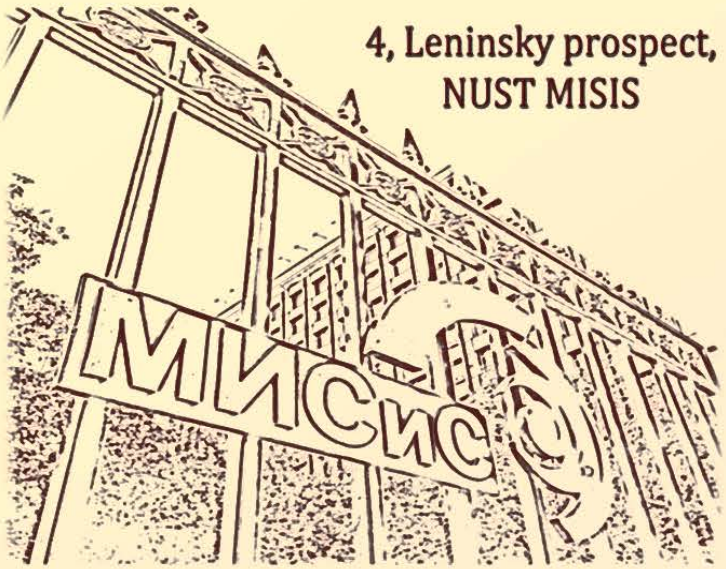
SHS 2019

MISIS

ISMAN



PROGRAM
of
XV International Symposium on Self-Propagating High-Temperature Synthesis

September, 16-20, 2019

Moscow, Russia

Organizers

- ✓ National University of Science and Technology "MISiS" (NUST "MISiS"), Moscow, Russia
- ✓ Merzhanov Institute of Structural Macrokinetics and Materials Science, Russian Academy of Sciences (ISMAN), Chernogolovka, Russia

Symposium is carried out under the support of:

- ✓ The Russian Foundation for Basic Research (RFBR) (Project 19-08-20051)
- ✓ The Ministry of Science and Higher Education of the Russian Federation (Program of increasing the competitiveness of the National University of Science and Technology "MISiS" among leading world scientific-and-educational centers - 5-100)
- ✓ The Russian Academy of Science

Symposium Committees

SYMPOSIUM CO-CHAIRMEN:
E.A. Levashov (Russia)
M.I. Alymov (Russia)

INTERNATIONAL COORDINATORS:
Yu.S. Pogozhev (Russia)
V.N. Sanin (Russia)

LOCAL ORGANIZING COMMITTEE:
A.M. Alymova (Russia)
O.V. Amelina (Russia)
O.A. Golosova (Russia)
V.V. Kurbatkina (Russia)
O.O. Likhanova (Russia)
O.S. Manakova (Russia)
A.Yu. Potanin (Russia)
D.A. Sidorenko (Russia)
A.E. Sytschev (Russia)
M.K. Melkonyan (Russia)

PROGRAM COMMITTEE:
A.S. Mukasyan (USA) – chair
A.S. Rogachev (Russia) – vice chair
F. Baras (France)
E. Dreizin (USA)
Z. Fu (China)
K. Manukyan (USA)
H. Nersisyan (Korea)
R. Orru (Italy)
J. Puszynski (USA)
S.A. Rogachev (Russia)
D.V. Shtansky (Russia)
D. Vrel (France)
T. Weihs (USA)

INTERNATIONAL ADVISORY BOARD:
A.A. Chernikova (Russia) – chair
S.M. Aldoshin (Russia)
N.P. Aleshin (Russia)
I. Agote (Spain)
M.I. Alymov (Russia)
A.P. Amosov (Russia)
S.T. Aruna (India)
T. Babul (Poland)
O.A. Bannykh (Russia)
V.V. Boldyrev (Russia)
F. Bernard (France)
V.M. Buznik (Russia)
G. Cao (Italy)
B. Derin (Turkey)
M.R. Filonov (Russia)
F.V. Grechnikov (Russia)
E. Gutmanas (Israel)
V.M. Ievlev (Russia)
A.F. Ilyushchenko (Belarus)
E.N. Kablov (Russia)
M.I. Karpov (Russia)
A. Kawasaki (Japan)
S. Kharatyan (Armenia)
V.S. Komlev (Russia)
M.N. Krasnyanskii (Russia)
N.T. Kuznetsov (Russia)
S.A Kuznetsov (Russia)
E.A. Levashov (Russia)
J. Lis (Poland)
N.Z. Lyakhov (Russia)
V.I. Lysak (Russia)
Yu.M. Maksimov (Russia)
Z. Mansurov (Kazakhstan)
R. Mendes (Portugal)
A.S. Mukasyan (USA)
O. Odawara (Japan)
S.A. Oglezneva (Russia)
M. Ohyanagi (Japan)
G. Oniashvili (Georgia)
M. Rodriguez (Spain)
A.S. Rogachev (Russia)
A.I. Rudskoy (Russia)
V.N. Sanin (Russia)
V.I. Sergienko (Russia)
V.Ya. Shevchenko (Russia)
A.E. Sytschev (Russia)
G.F. Tavadze (Georgia)
A.Yu. Tsivadze (Russia)
P. Vincenzini (Italy)
G. Xanthopoulou (Greece)
O. Yücel (Turkey)
V.I. Yukhvid (Russia)

Time Table of SHS-2019

Time	Monday 16.09		Tuesday 17.09			Wednesday 18.09		Thursday 19.09		Friday 20.09
	Auditorium ***Б3***	*Auditorium* ***Б4***	*Auditorium* ***Б3***	*Auditorium* ***Б4***	*Auditorium* ***Б2*** *(1st floor)*	*Auditorium* ***Б3***	*Auditorium* ***Б4***	*Auditorium* ***Б3***	*Auditorium* ***Б4***	*Auditorium* ***Б3***
9:00	Registration *2nd floor, in front of auditoriums Б3, Б4*		*Session 3* Refractory and ultra-high-temperature materials	*Session 4* SHS in metallurgy, welding, soldering	*Session 7* Solution combustion synthesis	*Session 6* SHS in thin films and surface engineering	*Session 8* Mechanically activated systems	*Session 9* Application and industrialization	*Session 10* Consolidation, hybrid and additive technologies	*Session 11* Functional materials: bio, catalytic, energetic, magnetic, electronics, optics, etc.
10:00	Opening Ceremony ***Auditorium Б3***									
10:30	Plenary session ***Auditorium Б3***									
11:15			***Coffee break - 15 min***			***Coffee break - 15 min***		***Coffee break - 15 min***		Closing ceremony
11:30			*Session 3* Refractory and ultra-high-temperature materials	*Session 4* SHS in metallurgy, welding, soldering	*Session 7* Solution combustion synthesis	*Session 6* SHS in thin films and surface engineering	*Session 8* Mechanically activated systems	*Session 9* Application and industrialization	*Session 10* Consolidation, hybrid and additive technologies	
12:00										
13:00	***Lunch***		***Lunch***			***Lunch***		***Lunch***		
14:15	*Session 1* Combustion theory and modeling	*Session 2* Powder materials	*Session 5* Kinetics and mechanisms of chemical and structure transformations	*Session 4* SHS in metallurgy, welding, soldering	*Round table* "The international dialog on environmental, health and safety issues in metallurgy and mining"	*Session 6* SHS in thin films and surface engineering	*Session 8* Mechanically activated systems	*Session 11* Functional materials: bio, catalytic, energetic, magnetic, electronics, optics, etc.	*Session 10* Consolidation, hybrid and additive technologies	
15:15						*15.15 – 15.40* *Walk from the main building to the pier «Krymsky Bridge»*				
16:00	***Coffee break - 15 min***		***Coffee break - 15 min***			*16:00 – 19:00* ***Moscow River Boat Tour*** *Round table: "30th Anniversary of the SHS-Center MISiS-ISMAN, development of educational trajectories",* *Social event*		Poster session 16:00 – 17:00		
16:15	*Session 1* Combustion theory and modeling	*Session 2* Powder materials	*Session 5* Kinetics and mechanisms of chemical and structure transformations	*Session 4* SHS in metallurgy, welding, soldering	*Round table* "Materials science and engineering vs. Mega Science projects"			*17:00 – 18:00* *Transfer to the banquet venue*		
18:00	***Welcome party,*** *University café* *18:00 – 20:00*							***Banquet*** *18:00 – 21:00*		

Program of XV Int. Symposium on SHS, September, 16-20, 2019

DAY 1: MONDAY, SEPTEMBER 16, 2019

09.00 – 17.00	**Registration:** *the main building of NUST "MISiS", Leninsky prospect, 4,* *2nd floor hall, in front of auditoriums Б3, Б4*
10.00 – 10.30	**OPENING CEREMONY** *Auditorium Б3, 1st and 2nd floors of the main building*

Plenary Session

Auditorium Б3, 1st and 2nd floors of the main building

10.30 – 11.10	**Plenary lecture** ***Yoshinari Miyamoto*** *(Japan)* YESTERDAY, TODAY AND TOMORROW CHALLENGES FOR SHS
11.10 – 11.50	**Plenary lecture** ***Andrey Voevodin*** *(USA)* HYBRID SURFACE ENGINEERING TECHNOLOGIES FOR SELF-ADAPTIVE FRICTION AND WEAR BEHAVIOR IN EXTREME ENVIRONMENTS
11.50 – 12.25	**Plenary lecture** ***Mikhail Alymov,*** *O.K. Kamynina (Russia)* ISMAN: NEW RESULTS AND ACHIEVEMENTS
12.25 – 13.00	**Plenary lecture** ***Evgeny Levashov*** *(Russia)* RECENT ADVANCES AND APPROACHES IN SHS OF HIGH-TEMPERATURE MATERIALS (OVERVIEW)
13.00 – 14.15	**Lunch**

Session 1: Combustion theory and modeling

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Florence Baras, Jincheng Du

14.15 – 14.45	**Keynote lecture** ***Florence Baras****, O. Politano, A. Fourmont, S. Le Gallet, A. Nepapushev, A. Sedegov, S. Vadchenko, A. Rogachev (France, Russia)* AN OVERVIEW OF ATOMISTIC APPROACHES IN SHS PROCESSES
14.45 – 15.15	**Keynote lecture** ***Jincheng Du*** *(USA)* EFFECT OF DOPING ON THE ALLOY CHEMISTRY OF NICKEL BASED SUPER ALLOYS FROM COUPLING FIRST PRINCIPLES CALCULATIONS AND ADVANCED CHARACTERIZATIONS
15.15 – 15.35	*O. Politano, S.A. Rogachev, F. Baras, A.S. Rogachev (France, Russia)* MILLION-ATOM MOLECULAR DYNAMICS SIMULATIONS OF EXPLOSIVE CRYSTALLIZATION IN AMORPHOUS CuTi THIN FILMS
15.35 – 15.55	*V.G. Prokof'ev (Russia)* 2D DISCRETE MODEL OF THE MULTICOMPONENT SHS PROCESS
15.55 – 16.10	**Coffee Break**
16.10 – 16.40	**Keynote lecture** ***Hayk Nersisyan,*** *W.B. Kim, J.H. Lee (Korea)* MORPHOLOGICAL DIVERSITY OF METAL NITRIDES CRYSTALS: SYNTHESIS, CHARACTERIZATION AND THEORETICAL MODELING
16.40 – 17.00	*S.A. Rogachev (Russia)* MOLECULAR DYNAMICS SIMULATION OF REFRACTORY COMPOUNDS AND METHODS OF THEIR SYNTHESIS
17.00 – 17.20	*V.V. Grachev (Russia)* LIMITS OF COMBUSTION WAVES PROPAGATION AT NATURAL INFILTRATION OF A GASEOUS REAGENT
17.20 – 17.40	*L.S. Stelmakh, A.M. Stolin, P.M. Bazhin (Russia)* FEATURES OF GRAIN STRUCTURE AT SHS EXTRUSION FOR MATERIAL BASED ON TiC + Co
18.00 – 20.00	**WELCOME PARTY, UNIVERSITY CAFÉ**

Session 2: Powder materials

Auditorium Б4, 1st and 2nd floors of the main building

Session Chairmen: Osamu Odawara, Alexander Mukasyan

14.15 – 14.45	**Keynote lecture** ***Alexander Mukasyan*** *(USA)* SHS CERAMICS: HISTORY AND RECENT ADVANCES
14.45 – 15.15	**Keynote lecture** ***Osamu Odawara*** *(Japan)* ADVANCED COMBUSTION SYNTHESIS FOR HIGH PERFORMANCE MATERIALS AND POWER SYSTEMS DEVELOPMENTS
15.15 – 15.35	*T. Ergul, U. Cinarli, M. Bugdayci, A. Turan (Turkey)* SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS OF TITANIUM CARBIDE
15.35 – 15.55	*G.A. Pribytkov, M.G. Krinitcyn, V.V. Korzhova, I.A. Firsina (Russia)* SYNTHESIS AND APPLICATION OF SHS COMPOSITE POWDERS OF THE "TITANIUM BORIDE–TITANIUM" SYSTEM
15.55 – 16.10	**Coffee Break**
16.10 – 16.40	**Keynote lecture** ***Alexander Ilyushenko****, P.A. Vityaz, T.L. Talako, A.I. Letsko (Belarus)* SHS POWDERS FOR THERMAL SPRAY COATINGS
16.40 – 17.00	*A.V. Liushinskii (Russia)* PRODUCED AND PROPERTIES OF UFP OF NICKEL FOR DIFFUSION WELDING OF HETEROGENEOUS MATERIALS
17.00 – 17.20	*A.N. Astapov, E.A. Levashov, I.P. Lifanov, Yu.S. Pogozhev, A.Yu. Potanin, M.V. Prokofiev (Russia)* HEAT-RESISTANT COATINGS FORMED FROM SHS POWDER OF THE $ZrSi_2$–$MoSi_2$–ZrB_2 SYSTEM FOR CARBON COMPOSITES
18.00 – 20.00	**WELCOME PARTY, UNIVERSITY CAFÉ**

DAY 2: TUESDAY, SEPTEMBER 17, 2019

Session 3: Refractory and ultra-high-temperature materials

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Roberto Orrù, Dominique Vrel

9.00 – 9.30	**Keynote lecture** ***Roberto Orrù**, G. Tallarita, R. Licheri, G. Cao (Italy)* COMBINATION OF SHS AND SPS PROCESSING ROUTES FOR ADVANCED CERAMICS
9.30 – 9.50	*S. Dine, V. Kentheswaran, G. Dirras, D. Vrel (France)* SHS AND SPS CONSOLIDATION OF COMPLEX COMPOSITIONAL REFRACTORY ALLOYS
9.50 – 10.10	*V.V. Kurbatkina, E.I. Patsera, E.A. Levashov (Rassia)* ADVANCED ULTRA-HIGH-TEMPERATURE COMPOSITES BASED ON SHS - SINGLE PHASE SOLID SOLUTION $(Hf,Ta)B_2$
10.10 – 10.30	*D.O. Moskovskikh, A.S. Mukasyan (Russia, USA)* REACTION SPARK PLASMA SINTERING OF BINARY AND HIGH-ENTROPY CARBIDES
10.30 – 10.50	*V.A. Shcherbakov, A.N. Gryadunov, S.G. Vadchenko, M.I. Alymov (Russia)* EXOTHERMIC SYNTHESIS AND CONSOLIDATION OF Ta_4ZrC_5 COMPOSITE
10.50 – 11.10	*A.Yu. Potanin, S. Vorotilo, Yu.S. Pogozhev, P.A. Loginov, E.A. Levashov (Russia)* THE KINETICS AND MECHANISMS OF HIGH-TEMPERATURE OXIDATION OF HEAT-RESISTANT $MoSi_2$–MoB–HfB_2 CERAMICS PRODUCED BY HYBRID SHS + HP TECHNOLOGY
11.15 – 11.30	**Coffee Break**
11.30 – 11.50	*V.S. Buinevich, A.A. Nepapushev, G.V. Trusov, D.O. Moskovskikh, A.S. Rogachev, A.S. Mukasyan (Russia, USA)* SPARK PLASMA SINTERING AND SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS OF ULTRA-HIGH TEMPERATURE CERAMICS Hf–C–N
11.50 – 12.10	*S.A. Kuznetsov, V.S. Dolmatov, A.R. Dubrovskiy, Yu.V. Stulov (Russia)* SYNTHESIS OF METAL-LIKE REFRACTORY COMPOUNDS AND ULTRA-HIGH-TEMPERATURE MATERIALS IN MOLTEN SALTS
12.10 – 12.30	*E.I. Patsera, S.A. Vorotilo, V.V. Kurbatkina, E.A. Levashov (Russia)* PRODUCTION OF ULTRA-REFRACTORY CARBIDES OF VARIOUS STOICHIOMETRIES IN THE SYSTEMS Ta–Zr–C, Ta–Hf–C BY SHS
12.30 – 12.50	*S. Dine, F. Bernard, C. Grisolia, N. Herlin, D. Vrel (France)* SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS AND SPARK PLASMA SINTERING OF TUNGSTEN ALLOYS FOR FUSION APPLICATIONS
12.50 – 14.15	**Lunch**

Session 4: SHS in metallurgy, welding, soldering

Auditorium Б4, 1st and 2nd floors of the main building

Session Chairmen: Vladimir Sanin, Onuralp Yücel

9.00 – 9.30	**Keynote lecture** ***Onuralp Yücel***, *Kerem Can Tasyurek, Mehmet Bugdayci, Ahmet Turan (Turkey)* PRODUCTION OF METALS AND ALLOYS THROUGH VACUUM METALLOTHERMIC PROCESS
9.30 – 9.50	*V.I. Yukhvid, D.E. Andreev, Yu.S. Vdovin, S.L. Silyakov, N.V. Sachkova, I.D. Kovalev (Russia)* SHS METALLURGY OF COMPOSITE MATERIALS BASED ON REFRACTORY METALS
9.50 – 10.10	*V.N. Sanin, D.M. Ikornikov, O.A. Golosova, D.E. Andreev, V.I. Yukhvid, S.V. Zherebtsov (Russia)* CENTRIFUGAL CASTING—SHS PROCESS OF THE CAST CoCrFeNiMn-TYPE HIGH-ENTROPY ALLOY HARDENED BY THERMO-MECHANICAL TREATMENT AND THE INTRODUCTION OF SILICON–BORIDE HARDENERS
10.10 – 10.30	*K. Abe, A. Kurniawan, M. Sanada, T. Nomura, T. Akiyama (Japan)* RAPID-HEATING-TYPE COMBUSTION SYNTHESIS OF METALLIC IRON: EFFECTS OF TEMPERATURE AND ATMOSPHERE
10.30 – 10.50	*K.Y. Liu, Y.Y. Li and P.W. Chen (China)* FABRICATION OF TiC–TiB_2 COMPOSITE CERAMIC BY SELF-PROPAGATING HIGH TEMPERATURE SYNTHESIS
10.50 – 11.10	*A.A. Zaitsev, E.A. Levashov, V.I. Vershinnikov, I. Konyashin, E.I. Patsera (Russia, Germany)* NEAR-NANO AND COARSE-GRAIN WC POWDERS OBTAINED BY THE SHS AND CEMENTED CARBIDES ON THEIR BASIS
11.15 – 11.30	**Coffee Break**
11.30 – 12.00	**Keynote lecture** ***Alexander Amosov***, *E.I. Latukhin, A.R. Luts, Yu.V. Titova, A.A. Kuzina, D.A. Maidan (Russia)* APPLICATION OF SHS FOR FABRICATION OF ALUMINUM-MATRIX NANOCOMPOSITES (REVIEW)
12.00 – 12.20	*D.E. Andreev, K.V. Zakharov, D.M. Ikornikov, V.I. Yukhvid, N.Yu. Khomenko (Russia)* GRAVITY-ASSISTED METALLOTHERMIC SHS OF COMPOSITES BASED ON Mo–Ti–Cr–Ni
12.20 – 12.40	*V.V. Sanin, M.R. Filonov, Yu.A. Anikin, V.I. Yukhvid, D.M. Ikornikov (Russia)* SHS BORON-CONTAINING LIGATURES, INTRODUCTION INTO THE MELT AND THE RESEARCH OF INFLUENCE ON THE PROPERTIES OF THE RESULTING ALUMINUM-MATRIX COMPOSITES

12.40 – 13.00	*Xiaoping Cai, Peizhong Feng (China)* PREPARATION OF POROUS NIOBIUM-ALUMINUM INTERMETALLIC BY COMBUSTION SYNTHESIS IN THERMAL EXPLOSION MODE
13.00 – 14.15	**Lunch**

Session 7: Solution combustion synthesis

Auditorium Б2, 1st floor of the main building

Session Chairmen: Khachatur Manukyan, Galina Xanthopoulou

9.00 – 9.30	**Keynote lecture** ***Khachatur Manukyan*** *(USA)* CURRENT STATE AND FUTURE PROSPECTS OF SOLUTION COMBUSTION SYNTHESIS
9.30 – 10.00	**Keynote lecture** ***Galina Xanthopoulou****, O. Thoda, S. Roslyakov, E. Levashov, G. Vekinis (Greece, Russia)* DENDRIC 3-DIMENTIONAL STRUCTURE COMBUSTION, FLAME BIFURCATION IN REPETITIVE EXTINCTION-IGNITION DYNAMICS, LIQUID PHASE SINTERING - A NEW COMPREHENSIVE REACTION MECHANISM FOR SCS IN CONDITIONS OF NANO-SCALE HETEROGENEITY
10.00 – 10.20	*Yongdong Yu, Yongting Zheng, Wanjun Yu, Xiaoyue Su, Bo Liu, Fengyu Lin (China)* SOLID SOLUTION PRECIPITATION MECHANISM AND MICROSTRUCTURE EVOLUTION OF Al_2O_3/ZrO_2 NANOCOMPOSITE CERAMICS
10.20 – 10.40	*S.I. Roslyakov, A.S. Mukasyan, Kh.V. Manukyan (Russia, USA)* SOLUTION COMBUSTION SYNTHESIS OF NANOSTRUCTURED METASTABLE NITRIDES AND INTERMETALLICS
10.40 – 11.00	*G.V. Trusov, A.B. Tarasov, D.O. Moskovskikh, A.S. Rogachev, A.S. Mukasyan (Russia, USA)* METAL FOAMS FABRICATED BY SPRAY SOLUTION COMBUSTION SYNTHESIS AND SPARK PLASMA SINTERING
11.00 – 11.20	*Lorenzo Trombi, Francesco Cugini, Roberto Rosa, Paolo Veronesi, Massimo Solzi, Cristina Leonelli (Italy)* MICROWAVE ASSISTED COMBUSTION SYNTHESIS OF $AlFe_2B_2$
11.20 – 11.35	**Coffee Break**
11.35 – 12.05	**Keynote lecture** ***Pengwan Chen****, C.X. Xu, K.Y. Liu, X. Gao (China)* SOLUTION COMBUSTION SYNTHESIS OF CARBON-BASED POROUS NANOMATERIALS FOR EFFICIENT ELECTROCHEMICAL APPLICATIONS
12.05 – 12.25	*M.K. Zakaryan, A.A. Baldryan, S.L. Kharatyan (Armenia)* W–Ag NANOCOMPOSITE PREPARATION BY COMBINING SCS AND SHS

12.25 – 12.45	*P.A. Miloserdov, V.A. Gorshkov, O.M. Miloserdova, O.A. Golosova (Russia)* SYNTHESIS OF COMPOSITE MATERIALS IN THE Ti–Cr–B SYSTEM FROM MIXTURES BASED ON CALCIUM CHROMATE
12.50 – 14.15	**Lunch**

Session 5: Kinetics and mechanisms of chemical and structure transformations

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Manshi Ohyanagi, Alexander Sytschev

14.15 – 15.00	**Keynote lecture** ***Manshi Ohyanagi,*** *Y. Shimizu, M. Otowaki, K. Shirai (Japan)* EXOTHERMIC HYDROGENATION KINETICS OF Mg WITH CATALYTIC DISSOCIATION OF MOLECULAR HYDROGEN
15.00 – 15.20	*Xinyang Jiao, Peizhong Feng (China)* STUDIES ON THE PORE FORMATION MECHANISM OF POROUS $TiAl_3$ INTERMETALLICS BY COMBUSTION SYNTHESIS
15.20 – 15.40	*A.I. Kirdyashkin, R.M. Gabbasov (Russia)* PLASMA-CHEMICAL ACTIVATION OF SHS IN EXTERNAL ELECTRIC FIELDS
15.40 – 16.00	*A.Yu. Lashkov, A.D. Bulanov, O.Yu. Troshin (Russia)* FILTRATION COMBUSTION OF SiF_4 AND CaH_2 IN VERTICAL FLOW REACTOR
16.00 – 16.15	**Coffee break**
16.15 – 16.35	*M.Kh. Ziatdinov (Russia)* COMBUSTION SYNTHESIS OF COMPOSITION ALLOYS
16.35 – 16.55	*Z. Aslamazashvili, G. Oniashvili, G. Zakharov, G. Tavadze, M. Chikhradze (Georgia)* THE KEY ROLE OF STRUCTURAL AND PHASE COMPOSITION FOR FORMATION GRADED MATERIALS BY SHS-COMPACTION TECHNOLOGY
16.55 – 17.15	*A.E. Sytschev, N.A. Kochetov, A.S. Shchukin, M.L. Busurina, A.V. Aborkin (Russia)* COMBUSTION SYNTHESIS AND STRUCTURE FORMATION IN Ni–Al–C SYSTEM
17.15 – 17.35	*T.G. Akopdzhanyan, A.A. Kondakov, N.A. Kochetov, S.I. Rupasov, A.P. Kozlova, A.V. Bondarev (Russia)* STRUCTURE AND PHASE FORMATION IN ALUMINUM OXYNITRIDE DURING SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS
17.35 – 17.55	*M.L. Busurina, A.E. Sytschev, D.Yu. Kovalev, N.V. Sachkova, A.V. Karpov, A.N. Gryadunov, V.A. Shcherbakov (Russia)* THERMAL EXPLOSION IN THE 2Co–Ti–Al SYSTEM: COMBUSTION, PHASE FORMATION, AND PROPERTIES

Session 4: SHS in metallurgy, welding, soldering

dedicated to 90th Anniversary of Prof. Ksandopulo Georgii Ivanovich

Auditorium Б4, 1st and 2nd floors of the main building

Session Chairman: Zulkhair Mansurov

14.15 – 14.45	**Keynote lecture** ***Georgii Ksandopulo*** *(Kazakhstan)* SYNTHESIS OF METAL OXIDE RADICALS IN ROTATING REACTOR WITH ALUMINOTHERMIC FLAME
14.45 – 15.20	**Keynote lecture** ***Zulkhair Mansurov,*** *N.N. Mofa, B.S. Sadykov, A.Ye. Bakkara (Kazakhstan)* THE ROLE OF MECHANOCHEMICAL TREATMENT IN THE DEVELOPMENT OF SH-SYNTHESIS AND OBTAINING COMPOSITION SYSTEMS OF DIFFERENT PURPOSES
15.20 – 15.40	*T.A. Ketegenov (Kazakhstan)* HISTORY AND DEVELOPMENT PROSPECTS OF THE KAZAKHSTAN SCHOOL OF CHEMICAL PHYSICS
15.40 – 16.00	*G. Xanthopoulou, G. Ksandopulo (Greece, Kazakhstan)* PIONEER RESEARCH AND BREAKTHROUGHS CPI IN THE FIELD OF SHS CATALYSTS, PIGMENTS AND TPS FOR SPACE APPLICATION THAT INITIATED NEW COMBUSTION SYNTHESIS RESEARCH DIRECTIONS IN THE WORLD
16.00 – 16.15	**Coffee break**
16.15 – 16.35	*B.S. Sadykov, A.Ye. Bakkara, L. Galfetti, K.S. Zhamanbalinova, N. Meirbekov, N.N. Mofa (Kazakhstan)* ENERGY INTENSITY OF SOLID FUEL SYSTEMS WITH MECHANICALLY ACTIVATED ALUMINUM
16.35 – 16.55	*A.N. Baideldinova, S. Tolendiuly, L.V. Mukhina, G.I. Ksandopulo (Kazakhstan)* EXPERIMENTAL STUDY OF THE EFFECT OF ATTACKING METAL PARTICLES ON MAGNESIUM, BORON, ALUMINUM, MOLYBDENUM OXIDES
16.55 – 17.15	*A.Ye. Bakkara, N.N. Mofa, B.S. Sadykov, Z.L. Sultanova, Z.A. Mansurov (Kazakhstan)* THE EFFECT OF MAGNESIUM ON THE COMBUSTION PROCESS OF GAS GENERATOR MIXTURES
17.15 – 17.35	*N.N. Mofa, B.S. Sadykov, G. Kaiypbek, T.B. Osserov, D. Shaltykova (Kazakhstan)* SH-SYNTHESIS OF CERAMIC MATERIALS BASED ON PRE-ACTIVATED AND MODIFIED SYSTEMS
17.35 – 17.55	*V.N. Kolosov, M.N. Miroshnichenko, T.Yu. Prokhorova (Russia)* PREPARATION OF CHROMIUM POWDER AND ITS COMPOSITE WITH TUNGSTEN FROM COMPLEX OXIDES BY MAGNESIUM VAPOURS REDUCTION

Round Tables

Auditorium Б2, 1st floor of the main building

Moderator: Marine Melkonyan

14.15 – 16.00	**Round table 1:** **"The international dialog on environmental, health and safety issues in metallurgy and mining"**
16.00 – 16.15	**Coffee break**
16.15 – 18.00	**Round table 2:** **"Materials Science and Engineering vs. Mega Science Project"**

DAY 3: WEDNESDAY, SEPTEMBER 18, 2019

Session 6: SHS in thin films and surface engineering

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Dmitry Shtansky, Samir Aouadi

9.00 – 9.30	**Keynote lecture** ***Dmitry Shtansky*** *(Russia)* SHS IN SURFACE ENGINEERING
9.30 – 10.00	**Keynote lecture** ***Samir Aouadi*** *(USA)* ADAPTIVE COATINGS FOR HIGH TEMPERATURE APPLICATIONS
10.00 – 10.20	*K.A. Kuptsov, A.N. Sheveyko, D.A. Sidorenko, D.V. Shtansky (Russia)* DEVELOPMENT OF FUNCTIONALLY GRADED WEAR-RESISTANT WC/a-C COATINGS BY A COMBINATION OF PULSED ARC EVAPORATION AND ELECTROSPARK DEPOSITION
10.20 – 10.40	*S.V. Fedorov, M.P. Kozochkin, T.H. Maung, M.H. Swe (Russia)* VIBROACOUSTIC MONITORING OF THE INTERMETALLIC PHASES FORMATION IN SURFACE ALLOYING USING ELECTRON-BEAM TECHNOLOGY
10.40 – 11.00	*Ph.V. Kiryukhantsev-Korneev, T.A. Sviridova, N.V. Shvindina, E.A. Levashov (Russia)* HIGH-TEMPERATURE Mo–(Zr,Hf)–Si–B COATINGS DEPOSITED USING SHS-PRECURSORS
11.00 – 11.20	*E.I. Zamulaeva, A.Y. Potanin, A.N. Sheveyko, N.A. Gloushankova, N.V. Shvindina, S.G. Ignatov, E.A. Levashov, D.V. Shtansky (Russia)* STRUCTURE AND PROPERTIES OF ANTIBACTERIAL YET BIOCOMPATIBLE Ag-DOPED MULTICOMPONENT COATINGS OBTAINED BY PULSED ELECTROSPARK DEPOSITION USING SHS-ELECTRODES
11.20 – 11.35	**Coffee break**
11.35 – 11.55	*M.I. Petrzhik, A.E. Kudryashov, E.I. Zamulaeva (Russia)* REACTIVE PHASE FORMATION BY ELECTROSPARK DEPOSITION
11.55 – 12.15	*R.P. Golodok, V.V. Savich, S.V. Poberezhny, O.O. Kuznechik, E.G. Grigoriev (Belarus)* GENERATION OF SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS ON THE SURFACE OF SINTERED TITANIUM SPONGE POROUS SAMPLES IN A THIN LAYER BY ELECTRIC IMPULSE
12.15 – 12.35	*S.M. Zharkov, R.R. Altunin, E.T. Moiseenko (Russia)* SOLID-STATE REACTIONS IN Al-BASED MULTILAYER NANOSYSTEMS

12.35 – 12.55	*A.V. Bondarev, A.N. Sheveyko, M.N. Antonyuk, T. Polcar, E.A. Levashov, D.V. Shtansky (Russia, Czech Republic)* NANOCOMPOSITE Si–Ta–C–N–(Ag) COATINGS FOR WIDE TEMPERATURE RANGE APPLICATIONS
13.00 – 14.00	**Lunch**
14.00 – 14.20	*V.A. Ponomarev, A.N. Sheveyko, S.G. Ignatov, J. Polčak, D.V. Shtansky (Russia)* ANTIBACTERIAL PROPERTIES OF TiCaPCON COATING DOPED WITH Pt AND Fe DEPOSITED USING SHS TARGETS
14.20 – 14.40	*P.M. Bazhin, A.M. Stolin, A.S. Konstantinov, A.P. Chizhikov, A.D. Prokopets (Russia)* PRODUCTION OF LAYERED COMPOSITE MATERIALS BASED ON TITANIUM BORIDES
14.40 – 15.00	*R.G. Abdulkarimova, A.J. Seidualiyeva, K. Kamunur (Kazakhstan)* SH-SYNTHESIS OF POWDERS BASED ON TRANSITION METAL BORIDES
15.15 – 15.45	*Walk from the main building of the University to the pier «Krymsky Bridge»*
16.00 – 19.00	*Round Table: "30th Anniversary of the SHS-Center MISiS-ISMAN, development of educational trajectories", Social events* ***(Moscow River Boat Tour)***

Session 8: Mechanically activated systems

Auditorium Б4, 1st and 2nd floors of the main building

Session Chairmen: Nikolay Lyakhov, Edward Dreizin

9.00 – 9.30	**Keynote lecture** ***Nikolay Lyakhov****, M. Korchagin, T. Grigorieva (Russia)* MA SHS AS A KINETIC PHENOMENON
9.30 – 10.00	**Keynote lecture** ***Edward Dreizin****, M. Schoenitz, K.L. Chintersingh, M. Mursalat, S.K. Valluri, D. Hastings (USA)* NEW MATERIALS PREPARED BY ARRESTED REACTIVE MILLING AND MECHANISMS OF THEIR IGNITION AND COMBUSTION
10.00 – 10.30	**Keynote lecture** ***Alexander Rogachev****, S.G. Vadchenko, N.A. Nepapushev, D.O. Moskovskikh (Russia)* HIGH ENERGY BALL MILLING OF SHS MIXTURES: MECHANISMS AND OPPORTUNITIES
10.30 – 10.50	*A.A. Nepapushev, D.O. Moskovskikh, V.S. Buinevich, S.G. Vadchenko, A.S. Rogachev (Russia)* REACTIVE ROUNDED Ti/Al COMPOSITE POWDERS PRODUCED BY HIGH-ENERGY BALL MILLING FOR SELECTIVE LASER MELTING TECHNOLOGY

10.50 – 11.10	*Aleksei Sedegov, Stepan Vorotilo, Vadim Tsybulin, Kirill Kuskov, Dmitriy Moscovskikh, Sergey Vadchenko, Alexander Mukasyan (Russia, USA)* THE STUDY OF HIGH-ENTROPY CERAMICS $Hf_{0.2}Ta_{0.2}Ti_{0.2}Nb_{0.2}Mo_{0.2}C$ and $Hf_{0.2}Ta_{0.2}Ti_{0.2}Nb_{0.2}Zr_{0.2}C$ OBTAINED BY SHS AND SPARK PLASMA SINTERING
11.15 – 11.30	**Coffee break**
11.30 – 11.50	*G.A. Pribytkov, A.V. Baranovskii, M.G Krinitsyn, V.V. Korzhova, E.N. Korosteleva (Russia)* SELF-PROPAGATING HIGH TEMPERATURE SYNTHESIS OF METAL MATRIX COMPOSITE POWDERS FROM MECHANOACTIVATED POWDER MIXTURES
11.50 – 12.10	*N.F. Shkodich, M. Spasova, M. Farle, D.Yu. Kovalev, A.A. Nepapushev, K.V. Kuskov, Yu.S. Vergunova, Yu.B. Scheck, A.S. Rogachev (Russia)* STRUCTURAL EVOLUTION AND MAGNETIC PROPERTIES OF HIGH ENTROPY CuCrFeTiNi ALLOYS PREPARED BY MECHANICAL ALLOYING AND SPS
12.10 – 12.30	*V.Yu. Filimonov, M.V. Loginova, S.G. Ivanov, A.A. Sitnikov, V.I. Yakovlev, A.V. Sobachkin, A.Z. Negodyaev, A.Yu. Myasnikov, A.V. Gradoboev, B.P. Tolochko, M.R. Sharafutdinov (Russia)* THE PROCESSES OF STRUCTURE FORMATION IN THE MECHANICALLY ACTIVATED POWDER MIXTURE Ti + Al SUBJECTED TO γ-IRRADIATION
12.30 – 12.50	*N.A. Kochetov, A.S. Rogachev, A.S. Shchukin, S.G. Vadchenko, I.D. Kovalev (Russia)* MECHANICAL ALLOYING WITH PARTIAL AMORPHIZATION OF Fe–Cr–Co–Ni–Mn MULTICOMPONENT POWDER MIXTURE AND ITS SPARK PLASMA SINTERING FOR COMPACT HIGH-ENTROPY MATERIAL PRODUCTION
13.00 – 14.15	**Lunch**
14.15 – 14.35	*T.V. Fadeev, A.K. Abkaryan, G.M. Zeer, M.N. Volochaev, I.V. Nemtsev, L.I. Kveglis (Russia)* STRUCTURAL-PHASE TRANSFORMATIONS IN THE LOCALIZATION ZONES OF PLASTIC DEFORMATION OF Ti–Al COMPOSITE
14.35 – 14.55	*M.V. Lemesheva, Yu.S. Pogozhev, A.Yu. Potanin, S.I. Rupasov, V.I. Vershinnikov, E.A. Levashov (Russia)* COMBUSTION SYNTHESIS AND CONSOLIDATION OF $(Zr/Hf)B_2$–$(Zr/Hf)Si_2$–$MoSi_2$ POWDER CERAMICS FOR HIGH-TEMPERATURE PROTECTIVE COATINGS
15.15 – 15.45	*Walk from the main building of the University to the pier «Krymsky Bridge»*
16.00 – 19.00	*Round table: "30th Anniversary of the SHS-Center MISiS-ISMAN, development of educational trajectories",* *Social events* ***(Moscow River Boat Tour)***

DAY 4: THURSDAY, SEPTEMBER 19, 2019

Session 9: Application and Industrialization

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Vladimir Yukhvid, Jerzy Lis

9.00 – 9.30	**Keynote lecture** ***Ralf Fellenberg*** *(Germany)* TRENDS OF MATERIALS RESEARCH
9.30 – 10.00	**Keynote lecture** ***Jerzy Lis,*** *P. Rutkowski, D. Kata, L. Chlubny, D. Sala (Poland)* LASER TECHNOLOGY IN SYNTHESIS AND PROCESSING OF SHS DERIVED MAX MATERIALS
10.00 – 10.20	*Richard Suchentrunk (Germany)* PUBLISHER SUPPORTS TRANSFER FROM RESEARCH TO APPLICATION
10.20 – 10.40	*E.N. Avdeenko, A.A. Zaitsev, I. Konyashin, E.A. Levashov, D.A. Sidorenko (Russia, Germany)* HARDMETALS WITH HIERARCHICAL AND EXTRA HOMOGENEOUS STRUCTURE FOR A NEW GENERATION MINING TOOLS
10.40 –11.00	*A. Zurnachyan, D. Davtyan, E. Karakhanov, A. Akopyan, R. Mnatsakanyan (Armenia)* APPLICATION of MICROVAWE RADIATION in HETEROGENEOUS CATALYSIS
11.00 – 11.20	*D.A. Sidorenko, P.A. Loginov, E.A. Levashov (Russia)* HYBRID POWDER BINDERS FOR EXTRA WEAR RESISTANT DIAMOND CUTTING TOOLS
11.20 – 11.35	**Coffee break**
11.35 – 11.55	*V.N. Borshch, I.M. Dement'eva (Russia)* SUPPORTED CATALYSTS OF DEEP OXIDATION AND HYDROGENATION BY SELF-PROPAGATING SURFACE SYNTHESIS
11.55 – 12.15	*P.A. Khaptakhanova, S.A. Uspenskii, T.S. Kurkin, A.N. Zelenetskii, S.Yu. Taskaev (Russia)* MULTIFUNCTIONAL BORON NANOPARTICLS: AN ECOLOGICAL METHOD OF PRODUCTION, PROPERTIES
12.15 – 12.35	*M.V. Tsarev, V.V. Mokrushin, K.V. Korshunov, A.M. Shapovalov, A.Yu. Postnikov, I.A. Tsareva, O.Yu. Zabrodina, D.G. Ivanov, Ye.V. Zabavin, A.Ye. Kanunov (Russia)* APPLICATION OF RESISTOMETRY AND IMPEDANCE SPECTROSCOPY METHODS TO STUDY MIXING OF POWDER MIXTURES FOR SHS
12.35 – 12.55	*K. Abe, N. Okinaka, T. Akiyama (Japan)* SELF-PROPAGATING HIGH TEMPERATURE SYNTHESIS OF Fe_2VAl-BASED THERMOELECTRIC MATERIALS
13.00 – 14.15	**LUNCH**

Session 10: Consolidation, hybrid and additive technologies

Auditorium Б4, 1st and 2nd floors of the main building

Session Chairmen: Elazar Gutmanas, Frederic Bernard

9.00 – 9.30	**Keynote lecture** *S. le Gallet,* ***Frederic Bernard*** *(France)* THE MECHANICAL ACTIVATION OF METALLIC POWDER, AN ESSENTIAL ROUTE TO PREPARE DENSE NANOSTRUCTURED MATERIALS BY SPS
9.30 – 10.00	**Keynote lecture** ***Elazar Gutmanas,*** *I. Gotman (Israel)* REACTIVE FORGING – PROCESSING OF DENSE MATERIALS AND PARTS WITH FINE MICROSTRUCTURE BY PRESSURE ASSISTED SHS
10.00 – 10.20	*Peizhong Feng, X. Cai, X. Jiao, Zh. Li, Ch. Sang (China)* POROUS INTERMETALLICS PREPARED BY THERMAL EXPLOSION
10.20 – 10.40	*M. Abedi, D.O. Moskovskikh, A.S. Mukasyan (Russia, USA)* REACTIVE FLASH SPARK PLASMA SINTERING OF ALUMINA REINFORCED BY SILICON CARBIDE NANOCOMPOSITES: PHYSICOCHEMICAL STUDY
10.40 – 11.00	*S. Vorotilo, E.A. Levashov, K. Sidnov, E.I. Patsera (Russia)* SHS OF SOLID SOLUTIONS IN Ta–Zr–C SYSTEM: MACROKINETIC FEATURES, PHASE/STRUCTURE FORMATION, AND PHASE STABILITY
11.15 – 11.30	**Coffee break**
11.30 – 12.00	*D.E. Andreev, Yu.S. Vdovin, V.I. Yukhvid (Russia)* FORMATION OF Mo/Nb/Si/B CAST COMPOSITE BY SHS IN CONDITIONS OF ARTIFICIAL GRAVITY
12.00 – 12.20	*Yu.Yu. Kaplanskii, E.A. Levashov, Zh.A. Sentyurina, P.A. Loginov, A.V. Korotitskiy, E.I. Patsera (Russia)* PRODUCTION OF SPHERICAL MICROPOWDER OF THE HIGH-TEMPERATURE STRENGHT NiAl-BASED ALLOY USING COMBUSION SYNTHESIS AND THEIR APPLICATION IN THE SELECTIVE LASER MELTING TECHNOLOGY
12.20 – 12.40	*G. Tavadze, T. Namicheishvili, G. Oniashvili, A. Tutberidze, Z. Aslamazashvili, G. Zakharov (Georgia)* PECULIARITIES OF TECHNOLOGICAL PARAMETERS OF SHS-ELECTRICAL ROLLING
12.40 – 13.00	*Yu.S. Pogozhev, M.V. Lemesheva, A.Yu. Potanin, S.I. Rupasov, V.I. Vershinnikov, E.A. Levashov (Russia)* HIERARCHICALLY-STRUCTURED HIGH-TEMPERATURE ZrB_2–MoB–$MoSi_2$ CERAMICS PRODUCED BY DIFFERENT SHS ROUTES AND SUBSEQUENT HP
13.00 – 14.15	**Lunch**
14.15 – 14.35	*F.F. Galiev, I.V. Saikov, M.I. Alymov, V.D. Berbentsev, A.V. Gulyutin, V.I. Bugakov, N.V. Sachkova, S.V. Konovalikhin (Russia)* HIGH TEMPERATURE GAS EXTRUSION OF POWDER MIXTURE Ni + Al

14.35 – 14.55	*D.A. Permin, S.S. Balabanov, E.M. Gavrishchuk, A.V. Novikova, Ye.E. Rostokina, S.V. Filofeev, V.A. Koshkin (Russia)* RARE EARTH OXIDES TRANSPARENT CERAMICS BASED ON THE SHS-DERIVED POWDERS
14.55 – 15.15	*A.M. Stolin (Russia)* PRODUCTION OF COMPOSITE CERAMIC MATERIALS AND PRODUCTS BY COMBINED USE OF SHS AND HIGH-TEMPERATURE SHEAR DEFORMATION
15.15 – 15.35	*Weimin Wang, Zhixiao Zhang, Zhengyi Fu, Hao Wang, Jingyong Zhang, Wei Ji (China)* ULTRAFINE-GRAINED BORON CARBIDE CERAMICS FABRICATED VIA ULTRAFAST SHS-QP SINTERING ASSISTED BY HIGH-ENERGY BALL MILLING
15.35 – 17.00	**Poster Session**
17.00 – 18.00	*Transfer to the banquet venue*
18.00 – 21.00	***Banquet***

Session 11: Functional materials: bio, catalytic, energetic, magnetic, electronics, optics

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Jan Puszynski, Hayk Nersisyan

14.15 – 14.45	**Keynote lecture** ***Jan Puszynski*** *(USA)* SELF-SUSTAINING REACTIONS AT NANOSCALE
14.45 – 15.05	*K. Benzeşik, A. Turan, O. Yücel (Turkey)* VOLUME COMBUSTION SYNTHESIS OF Li_4SiO_4
15.05 – 15.25	*A.O. Semenov, M.S. Kuznetsov, O.Yu. Dolmatov (Russia)* PEROVSKITE-LIKE MATRIX FOR IMMOBILIZATION OF HIGH-LEVEL RADIOACTIVE WASTE PRODUCED BY SHS METHOD
15.25 – 15.45	*A. Maznoy, A. Kirdyashkin, V. Kitler, N. Pichugin, V. Salamatov (Russia)* SHS OF MACROPOROUS NiAl ALLOYS USED IN ADVANCED RADIANT BURNERS
15.45 – 16.05	*R. Rosa, L. Trombi, C. Miglioli, F. Cugini, A. Casagrande, C. Leonelli, P. Veronesi (Italy)* THE ROLE OF MICROWAVES IN THE IGNITION OF LOW-EXOTHERMIC SYSTEMS: THE CASE OF Ni–Ti INTERMETALLICS
16.05 – 17.00	**Poster Session**
17.00 – 18.00	*Transfer to the banquet venue*
18.00 – 21.00	***Banquet***

DAY 5: FRIDAY, SEPTEMBER 20, 2019

Session 11: Functional materials: bio, catalytic, energetic, magnetic, electronics, optics

Auditorium Б3, 1st and 2nd floors of the main building

Session Chairmen: Yury Pogozhev, Olga Kamynina

9.00 – 9.30	**Keynote lecture** ***Kwong-Yu Chan***, *Albert A. Voskanyan, Ching-Kit Ho, Liubin Wang, Wai Yu Lam, Chi-Ying V. Li, and Bin Qin (China)* COMBUSTION SYNTHESIZED MATERIALS FOR ELECTROCHEMICAL APPLICATIONS
9.30 – 9.50	*O.K. Kamynina, S.G. Vadchenko, A.S. Shchukin, V.G. Salamatov (Russia)* Ta-CONTAINING MATERIALS BY SHS
9.50 – 10.10	*Yonggao Yan, Tiezheng Hu, Xianli Su, Wei Liu, Xinfeng Tang (China)* ONE-STEP ULTRA-RAPID FABRICATION OF BULK THERMOELECTRIC MATERIALS VIA SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS COMBINED WITH IN-SITU QUICK PRESSING
10.10 – 10.30	*Xianli Su, Yonggao Yan, Xinfeng Tang (China)* HIGH THERMOELECTRIC PERFORMANCE OF P-BISBTE COMPOUNDS PREPARED BY ULTRA-FAST THERMALLY INDUCED REACTION
10.30 – 10.50	*Xinfeng Tang, Xianli Su, Yonggao Yan (China)* SHS SYNTHESIS OF THERMOELECTRIC MATERIALS: THERMODYNAMIC CRITERION FOR COMBUSTION SYNTHESIS
10.50	**CLOSING CEREMONY**

Poster session

2nd floor of the main building, in front of auditoriums Б3, Б4

1. THE Cr-B-C-N FILMS PRODUCED BY PULSED CATHODE-ARC EVAPORATION (P-CAE) OF THE CrB_2 ROD MANUFACTURED USING SHS-COMPACTING
   Ph.V. Kiryukhantsev-Korneev (Russia)

2. STRUCTURE AND PROPERTIES OF h-ZrB_2 AND h-ZrB_2/a-BN COATINGS DEPOSITED BY MAGNETRON SPUTTERING OF THE SHS-TARGETS
   Ph.V. Kiryukhantsev-Korneev, A. Kozlova, N.S. Kozlova, E.A. Levashov (Russia)

3. THE EXCLUSIVE ROLE OF THE INITIATION TEMPERATURE IN THE START OF NANOSCALE SOLID-STATE REACTIONS
   V.G. Myagkov (Russia)

4. EFFECT OF THERMOCAPILLARY FLOW OF MELT ON COMBUSTION OF A BINARY GASLESS MIXTURE
   V.G. Prokof'ev, A.I. Kirdyashkin, V.D. Kitler, O.V. Lapshin (Russia)

5. FABRICATION OF Al-AlN NANOCOMPOSITE BY POWDER METALLURGY METHOD USING ALN NANOPOWDER OF SHS-AZ BRAND
   A.A. Kuzina, A.P. Amosov, D.A. Zakharov, Yu.V. Titova (Russia)

6. FABRICATION OF ALUMINUM-CERAMIC SKELETON COMPOSITES BASED ON TITANIUM ALUMINIDE CARBIDE USING SHS PROCESS
   E.R. Umerov, A.P. Amosov, E.I. Latukhin, P.E. Kichaev, V.A. Novikov (Russia)

7. STRUCTURE AND PROPERTIES OF ALLOYED COMPOSITES Al-TiC, FABRICATED BY SHS METHOD
   A.R. Lutz, A.P. Amosov, E.I. Latukhin, A.D. Rybakov, S. I. Shipilov (Russia)

8. SYNTHESIS OF SHS MEMBRANES BASED ON MICA-LIKE STRUCTURE MATERIALS FOR LIQUID AND GAS FILTRATION
   V.I. Uvarov, A.R. Kachin, V.E. Loryan, V.S. Shustov, M.V. Tsodikov (Russia)

9. APPLICATION OF SHS FOR PRODUCTION OF COMPOSITE CERAMIC CATHODES FOR PVD OF HIGH-TEMPERATURE PROTECTIVE Mo-(Hf/Zr)-Si-B COATINGS
   A.Yu. Potanin, Ph.V. Kiryukhantsev-Korneev, S.I. Rupasov, Yu.S. Pogozhev, E.A. Levashov (Russia)

10. HIGH-TEMPERAURE SYNTHESIS OF CAST CERAMIC MATERIALS BASED ON THE Cr_2AlC MAX-FHASE IN LAYERED AND MIXED SYSTEMS
    V.A. Gorshkov, P.A. Miloserdov, V.I. Yukhvid, N.Yu. Khomenko, N.V. Sachkova (Russia)

11. SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS OF α-Si_3N_4 WITH PARTICIPATION OF SODIUM HALOGENIDES
V.V. Zakorzhevsky, N.I. Mukhina, I.D. Kovalev (Russia)

12. SYNTHESIS OF MAX PHASE Ti_2AlN BY SPARK PLASMA SINTERING OF Ti/AlN COMPOSITE POWDERS OBTAINED BY MECHANICAL ACTIVATION
V.G. Gilev, M.N. Kachenyuk, A.A. Smetkin, S.A. Oglezneva (Russia)

13. NONSTATIONARY COMBUSTION OF LAYERED HETEROGENEOUS SYSTEMS
S.V. Kostin, P.M. Krishenik, S.A. Rogachev, A.E. Sytschev (Russia)

14. STRUCTURE AND PROPERTIES OF BORON CARBIDE PRODUCED BY SHS AND MECHANOCHEMICAL SYNTHESIS: A COMPARATIVE STUDY
Zh.V. Eremeeva, S. Vorotilo, V.S. Panov, L.V. Myakisheva, A.I. Lizunov, A.A. Nepapushev, D.A. Sidorenko, D.Y. Mishunin (Russia)

15. THE INITIATION TEMPERATURES IN NANOTHERMITE REACTIONS
V.G. Myagkov (Russia)

16. HARD-MAGNETIC MATERIAL FROM A MECHANOACTIVATED SPHERICAL POWDER OF THE ALLOY 25ХК15ЮБ
V.A. Zelensky, V.S. Shustov, A.B. Ankudinov, I.M. Milyaev, M.I. Alymov (Russia)

17. CAPACITOR GRADE POWDERS FROM SCRAP OF TANTALUM CAPACITORS PRODUCTS
V.M. Orlov, T.Yu. Prokhorova, E.N. Kiselev (Russia)

18. HEAT-RESISTANT PHOSPHATE MATERIALS IN SELF-PROPAGATING EXOTHERMIC SYNTHESIS MODE
Ch.G. Pak, V.M. Batrashov, G.A. Koshkin, K.V. Sokolova (Russia)

19. STRUCTURE FORMATION AT CONSECUTIVE PORTION PACKING OF MONODISPERSED GRANULES IN SQUARE MATRICES WITH SMOOTH AND PROFILED BOTTOM
M.A. Ponomarev, V.E. Loryan (Russia)

20. SYNTHESIS OF THE Ti_2AlC AND Ti_3AlC_2 MAX PHASE WITH A REDUCTION STEP VIA COMBUSTION OF A TiO_2 + Mg + Al + C MIXTURE
V.I. Vershinnikov, D.Yu. Kovalev (Russia)

21. KINETIC MEASUREMENTS FOR SOLUTION COMBUSTION SYNTHESIS PROCESSES
N. Amirkhanyan, S.L. Kharatyan, K.V. Manukyan (Armenia, USA)

22. FORMATION OF TiC/C LAYER ON Ti ALLOYS BY A SIMULTANEOUS ELECTRO-SPARK AND ARC EVAPORATION TREATMENT WITH GRAPHITE ELECTRODE
A.N. Sheveyko, K.A. Kuptsov, A.E. Kudryashov, D.V. Shtansky (Russia)

23. COMBUSTION IN OILY COPPER WASTE-NiO-NH_4NO_3 SYSTEM & SYNTHESIS OF Cu-Ni ALLOY
H.A. Mahmoudi, L.S. Abovyan, V.V. Vardapetyan, S.L. Kharatyan (Armenia)

24. AN X-RAY POWDER DIFFRACTION STUDY OF NEW CRYSTAL $NI_{3.35}W_{9.65}C_4$
S.V. Konovalikhin, N.Yu. Khomenko, I.I. Chuev, S.A. Guda, S.L. Silyakov, D.Yu. Kovalev (Russia)

25. EVOLUTION OF THE STRUCTURAL CONDITION OF REACTION POWDER MIXTURES OF THE Ti – Ni SYSTEM UNDER MECHANICAL ACTIVATION. THEORETICAL ESTIMATES BASED ON EXPERIMENTAL STUDIES
O.A. Shkoda, O.V. Lapshin (Russia)

26. SHOCK COMPACTION AND SINTERING OF Ni POWDERS: INFLUENCE OF Y_2O_3–CoO CONTAINING OXIDE FILMS
O.L. Pervukhina, A.S. Shishkina (Russia)

27. CLAD POWDERS BY COMBINED USE OF METAL REDUCTION AND HIGH-ENERGY BALL MILLING IN SALT SOLUTIONS: THEIR PREPARATION AND IGNITION
S.G. Vadchenko (Russia)

28. METALLOTHERMIC PRODUCTION OF FeCo
M. Bugdayci, A. Turan (Turkey)

29. SYNTHESIS AND CHARACTERIZATION OF BN/Pt AND BN/Au NANOHYBRIDS AS PERSPECTIVE CATALYSTS
I.N. Volkov, A.M. Kovalkii, D.V. Shtansky (Russia)

30. Fe, Ti AND Ni ALUMINIDS FOR MODIFICATION OF POWDER ANTIFRICTION MATERIALS
L.N. Dyachkova, A.Ph. Ilyushchanko, L.Ya.Voronetskaya, N.M. Parnitsky (Belarus)

31. REDUCTION OF OXIDE COMPOUNDS OF TUNGSTEN AND MOLYBDENUM BY CALCIUM VAPOURS
V.N. Kolosov, V.M. Orlov, M.N Miroshnichenko (Russia)

32. FORMATION OF STRUCTURE OF SHS- AND MA-POWDERS Ti_3SiC_2 BY THE SPS
S.A. Oglezneva, T.L. Talako, A.A. Smetkin, A.I. Letsko, M.N. Kachenuk (Russia)

33. PRODUCTION OF ULTRAFINE-GRAINED POWDER COMPOSITES IN BN, B_4C, AND $B_xC_yN_z$ SYSTEMS BY SHS METHOD
Z. Aslamazashvili, G. Zakharov, G. Mikaberidze, M. Chikhradze, G. Tavadze, G. Oniashvili (Georgia)

34. KINETIC FEATURES OF NICKEL OXIDE REDUCTION BY METHANE AT NON ISOTHERMAL CONDITIONS
S. Mamyan, H.A. Chatilyan, S.L. Kharatyan (Armenia)

35. TEMPERATURE MEASUREMENTS OF THE COMBUSTION WAVE BY DYNAMIC SPECTROMETRY
V.G. Salamatov, A.I. Kirdyashkin, V.D. Kitler (Russia)

36. MAGNETIC PROPERTIES OF POWDER Fe-30Cr-(8-16)Co ALLOYS OBTAINED BY LOW-TEMPERATURE SINTERING
S. Ustyukhin, V.A. Zelenskii, I.M. Milyaev, M.I. Alymov, S.A. Zabelin (Russia)

37. SOLUTION COMBUSTION SYNTHESIS OF DOPED Ca_2AlMnO_5 AS A NEW OXYGEN STORAGE MATERIAL
Ayumu Sato, Genki Saito, Keisuke Abe, Takahiro Nomura, Tomohiro Akiyama (Japan)

38. APPLICATION OF SHS-ELECTRODE MATERIALS IN METALLURGY
A.E. Kudryashov, A.V. Makarov, N.I. Repnikov, E.M. Martynov (Russia)

39. APPLICATION OF SHS-ELECTRODE MATERIALS IN PULSED ELECTROSPARK DEPOSITION TECHNOLOGY
A.E. Kudryashov, E.A. Levashov (Russia)

40. FEATURES OF DEPOSITION, STRUCTURE AND PROPERTIES OF ELECTROSPARK COATINGS OF Cr-Al-B-Si, Mo-Si-B AND Zr-Si-B ON NICKEL ALLOY
A.E. Kudryashov, E.A. Levashov, Ph.V. Kiryukhantsev-Korneev, A.N. Sheveiko (Russia)

41. JOINT REDUCTION OF $NiO+WO_3$ OXIDES BY COMBINED Mg/C REDUCER. SYNERGETIC EFFECT
M.K. Zakaryan, Kh.T. Nazaretyan, S.V. Aydinyan, S.L. Kharatyan (Armenia)

42. CHARACTERISTICS OF THE CAPILLARY SPREADING OF COPPER ON THE POROUS FRAMEWORK OF THE PRODUCTS OF THE SHS MIXTURE OF Ni-Al
R.M. Gabbasov, A.M. Shulpekov, V.D. Kitler (Russia)

43. Ni-Al BASED REACTIVE MATERIAL: MECHANICAL PROPERTIES AND FEATURES OF COMBUSTION
S.A. Seropyan, I.V. Saikov, V.G. Salamatov M.I. Alymov, A.V. Dolmatov, P.Yu. Gulyaev (Russia)

44. SYNTHESIS OF NEW MIXED NIOBIUM-TUNGSTEN OXIDE BRONZES
M.K. Kotvanova, I.A. Sologubova (Russia)

45. SHS OF CERAMIC NITRIDE-CARBIDE NANOPOWDER COMPOSITIONS OF Si_3N_4-SiC AND AlN-SiC WITH THE USE OF SODIUM AZIDE AND HALIDE SALTS
Y.V. Titova, A.P. Amosov, D.A. Maidan, G.S. Belova, I.A. Uvarova (Russia)

46. SHS OF BN NANOPOWDER USING BORON-CONTAINING COMPOUNDS AND SODIUM AZIDE
Y.V. Titova, A.P. Amosov, D.A. Maidan, D.R. Safaeva, M.V. Suslov, D.V. Ostroukhov (Russia)

47. ELIMINATION OF SURFACE DEFECTS OF SLM PRODUCTS DUE TO A SYNTHESIS OF NiAl INTERMETALLIC AT ELECTRO-SPARK DEPOSITION OF Al-CONTAINING PRECURSOR
S.K. Mukanov, M.I. Petrzhik, A.E. Kudryashov, E.A. Levashov (Russia)

48. APPLICATION OF HARDMETAL ELECTRODE MATERIALS IN PULSED ELECTROSPARK DEPOSITION TECHNOLOGY
T.G. Penyashki, M.I. Petrzhik, A.E. Kudryashov (Bulgaria, Russia)

49. EVALUATION OF THE HOMOGENEITY OF POWDER COMPOSITIONS FOR SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS USING SPECTRAL ANALYSIS METHODS
V.V. Mokrushin, O.Yu. Zabrodina, A.A. Potekhin, I.A. Tsareva, A.Yu. Postnikov, M.V. Tsarev, P.G. Berezhko (Russia)

50. THE METASTABLE PHASE COMPOSITION OF FeTiB FILMS PRODUCED BY MAGNETRON SPUTTERING
E.N. Sheftel, Ph.V. Kiryukhantsev-Korneev, V.A. Tedzhetov, E.V. Harin, G.Sh. Usmanova (Russia)

51. CONSOLIDATION OF SHS DERIVED SiC BASED COMPOSITES
Z. Pędzich, K. Wojteczko, A. Wojteczko, A. Gubernat, M.M. Bućko (Poland)

52. EXPERIMENTAL 2D MODEL OF HETEROGENEOUS COMBUSTION
S.G. Vadchenko, E.V. Suvorova, A.S. Rogachev (Russia)

53. METALLOTHERMIC SHS OF ALLOYED COMPOSITES BASED ON Co
K.V. Zakharov, D.E. Andreev, V.I. Yukhvid, N.V. Sachkova, N.Yu. Khomenko (Russia)

54. SHOCK-WAVE TREATMENT OF REACTIVE POWDERS
I.V. Saikov, S.G. Vadchenko, I.D. Kovalev, M.I. Alymov (Russia)

55. SYNTHESIS OF POROUS MATERIAL FROM MIXTURES OF BORON, TITANIUM AND NICKEL-CLAD ALUMINUM COMPOSITE POWDERS (NPA75-80)
M.A. Ponomarev, V.E. Loryan (Russia)

56. CHEVREL PHASE COMPOUND NANOMATERIALS SYNTHESIS VIA ULTRA-FAST SELF-PROPAGATING HIGH TEMPERATURE SYNTHESIS REACTION
Milind Pawar, Perena Gouma (USA)

57. SHS IN A MELT OF Al-TiC(B) COMPOSITES
R.M. Nikonova, A.V. Panteleyeva, V.I. Lad`yanov (Russia)

58. STRUCTURE AND PHASE COMPOSITION OF Nb-Si-C-BASED COMPOSITES PREPARED BY SHS METHOD
R.M. Nikonova, N.S. Larionova, V.I. Lad`yanov, B.E. Pushkarev, A.V. Panteleyeva (Russia)

59. INVESTIGATION OF THE EFFECT OF METAL POWDERS ON THE SURFACE OF THE TARGET SUBJECTED TO HIGH ENERGY TREATMENT
E.V. Petrov, V.S. Trofimov (Russia)

60. THERMALLY COUPLED PROCESSES IN A COMPOSITE GRANULAR MIXTURE (Ni+Al)-(Ti+C)
B.S. Seplyarskii, R.A. Kochetkov, T.G. Lisina, N.I. Abzalov (Russia)

61. THE IMPLEMENTATION OF THE CONVECTIVE MODE OF COMBUSTION FOR GRANULAR MIXTURES OF Ti + xC
B.S. Seplyarskii, R.A. Kochetkov, T.G. Lisina, M.I. Alymov (Russia)

62. BEHAVIOURS OF ELECTROTHERMAL EXPLOSION OF TITANIUM-CARBON BLACK MIXTURE UNDER QUASI-ISOSTATIC COMPRESSION
V.A. Shcherbakov, A.V. Shcherbakov (Russia)

63. COMBINED METHOD OF PRODUCING AN ALLOY OF IMMISCIBLE ELEMENTS $Cu_{70}Fe_{30}$ WITH SUBMICRON STRUCTURAL COMPONENTS
V.V. Sanin, M.R. Filonov, Yu.A. Anikin, E.V. Kosticina, V.I. Yukhvid, D.M. Ikornikov (Russia)

64. INTEGRATED PROCESS SHS-REMELTING-PREP FLOW SHEET PRODUCTION OF NiAl-Fe COMPOSITE MICROGRANULES FOR THE ADDITIVE TECHNOLOGY
V.V. Sanin, M.R. Filonov, E.A. Levashov, V.I. Yukhvid, Zh.A. Sentyurina, A.I. Logacheva (Russia)

65. SHS METALLURGY OF THE HARD ALLOY ON THE BASIS OF TUNGSTEN CARBIDE WITH THE NICKEL BOND
S.L. Silyakov, V.I. Yukhvid, N.Yu. Khomenko, T.I. Ignatieva, N.V. Sachkova (Russia)

66. PREPARATION OF Mo-Cu PSEUDOALLOY FROM $CuMoO_4$ PRECURSOR BY COMBINING SOL-GEL METHOD AND SHS
Hasmik Kirakosyan, Khachik Nazaretyan (Armenia)

67. Ni-Cr-Al-Mg CATALYSTS PREPARED BY SOLUTION COMBUSTION SYNTHESI FOR

CATALYTIC REFORMING OF METHANE INTO SYNTHESIS GAS
S.A. Tungatarova, G. Xanthopoulou, G.N. Kaumenova, T.S. Baizhumanova (Kazakhstan, Greece)

68. SHS OF TITANIUM–CHROMIUM CARBIDES: INFLUENCE OF GREEN COMPOSITION
O.A. Golosova, P.A. Miloserdov, V.A. Gorshkov, O.M. Miloserdova (Russia)

69. MILL SCALE WASTE REPROCESSING BY CENTRIFUGAL METALLOTHERMIC SHS FOR PRODUCTION OF CAST FERROALLOYS Fe – (Si; Si-Al; B; B-Al)
D.M. Ikornikov, V.N. Sanin, D.E. Andreev, V.I. Yukhvid (Russia)

70. THERMITE SYNTHESIS OF NANOCOMPOSITE Co-In_2O_3 AND Fe-In_2O_3 FILMS
L.E. Bykova, V.G. Myagkov, V.S. Zhigalov, A.A. Matsynin (Russia)

71. CENTRIFUGAL ASSISTED SHS SURFACING OF CoCrFeNiMnAl_x HIGH ENTROPY ALLOY ON Ti ALLOY SUBSTRATE
V.N. Sanin, D.M. Ikornikov, O.A. Golosova, D.E. Andreev, V.I. Yukhvid (Russia)

72. FILTRATION COMBUSTION OF TITANIUM–ALUMINUM–NITROGEN TERNARY SYSTEM IN FLOW-TYPE REACTOR
I.A. Studenikin, A.V. Linde, A.A. Kondakov, V.V. Grachev (Russia)

73. SOLUTION COMBUSTION SYNTHESIS OF N-DOPED NiO/Ni@C COMPOSITE NANOMATERIALS AND ITS ELECTROCHEMICAL PERFORMANCE AS ANODE MATERIAL OF LITHIUM/SODIUM ION BATTERIES
Y.Y. Li, C.X. Xu, K.Y. Liu, P.W. Chen (China)

74. INFLUENCE OF ADDITIVES ON PHYSICO-MECHANICAL PROPERTIES OF HIGH STRENGTH ALUMINOSILICATE REFRACTORY SHS MATERIALS
R.D. Kapustin (Russia)

75. MODIFYING OF THE STAINLESS STEEL POROUS SURFACE BY NANOSTRUCTURED ALUMINA
V.S. Shustov, V.A. Zelensky, A.B. Ankudinov (Russia)

76. COMPARISON OF THE INFLUENCE OF VIBRATION AND CENTRIFUGAL FORCES FOR THE FORMATION OF HARD ALLOYS
G. Zakharov, Z. Aslamazashvili, G. Tavadze, G. Oniashvili, T. Batsikadze, D. Kvaskhvadze (Georgia)

77. SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS OF HEAT-RESISTANT ELECTRICALLY CONDUCTIVE COATINGS BASED ON Ni-Al AND Ti-Al-C SYSTEM COMPOUNDS
A.M. Shulpekov, R.M. Gabbasov, O.K. Lepakova (Russia)

78. NON-ISOTERMAL SYNTESIS OF NANOLAMINATES
O.K. Lepakova, N.I. Afanasyev, A.M. Shulpekov, V.D. Kitler (Russia)

79. COMBUSTION OF TiO_2/ZrO_2–Ca THERMITE MIXTURES IN NITROGEN
Yu.M. Maksimov, A.N. Avramchik, B.Sh. Braverman, A.M. Shulpekov (Russia)

80. OBTAINING OF COMPOSITE MATERIALS BY SHOCK-WAVE TREATMENT AND SHS
A.Yu. Malakhov, I.V. Saikov, V.G. Salamatov, S.A. Seropyan (Russia)

81. SHS OF $Al_xCoCrFeNi$ HIGH-ENTROPY ALLOYS
F. Kaya, B. Derin (Turkey)

82. GAS ENVIRONMENT INFLUENCED TRIBOLOGICAL BEHAVIOR OF TMD COATINGS
A.V. Bondarev, T. Polcar (Czech Republic, Russia,)

83. MULTILAYER TiNbC COATINGS PRODUCED BY A COMBINATION OF PULSED ARC EVAPORATION AND ELECTRO-SPARK DEPOSITION IN VACUUM
O.S. Manakova, K.A. Kuptsov, A.N. Sheveyko, D.V. Shtansky, D.A. Sidorenko (Russia)

84. OBTAINING CARBON-CONTAINING COMPOSITES BASED ON ILMENITE AND CHROME CONCENTRATE BY SHS
S. Tolendiuly, S. M. Fomenko, A. Akishev, N. Rakhym, and D. Kashkynbai