Technical Program

MODELLING FOR AEROSPACE APPLICATIONS Friday, 7th of December 14:00-16:00		Arctica 2.02
The study of the atmosphere, hydrodynamics, aerodynamics, sensors		
14:00	"Water pump" mechanism of transporting vapor to the Martian upper atmosphere	D. Shaposhnikov[1,2] , A. Rodin[1,2], A. S. Medvedev[3] *[1] MIPT,* *[2] Space Research Institute RAS,* *[3] Max Planck Inst Solar System R*
14:20	Non-hydrostatic general circulation model of the Venus atmosphere	M. Razumovsky[1], A. Rodin[1,2] *[1] MIPT,* *[2] Space Research Institute RAS*
14:40	Feature-Based Deep Learning Method for fluid dynamics	Yixing Wang[1], Renkun Han[1], Gang Chen[1,2] *[1]State Key Laboratory for Strength and Vibration of Mechanical Structures,* *[2]Shaanxi Province Key Laboratory for Service Environment and Control of Advanced Aircraft, Xi'an Jiaotong University*
15:00	Design and development of spacecraft structures in terms of ensuring their maximum strength and minimum weight.	V. Semenov[1,2], H. Zinta[1] *[1] MIPT,* *[2] Central Aerohydrodynamic Institute (TsAGI)*
15:20	Experimental and Numerical Investigation of Tip Vortex Structures on a Bio-inspired Discrete Wing	Zhe Hui, Yang Zhang, Gang Chen, Yueming Li *State Key Laboratory for Strength and Vibration of Mechanical Structures, Shaanxi Province Key Laboratory for Service Environment and Control of Advanced Aircraft, Xi'an Jiaotong University*
15:40	Structure and shear coupled motion of <001> tilt grain boundaries in titanium nitride	Lei Zhang, Wenshan Yu, Shengping Shen *State Key Laboratory for Strength and Vibration of Mechanical Structures, Shaanxi Engineering Laboratory for Vibration Control of Aerospace Structures, School of Aerospace Engineering, Xi'an Jiaotong University*

Technical Program		
MODELLING FOR AEROSPACE APPLICATIONS **Friday, 7th of December 16:20-18:00**		**Arctica** **2.02**
Space dust, analytical mechanics, interboard flights		
16:20	Regolith of Near-Earth Asteroids (NEA) as the target of satellite mission: Itokawa' lesson.	S. Voropaev, N. Dushenko, A. Stennikov *GEOKHI RAS*
16:40	Perspective instrument Meteor-2 for study and collection of samples from asteroid transit atmosphere	A. Krivenko, A. Demianov, V. Vysochkin *GEOKHI RAS*
17:00	Near-Earth Asteroids as a Base for Interplanetary Economy Supply	S. Biktimirov[1], R. Lipkis[2], A. Toporkov[3], P. Skobelev[4], A. Tsarev[4], A. Ivanov[1] *[1] Skolkovo Institute of Science and Technology* *[2] Stanford University* *[3] Bauman Moscow State Technical University* *[4] Software Engineering Company Smart Solutions*
17:20	An adaptive algorithm for search and support of the equilibrium orbital orientation of the International Space Station	E. Mikrin, S. Timakov *RSC "Energia"*
17:40	Application of algorithm of sequence-closure in the problem of searching and maintaining the equilibrium orientation of the large space station	K. Bogdanov, S.Timakov *RSC "Energia"*
18:00	Method of Development Testing the Visual Navigation and Hazard Detection System Designed Based on Unified Functional Modules	N. Ryabogin, A. Koshelev, E. Pronina *Joint Stock Company "Russian Space Systems"*

Technical Program

MODELLING FOR AEROSPACE APPLICATIONS Saturday, 8th of December 14:00-16:00		Arctica 2.02
Mechanics, power generation, combustion, engines		
14:00	About illumination of Russian Arctic regions by groups of satellite illuminators with total reflected sunlight during the polar night	A.Boger[1], S.Timakov[2] *[1] MIPT,* *[2] RSC "Energia"*
14:20	Flexoelectricity and its applications in energy harvesting	Qian Deng, Shengping Shen *State Key Labboratory for Strength and Vibration of Mechanical Structures, School of Aerospace, Xi'an Jiaotong University*
14:40	Flexoelectric energy harvesting with circular membrane	Zhaoqi Li, QianDeng, Shengping Shen *State Key Labboratory for Strength and Vibration of Mechanical Structures, School of Aerospace, Xi'an Jiaotong University*
15:00	Experience on calculating laminar flame speed in the framework of RANS equations with simplified chemical mechanism	Wenchao Liu *MIPT*
15:20	Analysis of the effect of water injection in the supersonic jet of liquid-propellant rocket on gasdynamic loadings acting on launchers	A. Minko[1], O. Guskov[1,2] *[1] Central Institute of Aviation Motors,* *[2] MIPT*
15:40	Validation of models for calculating the combustion of hydrogen in a supersonic flow according to the results of the accurate physical experiment	N. Kukshinov[1], S. Batura[1], M. Frantsuzov[1], O. Guskov[1,2] *[1] Central Institute of Aviation Motors,* *[2] MIPT*
16:00	Recent development in mechanics of soft materials and machines	Zishun LIU *International Center for Applied Mechanics; State Key Laboratory for Strength and Vibration of Mechanical Structures, Xi'an Jiaotong University, China*

Technical Program

SMALL SATELLITES Friday, 7th of December 14:00-16:00		Arctica 5.02
Constellation of satellites, the use of microsatellites, ion engines, platforms		
14:00	Aerospace infocommunications network EFIR satellite constellation	A.M.Saushkin *Corporation RSS*
14:20	Microsatellites and educational programs	L. Zelenyi, S. Klimov, A. Sadovski *Space Research Institute RAS*
14:40	Sun-Venus Lagrangian point satellite for the Venera-D mission	I. Kovalenko, N. Eismont *Space Research Institute RAS*
15:00	School scientific experiment on board satellites "SiriusSat-1,2"	Z. Zhumaev, R. Zharkikh, V. Ivanenko, A. Kopik *SPUTNIX*
15:20	Microsatellite project for sounding upper atmosphere	I. Gazizov[1], R.Talipov[1], S. Zenevich[1], M. Spiridonov[1,3], A. Rodin[1,2] *[1] MIPT,* *[2] Space Research Institute RAS,* *[3] Prokhorov General Physics Institute*
15:40	KeRC activities in the field of small satellite EP	A. Lovtsov *KeRC*

Technical Program

SMALL SATELLITES Friday, 7th of December 16:20-18:00		Arctica 5.02
Quality of constellation, ISS, platforms		
16:20	Tabletsat microsatellite platform and its applications	N. Ivlev[1,3], A. Sivkov[1], A. Purikov[2], V. Ivanenko[2] *[1] MIPT,* *[2] SPUTNIX* *[3] Space Research Institute*
16:40	Writing with Sunlight: a Feasibility Study of a CubeSat Formation Mission	N.Mullin, S.Biktimirov, A. Kharlan, D.Pritykin *Skolkovo Institute of Science and Technology*
17:00	Evaluation of the quality characteristics of satellite systems by mathematical modeling	A. Gritsenko *ISC "Severnaya Corona"*
17:20	Microsatellites as a part of the International Space Station's Russian segment infrastructure.	V.Angarov, M.Dolgonosov, L.Zelenyi, S.Klimov, V.Nazarov, D.Novikov, A.Petrukovich, V.Rodin, N.Eismont *Space Research Institute*
17:40	Mid-IR fiber components for space-borne spectroscopic instruments	T.Tebeneva[1], O.Benderov[1], B. Stepanov[2], I.Nechepurenko[3], A. Rodin[1] *[1] MIPT,* *[2] Institute of Chemistry of High-Purity Substances RAS* *[3] Dukhov research Institute af automatics*
18:00	The new type of antenna design for spacecraft	M. Moiseev, V. Avdonin, A.Nelin *JSC Russian Space System*

Technical Program

SMALL SATELLITES Saturday, 8th of December 14:00-16:00		Arctica 5.02
Diagnostics, sensors, analytical mechanics		
14:00	Satellite dynamics with aerodynamic attitude control system	S.A. Gutnik *MIPT, Central Aerohydrodynamic Institute (TsAGI)*
14:20	Active vibration analysis/control of inflatable space antenna reflectors	J. Mohanty *Skolkovo Institute of Science and Technology*
14:40	Small Satellites Structural Elements Tension Control by Quantum Sensor made of Modified Diamond with NV-center	S. Dianov[1], V. Novichkov[2] *[1] Moscow State Technical University of Civil Aviation,* *[2] Moscow Aviation Institute*
15:00	Information-Measuring System for Endurance Test of Small Satellites Structural Elements	V.Novichkov, Yu. Mishin *Moscow Aviation Institute*
15:20	High throughput X-band transmitters for the small satellites.	E. Kruglik *NPP «SAIT»*

Technical Program

SPACE DEBRIS Friday, 7th of December 14:00-16:00		Arctica 5.19(1)
Causes, consequences and parameters		
14:00	Determination of spacecraft non-orbital parameters	A.V. Yudaev *MIPT*
14:20	Geopolitical aspects of active debris removal: legal challenges and economic perspectives	A.V. Bondarenko *First Civil University*
14:40	Track detection using convolutional neural network.	A. Shevchenko, A. Shemenev *MIPT*
15:00	Analytical expressions for magnetic tensors of geometric primitives	S.Efimov, *MIPT*
15:20	Project of space-rocket system intended for disposal of space debris at geostationary orbit	S.A. Ishkov, P.V. Fadeenkov, G.A. Filippov *Samara national research university*
15:40	Analysis of the ISON network contribution to the solution of near-Earth space monitoring tasks	I.E. Molotov *Keldysh Institute of Applied Mathematics RAS* *Small innovation enterprise «KIAM Ballistics-Service» Ltd.*

Technical Program

SPACE DEBRIS Friday, 7th of December 16:20-18:00		Arctica 5.19(1)
Determination the parameters of objects		
16:20	Astrometry and Photometry of Satellites and Space Debris at the ISON-Castelgrande Observatory	S.Schmalz[1], I. Molotov[1], F. Graziani[2], V. Kouprianov[4], R. Di Roberto[2], M. Truglio[2], V. Voropaev[1] *[1] Keldysh Institute of Applied Mathematics RAS* *[2] G.A.U.S.S. Srl, Via Sambuca Pistoiese* *[3] University of North Carolina, Department of Physics and Astronomy,* *[4] Central Astronomical Observatory RAS*
16:40	New Orbit Estimation Algorithms and Their Analysis in Difficult Observation Conditions for UN ORT Data	A. Kolessa[1,2], A. Lukyanov A.[1,2], V. Radchenko[1,2], A. Ivanov A.[1,2], A. Tartakovsky[1] *[1] MIPT* *[2] JSC "Vimpel"*
17:00	Recognition of objects from images of an optical telescope	I. Perepechkin, E. Polnikov, V. Semaka, E. Pliashkov, N. Zavialova *MIPT*
17:20	An overview of modern numerical methods for ballistics	N.Zavialova, A. Bikov, I.Zavialov, V.Panov, R. Plavnik *MIPT*
17:40	Optimal spectral range determination for the small satellite onboard camera for remote determination of the geostationary space debris physical properties.	R. Ramaldanov *TSNIIMASH*

Technical Program

STUDENT CONTEST Saturday, 8th of December 14:00-16:00		Arctica 5.19(1)
Simulation & Experiment		
14:00	Proposed system design idea of collection and safe disposal of small space debris.	Amar Kumar Sahadev Ram *MIPT*
14:15	Simulation of the radio link operation using adaptive coding modulation	A. Nikolaeva[1], Yu. Nesterkin[2] *[1] MIPT,* *[2] Corporation RSS*
14:30	Research and analysis of the defective structure of a metal sample after tensile tests to determine the properties of the material	N. Burtelova *MIPT*
14:45	The assessment of operational capability of the space-based hyperspectral complex (HSC).	S. Zotov[1], Y. Dmitriev[2], S. Shibanov[1] *[1] MIPT,* *[2] Institute of Numerical Mathematics, RAS*
15:00	Reflector and actuators for the mechanically reconfigurable space antenna	Siyang Song, Shubao Shao, Minglong Xu, Yan Shao *State Key Laboratory for Strength and Vibration of Mechanical Structures, School of Aerospace, Xi'an Jiaotong University*
15:15	Lightning detector for small science satellite	V. Kvitka[1,2], V. Prasolov[1], M. Klyushnikov[1], A. Korkh[1] *[1] Joint Stock Company «Space Rocket Centre «Progress»–Scientific and Production Enterprise «OPTECS»* *[2] MIPT*
15:30	Strain-modulated initial stage oxidation of iron surface	Yihan Wu, Wenshan Yu, Shengping Shen *State Key Laboratory for Strength and Vibration of Mechanical Structures, Shaanxi Engineering Laboratory for Vibration Control of Aerospace Structures, School of Aerospace Engineering, Xi'an Jiaotong University*
15:45	Demonstration of interferometric coronagraphy technology using a nanosatellite	A. Yudaev, I. Ochneva *MIPT*