

January 24 - January 28, 2006, Moscow, Russia



**Third International Workshop on
MATHEMATICAL MODELS & MODELING
IN LASER-PLASMA PROCESSES**

WORKSHOP Chairs

PROF. DR. SC. NAT. VLADIMIR I. MAZHUKIN

Russian Academy of Sciences
Institute for Mathematical Modeling,
Moscow Humanitarian University

**Workshop is supported by
Science and Engineering Commission of
Moscow Municipal Duma
Prokhorov Institute of General Physics RAS
Production Company "FREGAT", Moscow**

Dear colleagues!

Laboratory of Mathematical Modeling of Moscow Humanitarian University and Institute for Mathematical Modeling of Russian Academy of Sciences are holding the second meeting of International Workshop, which is supposed to be held on regular basis.

The main objectives of the Workshop are:

1. Critical analysis of mathematical models and modeling results obtained in recent years in a rapidly growing and advancing domain of highly non-equilibrium laser-plasma processes.
2. Discussion and analysis of applied and developed software.
3. Discussion of experimental investigations demonstrating the necessity of the usage of methods of mathematical modeling.

We suggest you to take part in the Workshop and make a communication in the form of report in one of the following directions:

Mathematical models and modeling.

Development and application of software.

Experimental investigations and diagnostics.

Registration fee: — 200 €(including lunch everyday).

Chairman of Workshop:

Prof. Dr. sc. nat. Vladimir I. Mazhukin



GENERAL INFORMATION

WORKSHOP VENUE

The LPpM³ -II
Workshop will be held from January 24 till January 28,
2006
at the Moscow Humanitarian University
Unosty, 5/1, Moscow, Russia
Tel: (095) 374-7086

ARRIVAL

Members of the Organizing Committee will meet the participants at Sheremetievo-2 airport on January 24. Transportation for foreign participants will be provided from the airport to the place of registration. To ensure that you will be met please inform the Organizing Committee

1. report at a conference title,
 2. copy of the passport first page,
 3. conditions your accommodation,
 4. the exact time and place of your arrival in Moscow
- at the latest December 1 2005 by **e-mail:** immras@orc.ru, **Fax:** (095) 374-7086

REGISTRATION

Registration will take place at the Moscow Humanitarian University, Unosty st. 5/1, tel. (095) 374-7086. The place of registration can be reached from Moscow by subway to Vyhino station and then by bus number 197, 697 or by route taxi number 797, 797K or 620K from Vyhino station till bus stop "Moscow Humanitarian University".



THE REGISTRATION DESK WILL BE OPEN FOR:

on Tuesday, January 24: 10.00 - 20.00
at the Moscow Humanitarian University.

The Workshop Program, Book of Abstracts and other information will be given at the Registration Desk.

ACCOMMODATION



Sufficient number of hotel-rooms will be reserved in the at the same location as the LPM³ Workshop center. Habitation cost:

- in hotel — 30-40€
- in campus — 12€

TECHNICAL SESSIONS

The Workshop sessions will include oral presentations. The time for invited talk is 30 min. including 10 min. for questions and discussion. The time for oral presentation is 15 min. and 5 min. are given to answer the questions. Overhead, media and slide projectors will be available.

LANGUAGES

The working languages of the Workshop are English and Russian.

TIME

Moscow time is used throughout the program. Moscow time is 3 hours ahead of Greenwich time and 2 hours – of central European time.

WEATHER

The weather in Moscow the end of January 2006 is expected to be stable in with the temperature in the range of -10°C...-20°C. It is snowing, cold weather.

SOCIAL PROGRAM

A number of excursions both at Moscow are planned. The complete information concerning the social program will be available at the Registration Desk at the beginning of the Symposium.

PROCEEDINGS

Full length papers will take places to CD disk. Most interesting reports will be published in journals: “Mathematical Modeling”, “Quantum Electronics”, “Computational methods in applied mathematics”. Manuscripts have to be prepared and should be submitted to the Organizing Committee till March 1 2006.

Workshop Organizing Committee

Phones/Fax: (095) 374-7086

LPpM³ Workshop Schedule

Tuesday, January 24

TIME	Program
11.00 – 20.00	Registration, Accomodation at MosHU hotel

Wednesday, January 25

TIME	Program
10.00–11.15	Opening ceremony
11.15–11.45	Coffee break
12.00–12.20	<i>V.I.Konov.</i> Micro- and nano-processing of CVD diamonds. Natural Sciences Centre, General Physics Institute, A.M. Prokhorov General Physics Institute of Russian Academy of Sciences, 119991, Vavilov st. 38, Moscow, Russia
12.30–12.50	<i>Serge V. Garnov.</i> Ultrafast spectroscopy of femtosecond laser-gas-breakdown microplasma in nano-picosecond time-domain A.M. Prokhorov General Physics Institute of Russian Academy of Sciences, 119991, Vavilov st. 38, Moscow, Russia, garnov@kapella.gpi.ru
13.00–14.00	Lunch time
14.00–14.20	<i>V.I. Mazhukin.</i> Hierarchy of mathematical models in the processes of laser action. Insitute for Mathematical Modeling of RAS, 125047, Miususkaya sq, 4A, Moscow, Russia
14.30–14.50	<i>S.N. Andreev, V.I. Vovchenko, S.M. Klimentov, P.A. Pivovarov, A.A. Samokhin.</i> Experimental and theoretical investigation of explosive boiling of liquid on impulse-heated surface. A.M. Prokhorov General Physics Institute of Russian

TIME	Program
	Academy of Sciences, 119991, Vavilov st. 38, Moscow, Russia.
15.00–15.20	<i>O.V. Chtcheritsa, O.S. Mazhorova, Yu.P. Popov.</i> Implicit numerical algorithms for solution of phase transition problems in multi-component systems. M.V. Keldysh Institute of Applied Mathematics, Miusskaya sq, 4A, Moscow, Russia.
16.00–16.20	Coffee break
15.30–15.50	<i>M.B. Ignatiev, E.P. Kovalev.</i> Problems of modeling in enhancement of wear-resistance of tribological systems. A.A. Baykov's Institute of Metallurgy of RAS, Leninskiy prosp., 49, Moscow, Russia.
16.00–16.20	<i>P.V. Breslavsky.</i> Interaction of shock waves. Insitute for Mathematical Modeling of RAS, 125047, Miusskaya sq, 4A, Moscow, Russia
18.00–21.00	Welcome Party

Thursday, January 26

TIME	Program
10.00–10.20	<i>Gilles Flamant.</i> Plasma processing of carbon nanomaterials. Institut de Science et de Génie des Matériaux et Procédés, CNRS, Odeillo, Font-Romeu Cedex, France.
10.30–10.50	<i>Peter Berger.</i> Experimental Investigations of the Light-Plasma Interaction in Laser BeamWelding. Institut für Strahlwerkzeuge, Pfaffenwaldring 43, D-70569 Stuttgart, Germany
11.00–11.20	<i>V.N. Tokarev¹, J.I.B. Wilson², J. Lopez³, S. Lazare³.</i>

TIME	Program
	<p>Self-stopping laser ablation. Applications to the polishing diamond films and drilling superhigh-aspect-ratio holes in polymers.</p> <p>1 Natural Sciences Centre, General Physics Institute, 38 Vavilov st., Moscow, Russia 2 Department of Physics, Heriot-Watt University, Riccarton, Edinburgh, Scotland, UK 3 Laboratoire de Physicochimie Moleculaire (LPCM), UMR 5803 du CNRS, Universite de Bordeaux 1, Talence, France</p>
11.30–12.00	Coffee break
12.00–12.20	<p><i>Gordienko V.M, Platonenko V.T., Savel"ev A.B.</i> Plasma formation under interaction of superstrong laser fields with spatially inhomogeneous solids: experiment and modeling. International Laser Center, M.V.Lomonosov Moscow State University, Moscow, Russia savelev@femto.phys.msu.ru),</p>
12.30–12.50	<p><i>Serge V. Garnov.</i> Ultrafast spectroscopy of femtosecond laser-gas-breakdown microplasma in nano-picosecond time-domain</p> <p>A.M. Prokhorov General Physics Institute of Russian Academy of Sciences, 119991, Vavilov st. 38, Moscow, Russia, garnov@kapella.gpi.ru</p>
13.00–14.00	Lunch time
14.00–14.20	<p><i>V.I. Mazhukin.</i> Hierarchy of mathematical models in the processes of laser action.</p>

TIME	Program
	Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia,
14.30–14.50	<p><i>S.N. Andreev, V.I. Vovchenko, S.M. Klimentov, P.A. Pivovarov, A.A. Samokhin.</i> Experimental and theoretical investigation of explosive boiling of liquid on impulse-heated surface.</p> <p>A.M. Prokhorov General Physics Institute of Russian Academy of Sciences, 119991, Vavilov st. 38, Moscow, Russia.</p>
15.00–15.20	<p><i>O.V. Chtcheritsa, O.S. Mazhorova, Yu.P. Popov.</i> Implicit numerical algorithms for solution of phase transition problems in multi-component systems.</p> <p>M.V. Keldysh Institute of Applied Mathematics, Miuskaya sq, 4A, Moscow, Russia.</p>
15.30–16.00	Coffee break
16.00–16.20	<p><i>O.N. Koroleva¹, V.I. Mazhukin².</i> Mathematical modeling of multilayer materials.</p> <p>1 Moscow Humanitarian University. 2 Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia</p>
16.30–16.50	<p><i>V.N. Lednev, Yu. Ya. Kuzhyakov.</i> Diagnostics of carbon laser plasma in Nitrogen atmosphere (synthesis of carbon-nitride films).</p> <p>Lomonosov MSU, Vorob'evy gory, Moscow, Russia</p>
17.00–17.20	<p>A.V. Koldoba, E.V. Koldoba. Mathematical modeling of multicomponent filtration with phase transitions.</p> <p>M.V. Keldysh Institute of Applied Mathematics, Miuskaya sq, 4A, Moscow, Russia.</p>
17.30–17.50	<p><i>Yu.A. Povechtchenko.</i> Software for hydrodynamical modeling of gas fields.</p>

TIME	Program
	M.V. Keldysh Institute of Applied Mathematics, Miuskaya sq, 4A, Moscow, Russia.
18.00–21.00	Welcome Party

Friday, January 27

TIME	Program
10.00–10.20	<i>A.M. Lapanik, M.M Chuiko. Mathematical modeling of convective flows in domains with arbitrary shape.</i> Institute of Mathematics, Surganova st, 7, Minsk, Belarus.
10.30–10.50	<i>V.I. Mazhukin. Mathematical modeling of laser influence on materials. SOFTWARE Lastec.</i> Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia. immras@orc.ru
11.00–11.20	<i>Ivanov A.A., Rodionov N.B., Hairutdinov P.P. Numerical modeling of plasma heating in tokamak in the frequency range of ion-cyclotron resonance.</i> M.V. Keldysh Institute of Applied Mathematics, Miuskaya sq, 4A, Moscow, Russia.
11.30–11.55	Coffee break
12.00–12.55	Development of software in IMMRAS in the field of modeling of large hydrodynamic problems. 1. <i>S.V.Polyakov. Common structure of GMM package.</i> 2. <i>M.V. Yakobovskiy. Organization of parallel computations in large hydrodynamics problems.</i>

TIME	Program
	3. <i>V.A. Gasilov</i> . Modeling results. Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia
13.00–14.00	Lunch time
14.00–14.15	<i>Mazhukin V.I., Nikiforov M.G.</i> Mathematical modeling of spectrum of non-equilibrium plasma. Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia
14.20–14.35	<i>M.V. Mazhukin</i> ¹ , <i>Christian Fieve</i> ² , <i>François Gentils</i> ² . Mathematical model of molecular gas breakdown. 1 Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia 2 Schneider Electric, Grenoble, France
14.40–14.55	<i>D.K. Ilinitsky</i> . Mathematical model of nonequilibrium laser heating of semiconductor. Insitute for Mathematical Modeling of RAS, 125047, Miuskaya sq, 4A, Moscow, Russia
15.00–15.20	Closing of Symposium
16.00–18.00	Farewell Party

Saturday, January 28

TIME	Program
10.00–23.00	Cultural program