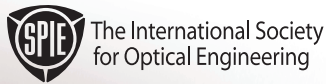


SPIE High-Power Laser Ablation

7-12 May 2006 Sagebrush Inn & Conference Center • Taos, New Mexico USA



Claude R. Phipps, Photonic Associates
Conference Chair

Program Committee

Sergei Anisimov, L.D. Landau Institute for Theoretical Physics (Russia)

Michel Autric, Univ. de la Méditerranée (France)

Dieter Bäuerle, Johannes Kepler Univ. Linz (Austria)

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Dennis Paisley, Los Alamos National Lab.

Klaus Sokolowski-Tinten, Univ. Duisburg-Essen (Germany)

Takashi Yabe, Tokyo Institute of Technology (Japan)

SPIE and the organizers gratefully acknowledge **Los Alamos National Laboratory** for its sponsorship of this event.

Daily Schedule and Special Events

Note: All events are located in the Chamisa Ballroom I except as noted below.

Sunday 7 May	Monday 8 May	Tuesday 9 May	Wednesday 10 May	Thursday 11 May	Friday 12 May
Early Registration, Conference Center Lobby, 3:00 to 5:00 pm	Introductory Remarks, 8:30 am	Session 4: Simulations and Alternative Energy Cycles, 8:30 am	Session 7: PLD and Processing of Advanced Materials, 8:30 am	Session 11: Biological Applications, 8:30 am	Session 15: Novel Applications in Physics and Electronics, 8:30 am
Welcome Reception, Chamisa Ballroom II, 6:00 to 8:00 pm	Welcome Address by Governor Bill Richardson (New Mexico), 8:50 am	Session 5: Materials Modification and Processing With Ultrashort Pulses, 10:20 am	Session 8: Advances in Chemical Lasers (COIL, DOIL, EOIL, etc.), 10:45 am	Session 12: High Power Lasers for Ablation, 11:10 am	Closing Remarks, 10:35 am
	Keynote Presentations, 9:15 am	Session 6: Short-Pulse Laser Matter Interaction and New Light Sources, 2:10 pm	Session 9: Electric Discharge and Optically Pumped Gas Lasers, 2:15 pm	Session 13: Scientific and Industrial Applications, 1:45 pm	
	Session 1: Theory and Basic Physics of Laser- Matter Interaction I, 10:55 am	Posters II, Chamisa Ballroom II, 8:00 pm	Session 10: Three- Dimensional Microstructuring, 3:45 pm	Session 14: Laser Ablation Propulsion, 4:00 pm	
	Welcome Luncheon, 12:35 pm		Conference Dinner and Awards, Chamisa Ballroom II, 7:00 pm		
	Session 2: Theory and Basic Physics of Laser- Matter Interaction II, 2:00 pm				
	Session 3: Laser Surface Cleaning, 4:25 pm				
	Posters I, Chamisa Ballroom II, 8:00 pm				

Registration

Conference Center Lobby

Sunday	3:00 am to 5:00 pm
Monday	7:15 am to 4:00 pm
Tuesday	7:15 am to 4:00 pm
Wednesday	7:15 am to 4:00 pm
Thursday	7:15 am to 4:00 pm
Friday	7:15 am to 10:30 am

Sunday Evening Welcome Reception

Chamisa Ballroom II

Sunday	6:00 to 8:00 pm
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A welcome reception for conference attendees will be held Sunday night from 6:00 to 8:00 pm in the Chamisa Ballroom II at the Sagebrush Inn and Convention Center. This reception is included in your registration fee. Guests may accompany a registered attendee for \$60.00 per person. Please pre-register guests.

Monday Luncheon

Chamisa Ballroom II

Monday	12:10 to 2:00 pm
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A complimentary welcome luncheon will be held in the Chamisa Ballroom II on Monday. Attendees should plan to make their own luncheon arrangements on subsequent days.

Poster Session

Chamisa Ballroom II

Monday	8:00 to 10:00 pm
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Attendees are encouraged to view the high-quality papers presented in this interactive format. Authors will be present at their posters to discuss them with session attendees. Light snacks and beverages will be served. All participants are requested to wear their conference badges while attending these sessions.

Poster authors: You may set up your poster after 10:00 am on Monday. Posters must be removed at the end of the session. Posters left on the boards after the session will be discarded.

Wednesday Conference Dinner and Awards

Chamisa Ballroom II

Wednesday	7:00 to 9:00 pm
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This dinner is included in your registration fee. Guests may accompany a registered attendee for \$60.00 per person. Please pre-register guests.

Event of related interest:



**5th International Conference on
Photo-Excited Processes and
Applications (ICPEPA5)**

3-7 September 2006

www.seas.virginia.edu/academic/icpepa5

High-Power Laser Ablation VI

Conference Chair: **Claude R. Phipps**, Photonic Associates

Program Committee: **Sergei I. Anisimov**, L.D. Landau Institute for Theoretical Physics (Russia); **Michel L. Autric**, Univ. de la Méditerranée (France); **Dieter Bäuerle**, Johannes Kepler Univ. Linz (Austria); **Willy L. Bohn**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Boris N. Chichkov**, Laser Zentrum Hannover e.V. (Germany); **Arthur H. Guenther**, The Univ. of New Mexico; **Gordon D. Hager**, Air Force Research Lab.; **Richard F. Haglund, Jr.**, Vanderbilt Univ.; **Victor H. Hasson**, Trex Enterprises; **Manfred Hugenschmidt**, Institut Franco-Allemand de Recherches de Saint-Lo (France); **Andrei A. Ionin**, P.N. Lebedev Physical Institute (Russia); **Michael L. Lander**, Anteon Corp.; **Boris S. Lukyanchuk**, Data Storage Institute (Singapore); **Max M. Michaelis**, Univ. of Natal (South Africa); **Minoru Obara**, Keio Univ. (Japan); **Dennis L. Paisley**, Los Alamos National Lab.; **Klaus Sokolowski-Tinten**, Univ. Duisburg-Essen (Germany); **Takashi Yabe**, Tokyo Institute of Technology (Japan)

Monday 8 May

Introductory Remarks Mon. 8:30 am

Chair: **Claude R. Phipps**, Photonic Associates, LLC

Welcome Address by **Governor Bill Richardson**
(New Mexico) Mon. 8:50 am

Chair: **Claude R. Phipps**, Photonic Associates, LLC

Keynote Presentations Mon. 9:15 to 10:35 am

Chair: **Claude R. Phipps**, Photonic Associates, LLC

9:15 am: **X-ray FELs and high energy density science**, R. W. Lee,
Lawrence Livermore National Lab.[6261-01]

9:55 am: **Intense femtosecond pulse propagation with applications**, J.
V. Moloney, The Univ. of Arizona[6261-02]

Coffee Break 10:35 to 10:55 am

SESSION 1 Mon. 10:55 am to 12:35 pm

Theory and Basic Physics of Laser-Matter Interaction I

Chair: **Boris S. Lukyanchuk**, Data Storage Institute (Singapore)

10:55 am: **Bulk models for laser ablation of polymers (Invited Paper)**,
N. M. Bityurin, Institute of Applied Physics (Russia)[6261-03]

11:20 am: **Development and application of UV excimer lamps from
354nm -126nm (Invited Paper)**, I. W. Boyd, Univ. College London (United
Kingdom)[6261-139]

11:45 am: **Single pulse ultrafast dynamic ellipsometry (Invited Paper)**,
D. S. Moore, S. D. McGrane, D. J. Funk II, Los Alamos National
Lab.[6261-04]

12:10 pm: **Gold wall ablation and hohlraum filling measurements of
vacuum and gas-filled hohlraums (Invited Paper)**, T. E. Tierney IV, J. A.
Cobble, B. G. DeVolder, N. M. Hoffman, D. A. Tubbs, D. L. Paisley, Los
Alamos National Lab.[6261-140]

Welcome Luncheon 12:35 to 2:00 pm
Chamisa Ballroom II

SESSION 2 Mon. 2:00 to 4:05 pm

Theory and Basic Physics of Laser-Matter Interaction II

Chair: **Boris S. Lukyanchuk**, Data Storage Institute (Singapore)

2:00 pm: **On ultra-short laser induced instabilities at the surface of
non-metallic solids (Invited Paper)**, F. A. Costache, Brandenburgische
Technische Univ. Cottbus (Germany) and IHP/BTU JointLab Cottbus
(Germany); J. Reif, Brandenburgische Technische Univ. Cottbus
(Germany)[6261-07]

2:25 pm: **Fundamental issues of sub-threshold material removal by
laser irradiation (Invited Paper)**, J. T. Dickinson, Washington State
Univ.[6261-08]

2:50 pm: **Different regimes of viscous melt flow in laser ablation
(Invited Paper)**, V. N. Tokarev, General Physics Institute (Russia); S.
Lazare, Univ. Bordeaux I (France); A. F. H. Kaplan, Luleå Univ. of
Technology (Sweden)[6261-09]

3:15 pm: **Extension of the process limits in material processing with
femtosecond laser radiation by means of high-speed pump-probe
photography (Invited Paper)**, I. Mingareev, A. Horn, E. W. Kreutz, RWTH-
Aachen (Germany)[6261-10]

3:40 pm: **Langmuir probe study of laser ablation plume dynamics
(Invited Paper)**, J. G. Lunney, The Univ. of Dublin, Trinity College
(Ireland)[6261-11]

Coffee Break 4:05 to 4:25 pm

SESSION 3 Mon. 4:25 to 5:35 pm

Laser Surface Cleaning

Chair: **Boris S. Lukyanchuk**, Data Storage Institute (Singapore)

4:25 pm: **Dynamics of particle ejection in dry laser cleaning (Invited
Paper)**, D. Grojo, A. Cros, P. Delaporte, M. Sentis, Univ. de la Méditerranée
(France)[6261-12]

4:50 pm: **Advanced dry and steam laser cleaning of opaque and
transparent critical substrates**, S. I. Kudryashov, S. Shukla, K. Lyon, S.
D. Allen, Arkansas State Univ.[6261-13]

5:05 pm: **Absorption waves produced by CO₂ laser ablation**, H. Eckel, J.
Tegel, W. Schall, Deutsches Zentrum für Luft und Raumfahrt e.V.
(Germany)[6261-14]

5:20 pm: **Nanoparticle adhesion and removal studied by pulsed laser
irradiation (Invited Paper)**, P. A. Leiderer, Univ. Konstanz
(Germany)[6261-15]

✓ **Posters-Monday**

Chair: **Arthur H. Guenther**, *The Univ. of New Mexico*

Attendees are encouraged to view the high quality papers presented in this interactive format. Authors will be present at their posters from 8:00 to 10:00 pm in the Chamisa Ballroom II, to discuss them with session attendees. Light snacks and beverages will be served. All participants are requested to wear their conference badges while attending these sessions.

Poster authors: You may set up your poster after 10:00 am Monday. Posters must be removed at the end of each session. Posters left on the boards after the sessions will be discarded.

- ✓ **Effects of non-equilibrium energy distribution of surface atoms on the onset and rate of laser ablation: experiments and theory**, E. G. Gamaly, N. R. Madsen, A. V. Rode, V. Z. Kolev, B. Luther-Davies, The Australian National Univ. (Australia) [6261-06]
- ✓ **Experimental study of front and back ablation of metal thin film using ultrashort laser pulses**, A. B. Alloncle, R. Bouffaron, J. Herman, M. L. Sentis, Lab. Lasers, Plasmas et Procédés Photoniques (France) [6261-39]
- ✓ **Full-Heusler Co-based alloys grown by pulsed laser ablation: structural, optical, and magnetic characterizations**, M. L. Autric, E. Valerio, Univ. de la Méditerranée (France); F. Guinneton, Univ. de Provence (France); C. E. A. Grigorescu, National Institute of Research & Development for Optoelectronics (Romania); L. F. Cohen, Imperial College London (United Kingdom) [6261-40]
- ✓ **Ablation of nonlinear-force driven plasma bocks for fast igniter operation (Invited Paper)**, G. H. Miley, Univ. of Illinois at Urbana-Champaign; J. Badziak, S. Glowacz, S. Jablonski, Instytut Fizyki Plazmy i Laserowej Mikrosyntezy (Poland); H. Hora, Univ. of New South Wales (Australia); P. X. Hammerling, Quantum Resonance Inc. [6261-69]
- ✓ **Mitigation of laser damage growth in fused silica NIF optics with a galvanometer scanned CO₂ laser**, I. L. Bass, G. M. Guss, R. P. Hackel, Lawrence Livermore National Lab. [6261-81]
- ✓ **Nanostructured coatings of metal-incorporated amorphous carbon deposited by femtosecond pulsed laser deposition: correlation with plasma plume diagnostics**, N. Benchikh, F. Garrelie, C. Donnet, Univ. Jean Monnet Saint-Etienne (France); K. Wolski, École Nationale Supérieure des Mines de Saint-Étienne (France); F. Rogemond, Univ. Jean Monnet Saint-Etienne (France) [6261-82]
- ✓ **Improved throughput of deep high-aspect-ratio trenches using split-beam laser ablation**, D. M. Braun, Hewlett-Packard Co.; J. Gu, Hewlett Packard Singapore (Pte) Ltd. (Singapore); R. J. Oram, Hewlett-Packard Co. [6261-84]
- ✓ **An analysis of ultrashort pulse laser micromachining parameters for the optimization of shallow hole drilling**, B. R. Campbell, V. V. Semak, The Pennsylvania State Univ. [6261-85]
- ✓ **Estimation of laser system pointing: an introduction to RHINO (real-time histogram interpretation of numerical observations)**, S. M. Chandler, G. W. Lukesh, Nukove Scientific Consulting, LLC .. [6261-86]
- ✓ **High power laser interaction effects with metallic pressure vessel**, N. Das, D. Mukherji, R. Kumar, Laser Science and Technology Ctr. (India); M. Hushain, Z. H. Zaidi, Jamia Milia Islamia Univ. (India); A. Kumar, Laser Science and Technology Ctr. (India) [6261-87]
- ✓ **Hybrid resonator configurations for COIL**, F. Duschek, J. Handke, T. Hall, K. M. Grünewald, DLR (Germany) [6261-89]
- ✓ **Coupling model of FDTD and CIP schemes for laser-induced ignition and breakdown of mixture gas**, X. Fang, Z. Duan, Institute of Mechanics (China); S. Xu, Univ. of Science and Technology of China (China) [6261-90]
- ✓ **Ablation cleaning techniques for high-power short-pulse laser-produced heavy ion targets**, K. Flippo, B. M. Hegelich, M. J. Shmitt, C. A. Mersevole, G. L. Fisher, J. A. Cobble, D. C. Gautier, R. B. Gibson, R. P. Johnson, S. A. Letzring, J. C. Fernández, Los Alamos National Lab. [6261-91]
- ✓ **Healing of calvarial wounds from ultrafast laser irradiation with and without the use of growth factors**, B. Girard, K. Franjic, M. Cloutier, D. J. Wilson, C. M. L. Clokie, B. C. Wilson, D. R. J. Miller, Univ. of Toronto (Canada) [6261-93]
- ✓ **Cold ablation of ceramic substrates with an IR laser**, D. R. Hall, Heriot-Watt Univ. (United Kingdom); H. J. Baker, K. M. Nowak, Heriot Watt Univ. (United Kingdom) [6261-94]
- ✓ **Pulsed femtosecond laser-target momentum coupling in the high-intensity regime**, P. X. Hammerling, Quantum Resonance Inc.; J. L. Remo, Harvard-Smithsonian Ctr. for Astrophysics [6261-95]
- ✓ **Combustion-augmented laser-ramjets**, H. Horisawa, K. Tamada, Tokai Univ. (Japan); I. Kimura, Univ. of Tokyo (Japan) [6261-96]
- ✓ **Protein structural failure in mid-IR laser ablation of cornea**, M. S. Hutson, Y. Xiao, Vanderbilt Univ. [6261-97]
- ✓ **Absorption waves interaction in gas and plasma**, A. A. Il'in, O. A. Bukin, I. G. Nagorniy, A. N. Pavlov, A. V. Bulanov, V.I. Il'ichev Pacific Oceanological Institute (Russia) [6261-98]
- ✓ **Laser propulsion of microelectronic components: releasing mechanisms investigation**, N. S. Karlitskaya, M. Johan, Univ. of Twente (Netherlands); F. de Lange, Netherlands Institute for etals Research (Netherlands) and Univ. of Twente (Netherlands); H. Kettelarij, Philips Applied Technologies (Netherlands) [6261-101]
- ✓ **Terahertz-frequency electrical conductivity measurements of ultrashort laser-ablated plasmas**, K. Kim, B. Yellampelle, J. H. Glowina, A. J. Taylor, G. D. Rodriguez, Los Alamos National Lab. [6261-102]
- ✓ **Laser heating of carbon nanoparticles in tissue results in antitumor effect**, B. Y. Kogan, Organic Intermediates and Dyes Institute (Russia); R. Yakubovskaya, A. Pankratov, T. Andreeva, P. A. Herten Moscow Research Oncological Institute (Russia); L. Kvacheva, A.N. Nesmeyanov Institute of Organoelement Compounds (Russia); A. Titov, N. N. Semenov Institute of Chemical Physics (Russia); G. N. Vorozhtsov, Organic Intermediates and Dyes Institute (Russia) [6261-103]
- ✓ **Microsphere array manipulation using femtosecond laser pulses**, Y. Nishizawa, H. Takada, M. Obara, Keio Univ. (Japan) [6261-104]
- ✓ **Scaling properties of dissipative structures formed on the nanolevel in metals under the action of ultra-short pulses of laser radiation in subnanosecond longevity range**, A. S. Konkin, A. Y. Uchaev, R. I. Il'kaev, V. T. Punin, A. P. Morovov, N. I. Selchenkova, N. A. Yukina, RFNC-VNIIEF (Russia) [6261-105]
- ✓ **Laser-induced cavitation and explosive boiling in superheated liquids: a new GHz probe**, S. I. Kudryashov, S. D. Allen, K. Lyon, Arkansas State Univ. [6261-108]
- ✓ **Effects of liquid propellant surface and laser irradiation on laser propulsion with TEA CO₂ laser**, J. Lin, V. Mukundarajan, J. E. Sinko, L. Kodgis, S. B. Porter, A. V. Pakhomov, The Univ. of Alabama in Huntsville; L. N. Myrabo, Rensselaer Polytechnic Institute [6261-114]
- ✓ **Methodical investigations for increasing the process capability of high level precision laser short pulse ablation in die and mould industry**, A. Lorenz, C. Emmelmann, Technische Univ. Hamburg-Harburg (Germany) [6261-115]
- ✓ **A decrease in the damage threshold in dielectric materials induced by negatively chirped laser pulses**, E. H. Louzon, Soreq Nuclear Research Ctr. (Israel); A. Zigler, The Hebrew Univ. of Jerusalem (Israel); Z. Henis, D. Fisher, S. Pecker, Y. Ehrlich, M. Fraenkel, Soreq Nuclear Research Ctr. (Israel) [6261-117]
- ✓ **Densification mechanism in silica glass and impact of nanoparticles: implications to damage to optics**, S. Luo, Los Alamos National Lab.; L. Zheng, Univ. of Missouri-Columbia; Q. An, Univ. of Science and Technology of China (China) [6261-118]
- ✓ **TOF MS studies related to synthesis of the BN and carbon nano-structured materials using the laser ablation technology (YAG-laser, λ_{exc} = 1064 nm)**, V. I. Makarov, D. Huang, A. Hidalgo, G. Morelli, B. R. Weiner, Univ. of Puerto Rico [6261-119]

- ✓ **Temperature tuned epitaxy for low-temperature synthesis of semiconductor oxides**, T. Okato, M. Obara, Keio Univ. (Japan); M. J. Kappers, M. G. Blamire, Univ. of Cambridge (United Kingdom) [6261-121]
- ✓ **Optical effect of Methylamine intercalation in lead iodide**, S. Sharifi, Univ. degli Studi di Pisa (Italy) [6261-125]
- ✓ **Time-resolved force and ICCD imaging study of TEA CO₂ laser ablation of ice and water**, J. E. Sinko, J. Lassiter, V. Mukundarajan, L. Kodgis, S. B. Porter, J. Lin, A. V. Pakhomov, The Univ. of Alabama in Huntsville; L. N. Myrabo, Rensselaer Polytechnic Institute .. [6261-127]
- ✓ **Refractive-index increase in laser-written waveguides in fused silica**, A. M. Streltsov, C. W. Ponader, J. Schroeder III, Corning Inc. [6261-128]
- ✓ **Gene transfer of human hepatocyte growth factor by the use of nanosecond pulsed laser-induced stress waves**, M. Terakawa, Keio Univ. (Japan); S. Sato, D. Saitoh, H. Ashida, National Defense Medical College (Japan); H. Okano, Keio Univ. School of Medicine (Japan); M. Obara, Keio Univ. (Japan) [6261-129]
- ✓ **Use of laser ablation for cleaning of railway wheelset**, A. M. Yastrebkov, A. Z. Venediktov, M. M. Zarubin, S. A. Yastrebkova, Agroel Scientific Production Co. (Russia) [6261-130]
- ✓ **Laser annealing of implanted silicon carbide and Raman characterization**, I. Zergioti, National Technical Univ. of Athens (Greece); K. Zekentes, Foundation for Research and Technology-Hellas (Greece); A. G. Kontos, Y. S. Raptis, National Technical Univ. of Athens (Greece) [6261-132]
- ✓ **VUV and UV excilamps**, V. F. Tarasenko, M. I. Lomaev, E. A. Sosnin, V. S. Skakun, D. V. Shitz, M. V. Erofeev, S. M. Avdeev, Institute of High Current Electronics (Russia) [6261-134]
- ✓ **Lasers pumped by the generators with inductive energy storage**, V. F. Tarasenko, A. N. Panchenko, A. E. Tel'minov, Institute of High Current Electronics (Russia) [6261-135]
- ✓ **Dynamics of particles removal in laser shock cleaning**, P. Zhang, B. Bian, Z. Li, Nanjing Univ. of Science & Technology (China) .. [6261-137]
- ✓ **Electronic contribution for refractive indices material liquid crystal display by compensation film thickness**, C. Chang, Consultant (Taiwan); W. Chen, Z. Win, Consultant [6261-138]

Tuesday 9 May

SESSION 4 Tues. 8:30 to 10:00 am

Simulations and Alternative Energy Cycles

Chair: Takashi Yabe, Tokyo Institute of Technology (Japan)

- 8:30 am: **Simulation of fast laser-induced melting and solidification in Si and GaAs (Invited Paper)**, E. I. Gatskevich, G. D. Ivlev, Institute of Electronics (Belarus); P. Prikryl, Mathematical Institute (Czech Republic) [6261-16]
- 8:55 am: **Characterization of MgO desorption by laser pulses**, M. Tsuji, S. Uchida, T. Yabe, Y. Ogata, K. Ikuta, Tokyo Institute of Technology (Japan) [6261-17]
- 9:10 am: **Development of solar pumped solid state lasers (Invited Paper)**, S. Uchida, T. Yabe, K. Yoshida, A. Ikesue, I. Kajiwara, M. Yoshida, Y. Sato, T. Okubo, Tokyo Institute of Technology (Japan) [6261-18]
- 9:35 am: **Ionization of wide band-gap materials by high-power laser radiation (Invited Paper)**, V. E. Gruzdev, J. K. Chen, Univ. of Missouri/Columbia [6261-19]
- Coffee Break 10:00 to 10:20 am

SESSION 5 Tues. 10:20 am to 12:10 pm

Materials Modification and Processing with Ultrashort Pulses

Chair: Richard F. Haglund, Jr., Vanderbilt Univ.

- 10:20 am: **Fabrication of custom micro-optics for diode stack beam correction (Invited Paper)**, D. R. Hall, H. J. Baker, K. M. Nowak, F. J. Monjardin, Heriot Watt Univ. (United Kingdom); R. McBride, PowerPhotonic Ltd. (United Kingdom) [6261-61]
- 10:45 am: **New trends in femtosecond pulsed laser deposition and femtosecond produced plasma diagnostics (Invited Paper)**, F. Garrelie, Univ. Jean Monnet Saint-Etienne (France) [6261-21]
- 11:10 am: **Expansion-limited nanocluster formation through the action of a single laser pulse**, N. R. Madsen, E. G. Gamaly, A. V. Rode, B. Luther-Davies, The Australian National Univ. (Australia) [6261-22]
- 11:25 am: **Reflectivity oscillations from fs-laser excited Bismuth: interplay between the lattice and the electronic response**, A. V. Rode, The Australian National Univ. (Australia) [6261-23]
- 11:40 am: **Topographic imaging and velocity measurements of surface expansion during laser ablation of a metal layer on glass**, G. Rodriguez, A. R. Valenzuela, S. A. Clarke, K. A. Thomas, Los Alamos National Lab. [6261-24]
- 11:55 am: **Ultrafast ablation of solids using a femtosecond VUV free electron laser**, K. Sokolowski-Tinten, N. Stojanovic, D. von der Linde, Univ. Duisburg-Essen (Germany); U. Zastra, F. Perner, E. Förster, Friedrich-Schiller-Univ. Jena (Germany); R. Sobierajski, R. Nietubyc, M. Jurek, J. Krzywinski, Instytut Fizyki (Poland); L. Juha, Instytut Fizyki (Czech Republic); J. Cihelka, A. Velyhan, Academy of Sciences of the Czech Republic (Czech Republic); J. Kuba, Czech Technical Univ. (Czech Republic); J. Chalupský, Charles Univ. in Prague (Czech Republic); T. Tschentscher, S. Toleikis, Deutsches Elektronen-Synchrotron (Germany) [6261-25]
- Lunch Break 12:10 to 2:10 pm

SESSION 6 Tues. 2:10 to 5:30 pm

Short-Pulse Laser Matter Interaction and New Light Sources

Chair: Klaus Sokolowski-Tinten, Friedrich-Schiller-Univ. Jena (Germany)

- 2:10 pm: **Femtosecond x-ray diffraction studies of laser driven melting at SLAC (Invited Paper)**, K. J. Gaffney, Stanford Synchrotron Radiation Laboratory [6261-26]
- 2:35 pm: **Theoretical description of laser induced ultrafast phase transitions in solids and nanostructures (Invited Paper)**, M. E. Garcia, Univ. Kassel (Germany) [6261-27]
- 3:00 pm: **Free-electron generation in laser-irradiated dielectrics (Invited Paper)**, B. Rethfeld, Univ. Kaiserslautern (Germany) ... [6261-28]
- 3:25 pm: **Picosecond x-ray diffraction studies of shocked single crystals (Invited Paper)**, J. Wark, Univ. of Oxford [6261-29]
- 3:50 pm: **Time-resolved diffraction profiles and atomic dynamics in short pulse laser induced structural transformations: molecular dynamics study (Invited Paper)**, L. V. Zhigilei, Z. Lin, C. A. Sevilla, Univ. of Virginia [6261-30]
- Coffee Break 4:15 to 4:35 pm
- 4:35 pm: **Mechanism of resonant infrared polymer ablation**, R. F. Haglund, Jr., R. J. Belmont, Vanderbilt Univ.; D. M. Bubb, Rutgers Univ.; N. L. Dygert, S. L. Johnson, Jr., K. E. Schriver, Vanderbilt Univ. [6261-31]
- 4:50 pm: **Laser produced x-ray by high brightness and power diode pumped Nd:YAG laser for compact x-ray lithography and microscopy**, H. Rieger, JMAR Technologies, Inc. [6261-33]
- 5:05 pm: **Non-equilibrium transformations of solids induced by femtosecond laser pulses (Invited Paper)**, E. G. Gamaly, O. P. Uteza, A. V. Rode, M. J. Samoc, B. Luther-Davies, The Australian National Univ. (Australia) [6261-34]

Wednesday 10 May

SESSION 7 Wed. 8:30 to 10:10 am

PLD and Processing of Advanced Materials

Chair: Minoru Obara, Keio Univ. (Japan)

8:30 am: **Epitaxial ZrC and LaB6 thin films grown by pulsed laser deposition (Invited Paper)**, V. Craciun, J. Woo, K. Siebein, G. Bourne, Univ. of Florida; D. Craciun, NILPRP; R. K. Singh, Univ. of Florida [6261-35]

8:55 am: **Soft matter processing by matrix assisted pulsed laser evaporation (Invited Paper)**, M. Dinescu, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); D. B. Chrisey, Naval Research Lab.; T. Lippert, M. Nagel, Paul Scherrer Institut (Switzerland) . . . [6261-36]

9:20 am: **Optimization of structural modifications induced in laser-excited bulk transparent materials (Invited Paper)**, R. Stoian, A. Mermilod-Blondin, N. Sanner, E. Audouard, Univ. Jean Monnet Saint-Etienne (France); A. Rosenfeld, M. Boyle, A. Husakou, I. V. Hertel, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); I. M. Burakov, N. M. Bulgakova, Institute of Thermophysics (Russia)[6261-37]

9:45 am: **Laser-induced plasma-assisted ablation (LIPAA): fundamentals and industrial applications (Invited Paper)**, K. Sugioka, Y. Hanada, K. Midorikawa, The Institute of Physical and Chemical Research (Japan) [6261-38]

Coffee Break 10:10 to 10:30 am

SESSION 8 Wed. 10:45 am to 12:50 pm

Scientific and Industrial Applications

Chair: Manfred Hugenschmidt, Institut Franco-Allemand de Recherches de Saint-Lo (France)

10:45 am: **'Impulsar': experimental and theoretical investigations (Invited Paper)**, V. V. Apollonov, V. N. Tishchenko, General Physics Institute (Russia) [6261-41]

11:10 am: **Picosecond UV-laser processing of graphite-like boron nitride (Invited Paper)**, A. V. Kanaev, L. Museur, J. Petit, Univ. Paris XIII (France); W. I. Marine, Ctr. de Recherche en Matière Condensée et Nanosciences (France); V. L. Solozhenko, Univ. Paris XIII (France); D. Anglos, Institute of Electronic Structure and Laser of the Foundation for Research and Technology-Hellas (Greece) [6261-42]

11:35 am: **Polymers as fuel for laser plasma thrusters (Invited Paper)**, T. Lippert, L. Urech, A. J. Wokaun, Paul Scherrer Institut (Switzerland); C. R. Phipps, Photonic Associates, LLC [6261-43]

12:00 pm: **Non-solid, non-rigid, gas or flame optics for high average power laser systems (Invited Paper)**, M. M. Michaelis, Univ. of Kwa-Zulu-Natal (South Africa) [6261-44]

12:25 pm: **Superpower volume discharges initiated by avalanche e-beam and their application for creation lasers and excilamps (Invited Paper)**, V. F. Tarasenko, Institute of High Current Electronics (Russia) [6261-133]

Lunch Break 12:50 to 2:15 pm

SESSION 9 Wed. 2:15 to 3:25 pm

Electric Discharge and Optically Pumped Gas Lasers

Chair: Andrey A. Ionin, P.N. Lebedev Physical Institute (Russia)

2:15 pm: **Singlet delta oxygen in a slab discharge (Invited Paper)**, A. A. Ionin, M. P. Frolov, V. N. Ochkin, Y. Podmar'kov, S. Y. Savinov, L. V. Seleznev, D. V. Sinityn, N. P. Vagin, N. N. Yuryshv, P.N. Lebedev Physical Institute (Russia); I. V. Kochetov, A. P. Napartovich, O. Rulev, Troitsk Institute for Innovation and Fusion Research (Russia) [6261-45]

2:40 pm: **Terawatt CO² laser: a new tool for strong-field research (Invited Paper)**, I. V. Pogorelsky, Brookhaven National Lab. [6261-46]

2:55 pm: **UV- and VUV-gas-discharge-lasers with high average radiation power on the chemical stability molecules**, B. A. Kozlov, A. J. Payurov, V. S. Trusov, E. V. Bulaeva, A. A. Bykov, Radio-Engineering Academy (Russia) [6261-47]

3:10 pm: **Amplification of femtosecond optical pulses in a photolytically driven XeF(C-A) laser amplifier**, V. I. Tcheremiskine, O. P. Uteza, M. L. Sentis, Univ. de la Méditerranée (France); V. V. Mislavsky, Lab. of Photochemical Processes, P.N. Lebedev Physical Institute (Russia); L. D. Mikheev, Lab. of Photochemical Processes, P.N. Lebedev Physical Institute (France) [6261-49]

Coffee Break 3:25 to 3:45 pm

SESSION 10 Wed. 3:45 to 5:30 pm

Three-Dimensional Microstructuring

Chair: Boris N. Chichkov, Laser Zentrum Hannover e.V. (Germany)

3:45 pm: **Novel photonic devices fabrication using femtosecond laser micromachining (Invited Paper)**, M. Kamata, M. Obara, Keio Univ. (Japan) [6261-50]

4:10 pm: **Femtosecond modification of titanium oxide gel in filamentation regime (Invited Paper)**, A. Kuznetsov, Institute of Applied Physics (Russia) and Univ. Paris XIII (France); A. V. Kanaev, Univ. Paris XIII (France); N. M. Bityurin, Institute of Applied Physics (Russia) . . . [6261-51]

4:50 pm: **Synthesis of non-toxic nanomaterials by femtosecond laser ablation in aqueous solutions**, A. V. Kabashin, M. Meunier, S. Besner, P. M. Boyer, École Polytechnique de Montréal (Canada) [6261-53]

5:05 pm: **Advanced laser micromachining processes for MEMS applications (Invited Paper)**, A. S. Holmes, J. E. A. Pedder, Imperial College London (United Kingdom); K. L. Boehlen, Exitech Ltd. (United Kingdom) [6261-136]

5:30 pm: **High speed direct laser cutting of micro structures with submicron details**, K. L. Boehlen, N. Sykes, C. Lefevre, Exitech Ltd. (United Kingdom) [6261-83]

Conference Dinner and Awards Wed. 7:00 pm
Chamisa Ballroom II

Thursday 11 May

SESSION 11 Thurs. 8:30 to 10:50 am

Biological Applications*Chair: Victor H. Hasson, Trex Enterprises*

- 8:30 am: **Laser processing of living constructs: how can we leverage Nature's directed self-assembly?** (*Invited Paper*), D. B. Chrisey, North Dakota State Univ.[6261-55]
- 8:55 am: **Photochemical surface modification of polymers for biomedical applications** (*Invited Paper*), J. Heitz, Johannes Kepler Univ. Linz (Austria)[6261-56]
- 9:20 am: **In vivo manipulation of biological systems with femtosecond laser pulses** (*Invited Paper*), C. B. Schaffer, Cornell Univ.[6261-57]
- 9:45 am: **Novel aspects of materials processing by ultrafast lasers: from photonic to biological applications** (*Invited Paper*), I. Zergioti, National Technical Univ. of Athens (Greece) and Foundation for Research and Technology Hellas (Greece)[6261-58]
- 10:10 am: **Submicro foaming in biopolymers by UV pulsed laser irradiation**, M. Castillejo, M. Oujja, E. Rebollar, Spanish Council for Scientific Research (Spain); C. Abrusci, Univ. Complutense de Madrid (Spain); F. Catalina, Spanish Council for Scientific Research (Spain); S. Lazare, Univ. Bordeaux I (France)[6261-59]
- 10:25 am: **Dental applications of ultra-short laser pulses - a new approach for painless treatment?**, E. Wintner, Technische Univ. Wien (Austria)[6261-141]
- Coffee Break 10:50 to 11:10 am

SESSION 12 Thurs. 11:10 am to 12:15 pm

High Power Lasers for Ablation*Chair: Michael L. Lander, Anteon Corp.*

- 11:10 am: **Megawatt peak-power pulsed fiber sources** (*Invited Paper*), F. Di Teodoro, Aculight Corp.[6261-60]
- 11:35 am: **High power electric supersonic flow lasers** (*Invited Paper*), J. W. Rich, I. Adamovich, The Ohio State Univ.[6261-62]
- 12:00 pm: **Recent development and potential of high power fiber lasers**, D. V. Gapontsev, IPG Photonics Corp.[6261-63]
- Lunch Break 12:15 to 1:45 pm

SESSION 13 Thurs. 1:45 to 3:40 pm

Advances in Chemical Lasers (COIL, DOIL, EOIL, etc.)*Chair: Gordon D. Hager, Air Force Research Lab.*

- 1:45 pm: **Progress toward a KW-scale electric oxygen iodine laser** (*Invited Paper*), A. E. Hill, Plasmatronics, Inc. and Texas A&M Univ.[6261-64]
- 2:10 pm: **Important kinetic effects in the hybrid ElectricOIL system** (*Invited Paper*), J. W. Zimmerman, D. M. King, A. D. Palla, J. T. Verdeyen, D. L. Carroll, J. K. Laystrom, G. F. Benavides, CU Aerospace LLC; W. C. Solomon, Univ. of Illinois at Urbana-Champaign[6261-65]
- 2:35 pm: **Development of advanced generator of singlet oxygen for a COIL** (*Invited Paper*), J. Kodymova, O. Špalek, Institute of Physics, Academy of Sciences (Czech Republic); J. Hrubý, Institute of Thermomechanics, Academy of Sciences (Czech Republic); V. Jirásek, M. Čenský, Institute of Physics, Academy of Sciences (Czech Republic)[6261-66]
- 3:00 pm: **Chemical oxygen-iodine laser with atomic iodine generated in a separate reactor**, O. Špalek, Institute of Physics (Czech Republic); V. Jirásek, Institute of Physics (Czech Republic); M. Čenský, J. Kodymová, Institute of Physics (Czech Republic); I. Jakubec, Institute of Inorganic Chemistry (Czech Republic)[6261-67]
- 3:15 pm: **Performance of high pressure COIL with centrifugal bubble singlet oxygen generator** (*Invited Paper*), M. V. Zagidullin, V. D. Nikolaev, M. I. Svistun, N. A. Khvatov, P.N. Lebedev Physical Institute (Russia)[6261-131]
- Coffee Break 3:40 to 4:00 pm

SESSION 14 Thurs. 4:00 to 5:45 pm

Laser Ablation Propulsion*Chair: Claude R. Phipps, Photonic Associates, LLC*

- 4:00 pm: **The ALP-PALS Project: optimal coupling for laser propulsion** (*Invited Paper*), F. P. Boody, Ion Light Technologies GmbH (Germany); J. Badziak, Instytut Fizyki Plazmy i Laserowej Mikrosyntezy (Poland); H. Eckel, Deutsches Zentrum für Luft und Raumfahrt (Germany); S. Gammino, Istituto Nazionale Di Fisica Nucleare (Italy); J. Krása, L. Láška, Instytut Fizyki (Czech Republic); A. Mezzasalma, Univ. degli Studi di Messina (Italy); A. V. Pakhomov, The Univ. of Alabama in Huntsville; P. Parys, Instytut Fizyki Plazmy i Laserowej Mikrosyntezy (Poland); M. Pfeifer, Instytut Fizyki (Czech Republic); T. Pisarczyk, Instytut Fizyki Plazmy i Laserowej Mikrosyntezy (Poland); K. Rohlena, Instytut Fizyki (Czech Republic); W. O. Schall, Deutsches Zentrum für Luft und Raumfahrt (Germany); L. Torrisi, Univ. degli Studi di Messina (Italy) and Istituto Nazionale Di Fisica Nucleare (Italy); J. Wołowski, Instytut Fizyki Plazmy i Laserowej Mikrosyntezy (Poland)[6261-68]
- 4:25 pm: **Towards closing the momentum budget: an analysis of force generation in vaporization-mode TEA CO₂ laser ablation of liquids** (*Invited Paper*), J. E. Sinko, L. Kodgis, S. Porter, J. Lin, A. V. Pakhomov, The Univ. of Alabama in Huntsville; C. W. Larson, F. B. Mead, Jr., Air Force Research Lab.[6261-71]
- 4:50 pm: **Laser-electrostatic hybrid acceleration for high-specific-impulse propulsion systems**, H. Horisawa, Y. Uchida, S. Kino, Tokai Univ. (Japan); I. Kimura, Univ. of Tokyo (Japan)[6261-72]
- 5:05 pm: **Confined plasma ablation for shock physics, plate launch, and material dynamics**, D. L. Paisley, Los Alamos National Lab. [6261-73]
- 5:20 pm: **Flight dynamics simulation of lightcraft propelled by laser ablation** (*Invited Paper*), C. Ballard, K. S. Anderson, L. N. Myrabo, Rensselaer Polytechnic Institute[6261-74]

Friday 12 May

SESSION 15 Fri. 8:30 to 10:35 am

Novel Applications in Physics and Electronics

Chair: Michel L. Autric, Univ. de la Méditerranée (France)

8:30 am: **Femtosecond laser beam in interaction with materials for thin film deposition (Invited Paper)**, C. M. Boulmer-Leborgne, R. Benzerga, Univ. d'Orléans (France); J. Perrière, Univ. Paris 7-Denis Diderot (France)[6261-76]

8:55 am: **Low-temperature pulsed laser deposition: a successful method of obtaining good quality NiMnSb thin films for spintronic applications (Invited Paper)**, J. Giapintzakis, Univ. of Cyprus (Cyprus) and Institute of Electronic Structure and Laser of the Foundation for Research and Technology-Hellas (Greece); S. Gardelis, National Ctr. for Scientific Research (Greece); E. Papadopoulou, Z. Viskadourakis, Institute of Electronic Structure and Laser of the Foundation for Research and Technology-Hellas (Greece)[6261-77]

9:20 am: **Coupled photo-thermal and time resolved reflectivity methods to original investigation of laser/material nanosecond interaction (Invited Paper)**, N. Semmar, Univ. d'Orléans (France); J. Martan, O. E. Cibulka, Univ. of West Bohemia (Czech Republic); E. Le Menn, C. M. Boulmer-Leborgne, Univ. d'Orléans (France)[6261-78]

9:45 am: **Application of plasma monitoring methods to the optimized design of laser shock processing applications (Invited Paper)**, J. L. Ocaña, C. L. Molpeceres, M. Morales, O. Benito, J. A. Porro, Univ. Politécnica de Madrid (Spain)[6261-79]

10:10 am: **Acceleration history in laser-ablative impulse measured using velocity interferometer (VISAR) (Invited Paper)**, K. Mori, A. Kohei, A. Sasoh, Tohoku Univ. (Japan); E. Zaretsky, Ben-Gurion Univ. of the Negev (Israel)[6261-80]

Closing Remarks Fri. 10:35 am

Chair: Claude R. Phipps, Photonic Associates, LLC

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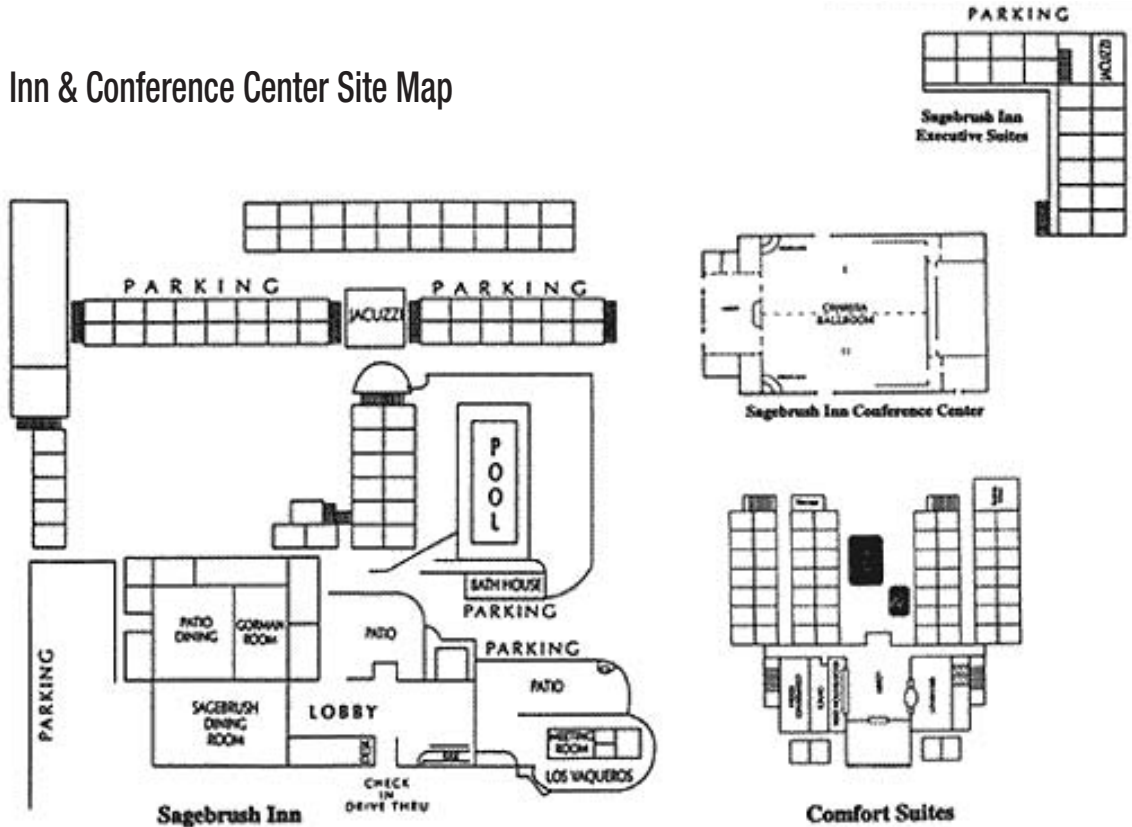
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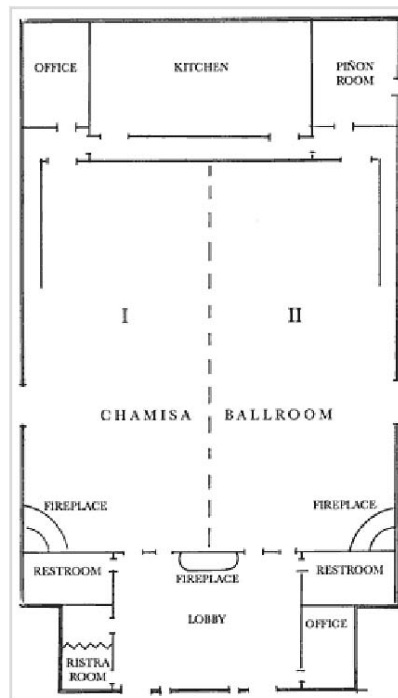


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