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BOOK OF ABSTRACTS

Edited by: J. Clérouin, C. Deutsch, M. Koenig, G. Maynard,
M. Mikikian, V. Recoules, N. Deutsch

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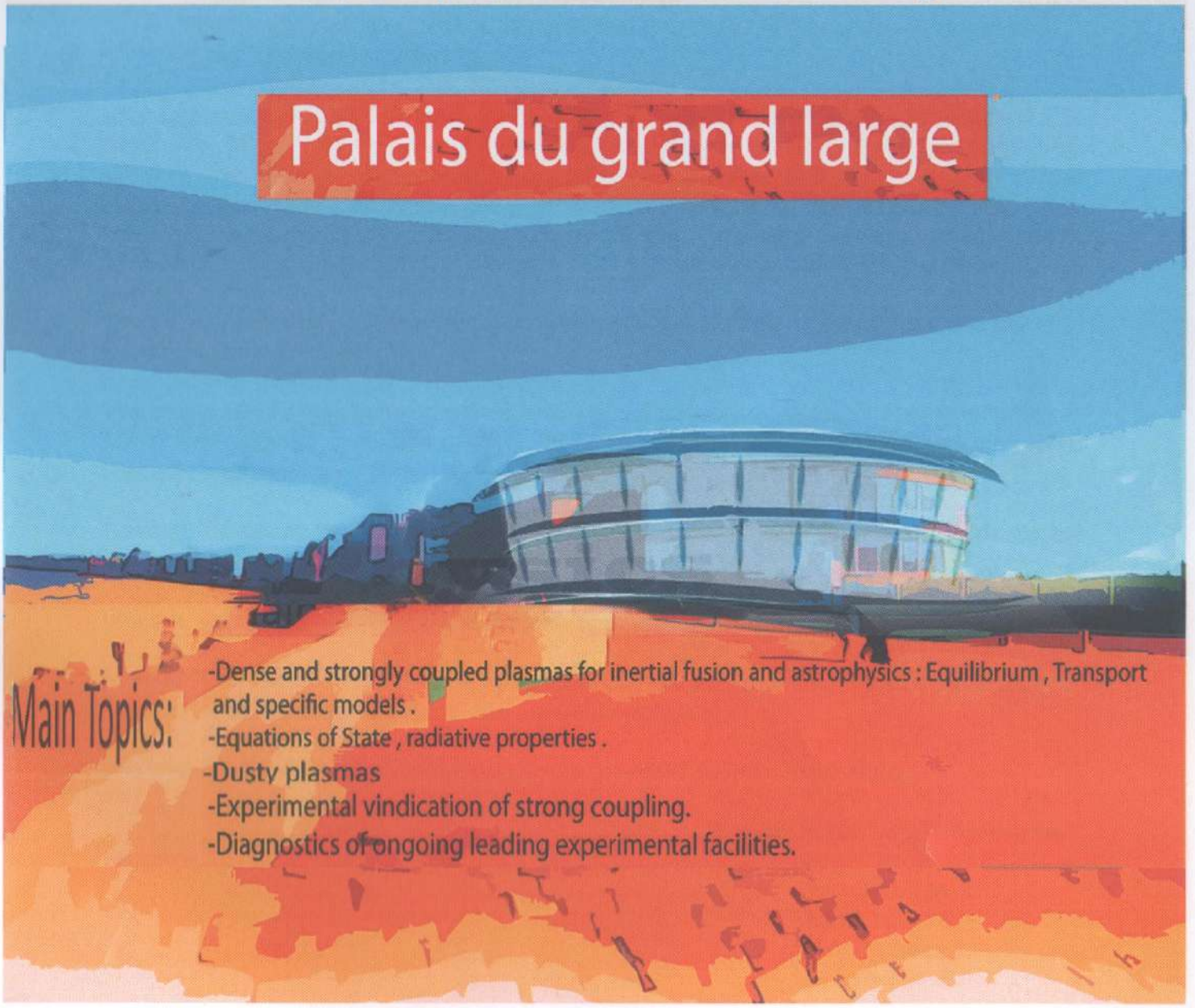

TOPICS

1. Statistical physics and ab-initio simulations
2. Production of non-ideal plasmas (using optical lasers, free electron lasers, heavy-ion beams, Z machine, high explosives etc.)
3. Diagnostics of non-ideal plasmas (using x-ray scattering, line shapes, stopping power, emission and absorption, etc.)
4. Equilibrium properties, equations of state and phase transitions
5. Kinetics, transport and optical properties
6. Dense astrophysical and ICF plasmas
7. Ultra-intense laser-matter interaction
8. Dusty plasmas

Table of contents

I - Invited C - Contributed Talk P - Poster

For the application of vacuum-arc units in nanoengineering

Zhukeshov A.M.[1,2], Gabdullina A.T.[1,2], Amrenova A.U.[1,2], Mukhamedryskyzy M.[1,2], Fermakhan K.[1,2], Balmanova N.T.[1], Iliyasov R.K.[1], Maksut D.M.[1], Mansur N.Sh.[1]

[1]*Al-Farabi Kazakh National University, KAZAKHSTAN*
[2]*National nanotechnology laboratory of open type, KAZAKHSTAN*

One of the priority areas of the research is the study and production of nanostructured materials. The priority of this research consists of the prospects and opportunities for the development of this technology [1,2].
Vacuum arc spraying refers to a group of methods for obtaining coatings (including thin films) in vacuum, in which the coating is obtained by direct condensation of vapor of the deposited material and the chemical reaction on the surface of the substrate is activated by heating, or by ionization and dissociation of arc gas [3,4]. In this case, the target from the sputtered material is in a strongly-ionized plasma under a negative potential and plays a role of a cathode, i.e. the electric current creating the arc is fed into the circuit containing the cathode (negative potential) and the body of the vacuum chamber (positive potential) [5].
The paper proposes to use the installation of the vacuum-arc accelerator (VDU-1) for research to obtain nanostructured materials. The unit VDU-1 was developed in the pulsed plasma accelerator laboratory of Al-Farabi Kazakh National University [6,7]. At the moment, works on the modernization of the electrode system have been carried out. To solve this problem, the results of work on optimizing the processing regimes of the materials under study are presented. Calorimeters of various shapes were used to effectively determine the energy parameters of the plasma generated at the accelerator VDU-1. In addition, implemented works on obtaining nanostructured materials at VDU-1. In particular, preliminary data on the investigation of nanofilms and nanopowders are presented, for analysis of which the equipment of Nanotechnology laboratory of open type was used.
The research in this area can be claimed in various branches of science and technology since they can give an economic effect from the use of final products.

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