18.th Research Workshop
Nucleation Theory and Applications
Dubna, Russia, April 1 – 30, 2014

First Announcement

General Information

Research workshops on ***Nucleation Theory and Applications*** have been organised at the Joint Institute for Nuclear Research in Dubna, Russia, since 1997 every year in close co-operation between the Department of Physics of the University of Rostock, Germany (Dr. Jürn W. P. Schmelzer, Prof. Gerd Röpke) and the Bogoliubov Laboratory of Theoretical Physics of the Joint Institute for Nuclear Research (JINR), Dubna, Russia (Prof. Vyatcheslav B. Priezzhev, Dr. Vyatcheslav I. Zhuravlev, Mrs. Galina G. Sandukovskaya). The organisation of the workshops was and is supported by colleagues from the International Department of the JINR (Mrs. Elena N. Rusakovich) and sponsored by the Heisenberg - Landau program of the German Ministry for Science and Technology (BMBF), the Deutsche Forschungs-gemeinschaft (DFG), the German Academic Exchange Council (DAAD), the Russian Foundation for Basic Research and others.

The general aim of the workshops was and is

- to discuss recent developments in this field with particular emphasis on the work done in the different groups invited;
- to establish and/or tighten direct co-operation links in the framework of different common projects (DFG, BMBF, DAAD, QSIL, etc.);
- to bring together a number of leading scientists in the field of the theoretical description and experimental investigations of first-order phase transformations and critical phenomena of the member countries of JINR, Germany and beyond in order to perform or develop new research projects in this field;
- to check whether the experimental facilities available at the JINR in Dubna can be utilised for an experimental investigation of the kinetics of phase transformation processes in different systems of interest.

These aims could be fully realised as it is evident also from the Workshop Proceedings which have been published in Dubna in 1999, 2002, 2005, 2008, and 2011. In the present year, the 2nd edition of a monograph (I. S. Gutzow, J. W. P. Schmelzer: ***The Vitreous State: Thermodynamics, Structure, Rheology, and Crystallization***, Springer, 2013 has been published and another common monograph (J. W. P. Schmelzer (Ed.): ***Glass: Selected Properties and Crystallization***, de Gruyter, 2014) is in the final stage of preparation.

Time-table

- The 18.th research and scientific communication meeting will be held in Dubna for a period of one month in the range from April 1 - 30, 2014, hereby the mutual detailed information on the research carried out in the different groups (**workshop part**) will be covered primarily in the time from ***April 12 (arrival) till April 20 (departure), 2014.*** Work on common projects under way (1. 4. - 30. 4. 2014) will be performed by special arrangement.
- Mutual research visits of the participants in the course of the year (in dependence on financial funds available).

The program of the workshop part will be tentatively finalised in January, 2014. Please, submit us your proposals for contributions till the end of December, 2013. Some proposals for talks which could either not be presented in this year, have been already submitted or tentatively agreed upon are listed below (please, reconfirm in any case if not done already):

1. Vladimir S. Balitsky, L. V. Balitskaya, D. V. Balitsky, V. A. Rassulov, and T. V. Setkova (Chernogolovka, Russia): Growing of Cr-Containing Topaz Single Crystals on a Seed and Their Characterization_
2. Vladimir N. Piskunov, D. V. Tsaplin, and R. A. Veselev (Sarov, Russia): Simulation of Particle Ejecta Effects from the Surface under Impulse Action
3. Alexander S. Abyzov and J. W. P. Schmelzer (Kharkov, Ukraine, Dubna, Russia and Rostock, Germany): Generalized Gibbs' Approach in Heterogeneous Nucleation
4. Bulat N. Galimzyanov and A. V. Mokshin (Kazan, Russia): Steady-state Homogeneous Nucleation and Growth of Water Droplets: Extended MD Numerical Treatment
5. Anatoli V. Mokshin (Kazan, Russia): Crystal Nucleation and Growth in a Model Glass under Shear
6. Rainer Feistel (Rostock-Warnemünde, Germany): Steam-Engine Climate
7. Andriy M. Gusak (Cherkassy, Ukraine): Competitive Nucleation in Open Nano-Systems
8. Vadim V. Brazhkin and K. Trachenko (Troitsk, Russia & London, UK): What Separates a Liquid from a Gas?
9. K. Trachenko and Vadim V. Brazhkin (Troitsk, Russia & London, UK): Liquid Heat Capacity and the Glass Transition
10. Karolina Adrjanowicz, M. Paluch, A. Grzybowski, K. Kaminski, and S. Jurga (Katowice, Poland): Crystallization of Glass-Forming Liquids under Elevated Pressure: Isochronal Crystallization Kinetics Approach
11. Vladimir M. Fokin, R. M. C. V. Reis, A. S. Abyzov, C. R. Chinaglia, J. W. P. Schmelzer, and E. D. Zanotto (St. Petersburg, Russia; Sao Carlos, Brazil; Kharkov, Ukraine; Dubna, Russia & Rostock, Germany): Non-stoichiometric Crystallization of Lithium Metasilicate-Calcium Metasilicate Glasses
12. C. Schick and E. Zhuravlev (Rostock, Germany): Thermal Stability of Homogeneous Nuclei in Polymers
13. Yuri K. Startsev (St. Petersburg, Russia): Ice-Coverage up of a Plane: To be or not to be? Physical Chemistry Analysis

Evening talks

14. Yuri K. Startsev (St. Petersburg, Russia): A Relaxed Talk on "hurtig" Travelling Along the Hurtigroute: Our Norway's Voyage to the 71st Parallel by Ferry
15. Jürn W. P. Schmelzer (Dubna, Russia and Rostock, Germany): Elements of Greek Philosophy and Molecular Dynamics: Some Evening Reflections
16. Naoum M. Kortsensteyn (supported by his wife and camera): Barcelona is (much) more than only Barca!

Some Hints Concerning Presentations

The time for the speakers in their lectures is - if not specified otherwise - not strictly limited to allow one a detailed explanation even of details of the research and an extensive discussion. Nevertheless, due to the large number of highly interesting contributions already proposed now and to have some order in anticipating the program, commonly either 1 hour or 30 minutes are taken as a rough estimate for the duration of one lecture. Please specify the time you need in submitting your proposal.

The workshop languages are English and Russian. If possible, English should be preferred. At least, the presentations (Power point etc.) should be written in English. Summaries of the content in the respective alternative language will be given as far as necessary.

Accommodation and Financial Regulations

No conference fee is required. We will cover, as a rule, the costs for accommodation in Dubna and, as far as possible, the travel expenses (at the level of the costs for railway tickets of ***the cheapest category*** ("platzkartnyi vagon")) for invited speakers from Russia and the former Soviet Republics to Dubna and back (**for refunding the expenses, please, do not forget to take a *komandirovotschnoe udostoverenie* with you**). Moreover, our colleagues from Moscow and Moscow region we would like to ask to pay the travel costs by themselves as already done in previous years. In case of questions, please, contact us.

Addresses for Contacts

All questions concerning the workshop, please, submit to ***Dr. Jürn W. P. Schmelzer*** and ***Prof. Vyatcheslav B. Priezzhev:***

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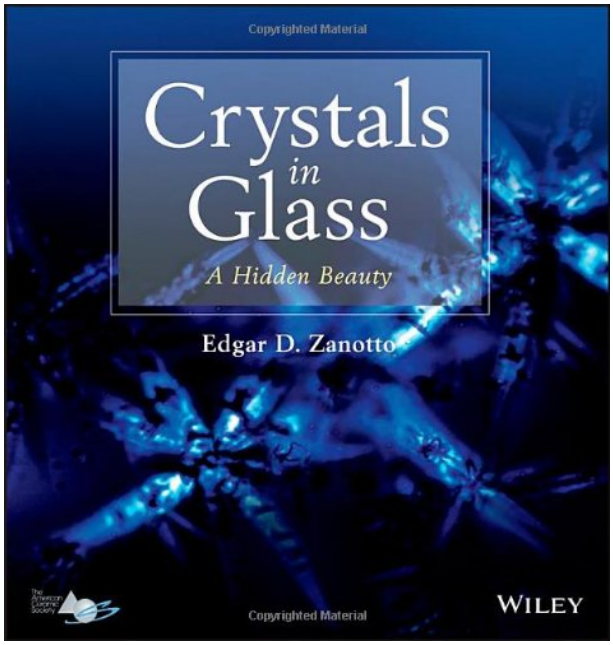
For further details see also the homepage of the Bogoliubov Laboratory of Theoretical Physics of the Joint Institute for Nuclear Research, Dubna, Russia, **http://theor.jinr.ru**, and the homepage of the JINR, **http://www.jinr.ru.**

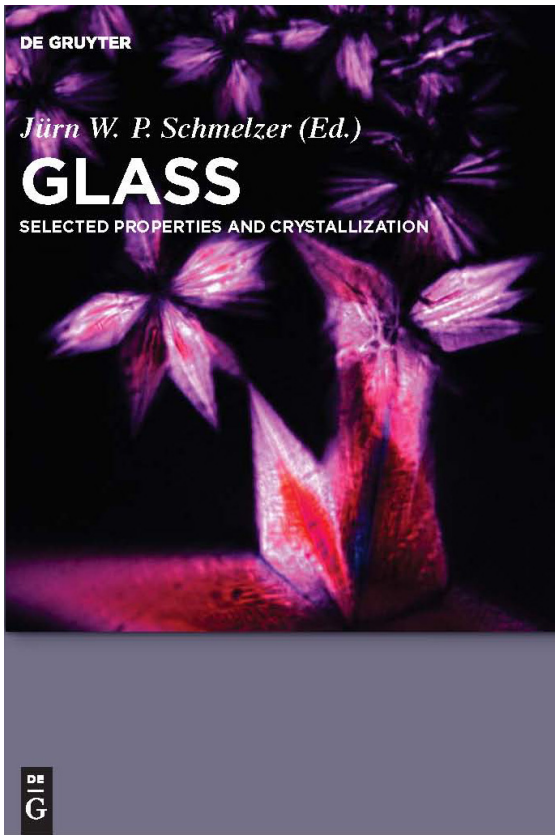
Looking forward to seeing you in Dubna.

Jürn W. P. Schmelzer ***Gerd Röpke*** ***Vyatcheslav B. Priezzhev***

Some additional information on some recent and future book publications



http://www.amazon.com/Crystals-Glass-A-Hidden-Beauty/dp/1118521439



http://www.degruyter.com/view/product/185568?format=G&rskey=aQJV5g

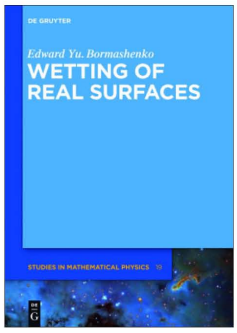
Edward Yu. Bormashenko

WETTING OF REAL SURFACES

The revealing of the phenomenon of superhydrophobicity (the "lotus effect") has stimulated an interest in wetting of real (rough and chemically heterogeneous) surfaces. In spite of the fact that wetting has been exposed to intensive research for more than 200 years, there still is a broad field open for theoretical and experimental research, including recently revealed superhydrophobic, superoleophobic and superhydrophilic surfaces, so-called liquid marbles, wetting transitions, etc. This book integrates all these aspects within a general framework of wetting of real surfaces, where physical and chemical heterogeneity is essential.

Wetting of rough/heterogeneous surfaces is discussed through the use of the variational approach developed recently by the author. It allows natural and elegant grounding of main equations describing wetting of solid surfaces, i.e. Young, Wenzel and Cassie-Baxter equations. The problems of superhydrophobicity, wetting transitions and contact angle hysteresis are discussed in much detail, in view of novel models and new experimental data.

Edward Yuri Bormashenko, Ariel University Center of Samaria.



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