

Third International Conference on
SUPERSTRONG FIELDS IN PLASMAS

Villa Monastero, Varenna, Italy
September 19 - 24, 2005

CONFERENCE PROGRAMME

Monday, September 19th

8:00 - 8:40

Registration

8:40 - 9:00

Welcome

9:00 – 13:00

Session 1: Fundamental atomic and plasma processes and nonlinear phenomena in ultra-intense fields

Session Coordinator: **Ch. Joachain** (Université Libre, Bruxelles)

Invited Speakers:

L. Gizzi (IPCF-CNR, Pisa)

“Measurements of ultrafast ionisation dynamics from intense laser interactions with gas-jets”

P. Mulser (University of Darmstadt)

“The physics of collisionless absorption of relativistic laser beams in solids and clusters”

A.M. Sergeev (IAP-RAS, N. Novgorod)

“Attosecond pulse production using excited atoms and molecules”

S.A. Uryupin (Lebedev - RAS, Moscow)

“High frequency even harmonics generation in the plasmas with electron fluxes”

K. Yamanouchi (University of Tokyo)

“Ultrafast dynamics of hydrocarbon molecules in intense laser fields: skeletal bond breaking, ejection of triatomic-hydrogen molecular ions and hydrogen-atom migration”

13:00 **Group photo in the gardens of Villa Monastero**

13:15 – 15:00 LUNCH

15:00 – 18:30

Session 2: Fast Ignition

Session Coordinator: **S. Azteni** (University of Rome)

Invited Speakers:

S. Atzeni (University of Rome)

“Ignition requirements and gain curves for the fast ignitor”

R. B. Campbell (Sandia, Albuquerque)

“Fast ignition studies at Sandia National Laboratories”

P. Kaw (IPR, Gandhinagar)

“Anomalous stopping of energetic electrons in fast ignition concept of laser fusion”

P. Norreys (RAL, London)

title not available

21:30 **Welcome Party at the Hotel Royal Victoria**

Tuesday, September 20th

9:00 – 13:00

Session 3: Relativistic Non Linear Optics

Session Coordinator: **A. Mysyrowicz** (LOA, Palaiseau)

Invited Speakers:

T. Zh. Esirkepov (JAERI, Kizu)

“Scaling laws of the terawatt-petawatt laser ion acceleration”

Z. Najimudin (Imperial College, London)

“Properties of relativistic laser pulses travelling through underdense plasmas”

N.M. Naumova (Univ. of Michigan, Ann Arbor)

“Attosecond phenomena in the relativistic lambda cubed regime”

M.M. Skoric (Vinca INS, Belgrade)

“Stimulated Raman cascade into photon condensation and generation of e.m. solitons in relativistic plasmas”

D. Umstadter (Univ. of Nebraska, Lincoln)

“Generation of ultrashort pulses of electrons, X-rays and optical pulses by relativistically strong light”

13:00 – 15:00

LUNCH

15:00 – 19:00

Session 4: Solid density plasmas, cluster plasmas, and nuclear physics with intense lasers

Session Coordinator: **R. Sauerbrey** (University of Jena)

Invited Speakers:

B.N. Breizman (University of Texas at Austin)

“Ion acceleration in laser-irradiated micro-clusters”

T. Ditmire (University of Texas at Austin)

“Explosions of femtosecond laser irradiated heteronuclear clusters”

E. Gamaly (Australian Nat. Univ., Canberra)

“Non-equilibrium transformations of solids by lasers with the pulse duration shorter of all relaxation times”

K. Ledingham (University of Glasgow)

“Laser Induced Nuclear Phenomena and Applications”

F. Pegoraro (University of Pisa)

“Efficient laser acceleration of proton beams for intense sources of low energy neutrinos”

Wednesday, September 21st

9:00 – 13:00

Session 5: Laser ion acceleration

Session Coordinator: **V. Tikhonchuk** (CELIA, Bordeaux)

Invited Speakers:

M. Borghesi (Queen's University of Belfast)

“Ultrafast charge dynamics initiated by high-intensity, ultrashort laser-matter interaction”

H. Daido (JAERI, Kizu)

“Development of laser-driven ion source”

J. Fuchs (LULI, Palaiseau)

“Scaling laws for proton acceleration from the rear surface of laser-irradiated thin foils”

A. Macchi (INFN, University of Pisa)

“Laser Acceleration of Ultrashort Ion Bunches and Femtosecond Neutron Sources”

P. Mora (Ecole Polytechn., Palaiseau)

“Thin foil expansion into a vacuum and fast ion production”

M. Tampo (ILE, Osaka)

“Study of strong electrostatic fields from angular distribution of proton energy spectra in ultra-intense laser plasma interactions”

13:00 – 15:00

LUNCH

15.00

Departure for trip

19:00

Social Dinner

Thursday, September 22nd

9:00 – 13:00

Session 6: Laser electron acceleration

Session Coordinator: **V. Malka** (LOA, Palaiseau)

Invited Speakers:

Y. Glinek (LOA, Palaiseau)

“Production of quasi-monoenergetic electron bunches in laser-plasma based accelerators ”

E. Liang (Rice University, Houston)

“Sustained acceleration of overdense plasmas by colliding laser pulses”

E. Miura (AIST, Tsukuba)

“Monoenergetic electron beam generation from a high-density plasma produced by a 2-TW, 50-fs laser pulse”

I.V. Pogorelsky (BNL, Upton)

“Femtosecond microbunched electron beam: a new tool for advanced accelerator research”

A.N. Stepanov (IAP-RAS, N. Novgorod)

“Propagation of high intense femtosecond laser pulses in gas-filled dielectric capillary tubes: nonlinear effects”

13:00 – 15:00

LUNCH

15:00 – 18:30

Session 7: Lasers for ultrahigh intensity Physics

Session Coordinator: **O. Svelto** (Polytechnic of Milan)

Invited Speakers:

V.M. Gordienko (Moscow State Univ.)

“Design and performance of a petawatt subpicosecond CO₂-N₂O-laser pumped by HF – chemical laser radiation”

U. Keller (ETH, Zurich)

“High intensity pulse generation in the few-optical-cycle regime”

G. Mourou (LOA, Palaiseau)

“High Peak and High Average Power Systems”

Ch. Rhodes (Univ. of Illinois at Chicago)

“New coherent X-ray source at $\lambda = 2.8 \text{ \AA}$ for microimaging of human cancer stem cells”

21:30

Concert in St. Giorgio’s Church

Friday, September 23rd

9:00 – 13:00

Session 8: Laboratory Astrophysics

Session Coordinator: **S. Rose** (University of Oxford)

Invited Speakers:

M. Koenig (Ecole Polytechn., Palaiseau)

“Radiative Shocks: an opportunity to study Laboratory Astrophysics”

S.V. Lebedev (Imperial College, London)

“Laboratory experiments with supersonic radiatively cooled jets: jet deflection via crosswinds and magnetic tower outflows”

D.D. Ryutov (LLNL, Livermore)

“Optimizing laboratory experiments for dynamic astrophysical phenomena”

K. Shigemori (ILE, Osaka)

“Production of strong blast wave with intense laser and its application to astrophysics”

G.J. Tallents (University of York)

“Measuring the solar opacity”

13:00 – 15:00

LUNCH

15:00 – 16:40 POSTER SESSION

16:40 – 17:00 Break

17:00 – 19:00

Forum on Medical Applications of ultra-intense laser-matter interaction

Chairman: **D. Batani** (Un. Milano-Bicocca, Milan))

Invited Speakers:

S. Braccini/U. Amaldi (CERN, Geneve)

“Present and future of Hadrontherapy”

J.C. Kieffer (INRS, Université du Québec)

title not available

V. Malka (LOA, Palaiseau)

“Medical applications with laser plasma accelerators”

Saturday, September 24th

9:00 – 13:00

Session 9: **Attosecond and diagnostics**

Session Coordinator: **D. Charalambidis** (Un. of Crete, Heraklion)

Invited Speakers:

D. Charalambidis (Un. of Crete, Heraklion)

“Extending fs metrology to XUV attosecond pulses”

Kienberger (MPQ, Garching)

“Attosecond control and spectroscopy of electrons”

Merdji (Centre d'Etudes de Saclay)

“Optimization of attosecond pulses”

Nisoli (Polytechnic of Milan)

“Control of electron wave-packets in high-order harmonic generation by few-cycle light pulses”

Platonenko (Moscow State University)

“Efficient generation of attosecond x-ray radiation under interaction of relativistic and ultrarelativistic few-cycle laser pulse with thin film”

13:00 – 13:15 CLOSING

Poster Session

Friday, September 23rd, h. 15:00 – 16:40

1. ***“Laser-plasma electron acceleration by short intense laser pulses”***
N.E. Andreev, M.V. Chegotov, B. Cros, S.V. Kuznetsov, P. Mora,
A.A. Pogosova
2. ***“Harmonic generation from laser-driven vacuum”***
A. Di Piazza, K. Z. Hatsagortsyan, and C. H. Keitel
3. ***“Probing dense plasmas created from intense irradiation of solid target in the XUV domain”***
S. Dobosz, G. Doumy, H. Stabile, P. Monot, Ph. Martin, B. Carré, D. Joyeux, D. Phalippou, R. Mercier, F. Delmotte, S. Hüeller
4. ***“Observation and analysis of strong oscillating electric fields in a ps and fs laser plasma by high-resolution X-ray spectroscopic measurements”***
A. Ya. Faenov, T. A. Pikuz, I. Yu. Skobelev, A. I. Magunov, V. S. Belyaev, V. I. Vinogradov, A. P. Matafonov, V. S. Lisitsa, V. P. Gavrilenko, S. A. Pikuz, Jr., K.Y. Kim, H.M. Milchberg
5. ***“All optical ltrafast synchrotron hard X-ray source”***
Félicie Albert, Kim Ta Phuoc, Rahul Shah, Antoine Rousse
6. ***“Electron diffraction experiments using laser-plasma electrons”***
E.E. Fill, S. Trushin, R. Tommasini, R. Bruch
7. ***“Harmonics generation and critical surface rippling in laser plasmas”***
I.B. Földes, E. Rácz
8. ***“Multiphoton processes and electron-positron pair production”***
K.Z. Hatsagortsyan, C. Müller, C.H. Keitel
9. ***“Prepulse dependence in hard x-ray generation from microdroplets”***
M. Anand, A.S. Sandhu, S. Kahaly, G. Ravindra Kumar, M. Krishnamurthy,
P.Gibbon
10. ***“Hot electron generation and manipulation on ‘structured’ targets”***
P.P. Rajeev, S. Kahaly, S. Bagchi, S. Bose, P.P. Kiran, P. Ayyub, G. Ravindra
Kumar
11. ***“Measurements of femtosecond pulse duration by means of Michelson interferometer without nonlinear elements”***
A. Levchenko, D. Batani, V. Zvorykin
12. ***“Optical reflectivity of multilayer dense plasma produced by ultra-short pulsed power lasers”***
M.H. Mahdieh, M. Shirmahi
13. ***“Pulsed-paraxial effects in the propagation of ultrashort (femtosecond) laser pulses in free space”***

I.V. Murusidze

14. ***“Development of a highly coherent x-ray laser and application research”***
M. Nishikino, H. Kawazome, M. Tanaka, M. Kishimoto, T. Kawachi, N. Hasegawa, Y. Ochi, K. Nagashima
15. ***“Self-consistent propagation of an ultraintense electromagnetic wave in an electron-positron plasma”***
F. Pegoraro, S.S. Bulanov, A.M. Fedotov
16. ***“3-D structure of the magnetic field generated by finite-width counter-streaming electron beams in a collisionless plasma”***
D. Del Sarto, F. Califano, F. Pegoraro
17. ***“Electrohydrodynamic stability of poorly conducting parallel plasma in the presence of strong transverse electric field”***
N. Shubha
18. ***“Combined effects of unsteady electric field and uniform magnetic field on magneto-electroconvection in a poorly conducting plasma”***
M.S. Gayathri
19. ***“Electroconvection in a vertical poorly conducting plasma in the presence of transverse electric field”***
B. S. Shashikala
20. ***“Self-focusing dynamics of few optical cycle pulses”***
A.G. Litvak, V.A. Mironov, S.A. Skobelev
21. ***“Determination of “isotropic” magnetic fields in pulsed plasmas: new approach”***
E. Stambulchik, K. Tsigutkin, Y. Maron
22. ***“MQDT/R-matrix Floquet method for dielectronic recombination”***
Viorica Stancalie
23. ***“Non-adiabaticity of infrared multiphoton dissociation process of styrene ions by CO₂ laser radiation”***
Anatoly V. Stepanov
24. ***“Elementary transformation act model of cluster structure interacting with IR laser radiation”***
Anatoly V. Stepanov
25. ***“Advances high resolution X-ray microscopes for laser-produced plasma”***
Ph. Troussel, J. L. Bourgade, J. P. Champeaux, J.Y. Boutin, R. Marmoret, C. Rémond, R. Rosch
26. ***“Aluminium K-shell high-resolution spectroscopy of short and long scale length plasmas”***
N. C. Woolsey, D. M. Chambers, C. Courtois, E. Förster, C. D. Gregory, I. M. Hall, J. Howe, O. Renner, and I. Uschmann

27. ***“Hot electrons emitted from a thin foil target irradiated by ultrashort intense laser pulses”***
Z. Li, H. Daido, A. Fukumi, A. Sagisaka, K. Ogura, M. Nishiuchi, M. Mori, S. Orimo, Y. Hayashi, M. Kado, T. Zh. Esirkepov, S. V. Bulanov, Y. Oishi, T. Nayuki, T. Fujii, K. Nemoto, S. Nakamura, T. Shirai, Y. Iwashita, A. Noda
28. ***“Petawatt Excimer Laser Project at Lebedev Physical Institute”***
V.D. Zvorykin, A.A. Ionin, V.F. Losev, L.D. Mikheev, A.V. Konyashenko, B.M. Kovalchuk, O.N. Krokhin, G.A. Mesyats, A.G. Molchanov, A.N. Starodub, V.F. Tarasenko, S.I. Yakovlenko
29. ***“Non drifting electromagnetic solitons produced by SBBS”***
M. Lontano, Passoni, C. Riconda, V. Tikhonchuk, S. Weber
30. ***“Quasi-stationary electrostatic field at the sharp interface between high density matter and vacuum in the presence of a relativistic electron population”***
M. Lontano. M. Passoni
31. ***“Fast Electrons Propagation in Conductors and Insulators by Optical Emission Diagnostics”***
M. Manclossi, J.J. Santos, D. Batani, A. Guemnie-Tafo, J. Faure, V. Tikhonchuk, A. Debayle, and V. Malka
32. ***“Ion acceleration at the front- and rear-surface of thin foils with high intensity 40 fs laser pulses”***
S. Ter-Avetisyan, M. Schnürer, J. Schreiber, P. V. Nickles, W. Sandner
33. ***“About electromagnetic fields inside electron”***
A.A. Aliverdiev, A.A. Aliverdiev, A.A. Amirova
34. ***“Time-resolved analysis of the high-power laser plasmas expansion in vacuum”***
A. Aliverdiev, D. Batani, V. Malka, T. Vinci, M. Koenig, A. Benuzzi-Mounaix
35. ***“Energetic electrons in laser-gas jet interactions at about relativistic intensities”***
D. Giulietti, M. Galimberti, A. Giulietti, L. A. Gizzi, P. Köster, L. Labate, P. Tomassini, T. Ceccotti, P. Monot, P. D'Oliveira, Ph. Martin
36. ***“X-rays generation induced by laser powder interaction”***
M. Servol, P. Audebert, F. Quere, M. Bougeard, T. Pikuz, A. Faenov, P. Monot, Ph. Martin, C. Bonté, F. Dorchies, M. Francucci, G. Petrocelli
37. ***“Ion acceleration in short-laser-pulse interaction with solid foils”***
V.T. Tikhonchuk
38. ***“Picosecond laser modification of thin films”***
B. Gakovic, M. Trtica, D. Batani, T. Desai, R. Redaelli