayesian inference of velocity distribution functions from collective Thomson scattering

18:45 HEDLA/HEDS Excursion: Factory Night View Boat Cruise

Apr 24 (Fri)

**Session 14 [ Magnetic Reconnection ]** *Chair: J. Santos*

- 9:00 *Invited* S14.1 **H. Ji** Magnetic reconnection: Past, present, future, and  
(Princeton U) HEDLA Experiments
- 9:25 *Invited* S14.2 **F. Guo** The origin of nonthermal particle acceleration  
(LANL) during magnetic reconnection
- 9:50 S14.3 **T. Morita** Characterizing energy conversion and topology-  
(Kyushu U) dependent reconnection in self-magnetized laser-  
produced plasmas
- 10:05 S14.4 **J. Latham** Cylindrical laser-driven magnetic reconnection  
(U Michigan)
- 10:20 S14.5 **K. Krushelnick** Dynamics and control of magnetic fields in  
(U Michigan) relativistic intensity laser produced plasmas

10:35 10:50 Coffee Break

**Session 15 [ Warm Dense Matter ]** *Chair: N. Ozaki*

- 10:50 *Invited* S15.1 **T. Doeppner** Observing the onset of pressure-driven K-shell  
(LLNL) delocalization
- 11:15 S15.2 **M. Knudson** Investigating the Liquid-Liquid, Insulator-to-Metal  
(SNL) Transition in Hydrogen and Deuterium
- 11:30 S15.3 **F. Coppari** The structure and equation of state of high  
(LLNL) energy density iron and iron-nickel alloys at Super-  
Earth core conditions
- 11:45 S15.4 **D. Murayama** Diffusion mechanism of carbon in C-H-O doubly  
(U Osaka) superionic state

12:00 13:30 Lunch Break

**Session 16 [ New Frontier/Pair Plasma ]** *Chair: H.-S. Park*

- 13:30 *Invited* S16.1 **H. Saitoh** Toward experimental studies of Ion high-beta  
(U Tokyo) plasma and electron-positron plasma in dipole  
magnetic fields
- 13:55 *Invited* S16.2 **G. Gregori** Accelerator's experiments to probe beam  
(U Oxford) instabilities in Blazars' pair jets
- 14:20 S16.3 **S. Kamijima** Wave propagation and induced scattering in  
(Kyoto U) magnetized electron-positron pair plasma
- 14:35 S16.4 **S. Lee** GeV-scale charge-neutral pair beams from  
(GIST) bremsstrahlung photons and gamma-ray  
spectrometry

14:50 15:05 Coffee Break

**Session 17 [ Collisionless Shock ]** *Chair: G. Gregori*

- 15:05 *Invited* S17.1 **J. Santos** Ion acceleration in quasi-critical plasmas using  
(U Bordeaux) high-density transparent gas jets: towards high-  
repetition rate sources for fundamental science  
and applications
- 15:30 *Invited* S17.2 **G.-Y. Hu** Laboratory observation of ion drift acceleration via  
(USTC) reflection off laser-produced magnetized  
collisionless shocks

- 15:55 S17.3 **T. Seebaruth** Simulations and experiments of shocks in weakly  
(Sorbonne U) collisional plasmas
- 16:10 S17.4 **Y. Sakawa** Multicomponent-ion acceleration by high-intensity  
(ILE, U Osaka) laser-driven collisionless electrostatic shock
- 16:25 **B. Remington** Closing Remarks  
(LLNL)

**Poster List**

- P.01 **A. Amouretti** Laser-driven shock compression and Hugoniot of  
(U Osaka) CaSiO<sub>3</sub> glass up to 900 GPa
- P.02 **F. Canova** High-repetition-rate continuous liquid plasma mirrors for  
(Newtron SAS) relativistic high-order harmonics and fast neutron  
generation
- P.03 **F. Coppari** The High Energy Density Science Center at LLNL:  
(LLNL) Opportunities for education, outreach and community  
engagement
- P.04 **X. Davoine** High electron charge accelerated in the SM-LWFA  
(CEA) regime with the LMJ-PETAL laser
- P.05 **R. Dorst** Effects of supernova X-ray irradiation on Earth-like  
(LLNL) atmospheres
- P.06 **A. Engel** Multi-signature detection of solid-liquid phase transitions  
(Ariel U) in laser-compressed materials using Photonic Doppler  
Velocimetry
- P.07 **A. J. Fernando** Coulomb explosion in nonuniformly charged  
(UP Diliman) nanospheres of ion mixtures
- P.09 **R. Furukawa** Compression properties of polyamide 6 (C<sub>6</sub>H<sub>11</sub>ON)  
(U Osaka) under laser-driven shock compression and conditions for  
diamond formation in ice giant interiors
- P.10 **J. R. Grefal** Magnetic field sign reversal in escargot targets using  
(UP Diliman) relativistic lasers
- P.11 **M. Hata** Generation of highly charged gold ion beam in dense  
(QST) gold plasma driven by an ultrahigh-intensity  
femtosecond laser
- P.12 **I. Huegel** Laboratory tests of transient heating and atomic kinetics  
(U Michigan) in photoionized plasma
- P.13 **T. Iizuka** Experimental verification of formation conditions for  
(U Osaka) collisionless electrostatic shocks
- P.14 **S. Isayama** Relativistic multi-stage resonant and trailing-field  
(Kyushu U) acceleration induced by large-amplitude Alfvén waves in  
a strong magnetic field
- P.15 **W. Ishizaki** Parametric instability of large-amplitude Alfvén wave in  
(Tohoku U) relativistically magnetized plasma
- P.16 **N. Iwata** Demonstration of improvement of energy coupling from  
(ILE, U Osaka) kJ PW laser to protons using electron confinement  
effect
- P.17 **D. Kashizaki** Partition of the energy injection rate between Alfvénic  
(Tohoku U) and compressive fluctuations in Parker instability

P.18	<b>S. Kisaka</b> (Hiroshima U)	The centrifugal acceleration in pulsar magnetospheres	P.43	<b>C. Song</b> (GIST)	Spatiotemporal temperature dynamics of warm dense matter via optimized ion beam heating
P.19	<b>D. Kita</b> (U Osaka)	Spatial profiles of plasma density and temperature in laser driven collisionless electrostatic shocks	P.44	<b>C. Song</b> (GIST)	Ti-dependent electron-ion coupling in non-equilibrium melting of Copper
P.20	<b>K. Kondo</b> (Kyoto U)	Data-driven approach using Physics-Informed Neural Network to estimate partial differential equation governing electrostatic solitary wave	P.45	<b>K. Sugimoto</b> (Kyoto U)	Modified growth rate of linear tearing instability for relativistic collisionless plasma
P.22	<b>H. Kusano</b> (U Osaka)	Measurement of secondary fragments in stack detectors using machine learning	P.47	<b>Y. Takagi</b> (U Osaka)	Stochastic acceleration of electrons in SRS-induced sub-relativistic laser-plasma interactions
P.23	<b>S. Lee</b> (GIST)	Electron-ion energy relaxation times up to 100 eV in warm dense aluminum and gold	P.48	<b>K. Taketoshi</b> (U Osaka)	In-situ XRD measurements of laser shock compressed CHO materials and an investigation of diamond formation conditions
P.24	<b>Y.-L. Liu</b> (NCKU)	Nonthermal electron acceleration and transition probability density in turbulent wakefields driven by an intense laser pulse	P.49	<b>T. Takezaki</b> (U Toyama)	Magnetic field generator for laser-produced plasma experiments in rarefied gas
P.25	<b>Y.-L. Liu</b> (NCKU)	Topological data analysis and singular value decomposition of nonthermal relativistic electron acceleration induced by an intense light pulse	P.50	<b>N. Tamaki</b> (U Osaka)	High-energy ion acceleration driven by a picosecond laser using Au-coated large-area suspended graphene
P.26	<b>Y.-L. Liu</b> (NCKU)	Theoretical model for hybrid proton acceleration scheme with dual-laser pulses	P.51	<b>R. Tanigo</b> (U Osaka)	Cosmic ray acceleration in shock-shock Interaction
P.27	<b>A. N. Logarta</b> (UP Diliman)	PIC simulation of double paisley target configurations for compression and magnetic reconnection	P.52	<b>P. Tchorz</b> (IPPLM)	Application of cavity-type targets: Extreme state of laser-produced plasma and fusion reactions using kilo-Joule, nanosecond laser system
P.28	<b>Z. Ma</b> (Beijing Normal U)	Impact pressure shaping plasma jets and affected by high-metallicity	P.53	<b>E. Toro</b> (Stanford U)	Identifying the influence of nanoscale structure on the DC conductivity of warm dense matter
P.30	<b>J. J. Miranda</b> (UP Diliman)	Generation of strong magnetic fields via ultraintense laser irradiation of a tetrafoil-enclosed microtube	P.54	<b>R. Tsuchihashi</b> (U Osaka)	Optimal conditions for two-stage acceleration via magnetic vortex acceleration and collisionless shock acceleration
P.31	<b>K. Moczulski</b> (Ecole Polytechnique)	Numerical simulations studying the interplay of small- and large-scale turbulent dynamo	P.55	<b>T. Wei</b> (QST)	Acceleration measurement of a relativistic flying mirror in underdense plasma
P.32	<b>T. Nakamura</b> (FIT)	Self-force formula of a charged particle in uniform acceleration motion	P.56	<b>N. Yamagata</b> (U Osaka)	The Hugoniot temperature of nanopolycrystalline diamond
P.33	<b>F. Nikaido</b> (U Osaka)	Electric and magnetic fields measurements of laser-produced plasmas with solid-state nuclear track detectors using machine learning	P.57	<b>H. Yanagawa</b> (U Osaka)	Theoretical study of propagation characteristics of relativistic electromagnetic waves in inhomogeneous plasma
P.34	<b>N. Okuda</b> (U Osaka)	Heat transport in dense plasmas driven by non-local electrons generated at steepened laser-plasma interface	P.59	<b>O. Zabiolle</b> (Amplitude Laser)	Versatile Joule-class OPA as front-end laser for inertial fusion research
P.37	<b>T. Pikuz</b> (ILT)	K-shell Spectroscopy of Mid-Z Foils at laser intensities exceeding $10^{22}$ W/cm <sup>2</sup>	P.60	<b>A. Mohapatra</b> (Rochester U)	Hall-MHD fluctuation dynamo in driven turbulence
P.38	<b>E. Quimpo</b> (UP Diliman)	Particle-in-cell analysis of hard x-ray production in ultra-relativistic microtube implosion for varying microtube core materials			
P.39	<b>B. Remington</b> (LLNL)	Exploring the universe through NIF Discovery Science			
P.40	<b>N. Sakai</b> (U Osaka)	Neutrino emission from cosmic rays accelerated at wind-driven shocks in active galactic nuclei			
P.41	<b>T. Sano</b> (ILE, U Osaka)	Gamma-ray generation via relativistic two-wave resonance driven by intense laser light			
P.42	<b>K. Seto</b> (NIFS)	Quantum origin of classical background EM fields from coherent states			