

Western-Caucasus Research Center | WCRC  
Knowledge for Tomorrow



Dr. Alexander Lukin  
Principal Research Scientist & Executive Director  
Western-Caucasus Research Center, Russian Federation

Date and Place of Birth: December 05, 1962 (Moscow, Russia)  
Nationality: Russian

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## SUMMARY

Dr Alexander Lukin is a Principal Research Scientist & Executive Director at the Western-Caucasus Research Center (Tuapse, Russia), Expert of the Russian Academy of Sciences (Moscow, Russia), Expert of the Expertise Councils of the Russian Science Foundation (Moscow, Russia), Expert of Federal Register of Experts of the Ministry of Education and Science of the Russian Federation in the area of Space and Transport Systems (Moscow, Russia), Honorary Fellow and Chair of the Research Sub-committee of the Academic Council of the Australian Institute of High Energetic Materials (Sippy Downs, Australia).

Dr. Lukin is Associate Fellow and Lifetime Member of the American Institute of Aeronautics and Astronautics (AIAA), International Member of the AIAA Solid Rockets Technical Committee (SRTC); Member of the AIAA United Nations Committee On Peaceful Uses of Outer Space (UN-COPUOS) Working Group (WG); Member of the International Advisory Committee of the State Key Laboratory for Modification of Chemical Fibers and Polymer Materials (SKLFPM) in Donghua University, Shanghai, China; Professor-Advisor of the Shaanxi Research Institute of Applied Physics-Chemistry, China; Academic Consultant of the North-Western Polytechnic University, China; Lifetime Member of the High Energy Materials Society of India; Member of Russian Section of the International Combustion Institute;

Dr Lukin is a Member of the Editorial Board of the Defence Science Journal (DRDO, India), Editorial Advisory Board Member of the Defence Technology Journal, Member of the Editorial Board of the International Journal of Aeronautical Science & Aerospace Research, Member of the International Scientific Committee and Editorial Review Board on Aerospace and Mechanical Engineering of the World Academy of Science, Engineering and Technology.

Dr Lukin is a Professor-Advisor of the Shaanxi Research Institute of Applied Physics-Chemistry, China; Academic Consultant of the North-Western Polytechnic University, China; Member of International Advisory Committee of the State Key Laboratory for Modification of Chemical Fibers and Polymer Materials (SKLFPM) in Donghua University, Shanghai, China; Lifetime Member of the High Energy Materials Society of India; Member of Russian Section of the International Combustion Institute.

Dr. Lukin is a member of the National Graphene Association (NGA) and member of the Inter-regional Society of Scientists of Russia (ONR Russia).

Dr. Lukin's areas of research interest are in theoretical modeling and numerical simulation of combustion processes of the energetic materials; advanced propulsion materials; solid propulsion systems; ignition and combustion of propellants for space and rocket propulsion; unstable and abnormal combustion of the energetic materials; microscale combustion mechanisms; combustion instability; smart solid micro-propulsion systems; solid divert and attitude control systems; throttle control of solid propulsion systems; nanotechnologies; functional nanomaterials; carbon-based nano-materials; self-organizing of the micro/nano-scale structures; micro-cyamics.

Dr. Lukin got a M.S. degree (Rocket Propulsion Engineer) from Izhevsk State Technical University with the Diploma of Excellence (1985) and Ph.D. degree (Phys. & Math.) from the Physics-Technical Institute of the Ural Branch of the Russian Academy of Sciences (1993, Izhevsk, Russian Federation). His Ph.D. thesis was on the subject of mathematical modeling of the intra-ballistic processes in the solid propellant rocket motor pyrotechnic ignition systems.



Dr. Lukin was involved in critically-important research programs associated with the development of the solid propulsion systems that support the upper stages of intercontinental ballistic rockets. He was also engaged in: 1) the development of the pyrotechnic igniter for the solid propulsion system of the submarine launched intercontinental ballistic rocket and 2) the development of the information gathering system of the space combat laser station. Dr Lukin introduced the use of certain new concepts in designing warheads with the user- scheduled defeat areas for applications in the upper atmosphere and in space. He also developed a series of new technologies for fast ignition of solid propulsion systems that have proven to be very effective. Many of Dr. Lukin's new designs of pyrotechnic ignition systems are documented in book chapters, journal papers, and conference proceedings.

For the past 30 years, Dr. Lukin has been engaged in investigating the challenging problem of combustion instability in solid propellant propulsion systems.

Dr. Lukin has made a notable contribution to the advancement of next-generation controllable solid propulsion systems through the development of innovative concepts and strategies that lead to more precise thrust control and extreme thrust control enhancement.

Dr. Lukin has developed an innovative universal concept of spatial-periodic micro-structures excitation on energetic material burning surfaces. This concept opens up new possibilities for control by physical/chemical processes that evolve in the burning wave of energetic materials. He was the first to propose the use of self-propagated high-temperature synthesis for advancing solid propulsion technologies.

More specifically, Dr. Lukin introduced new methods that lead to an optimal organization of the intra- chamber processes that affect solid propulsion system ignition-transients for the purpose of reducing vibrational loads, pressure oscillations, and their impact on rocket assemblies and their system components.

Dr. Lukin conceived and developed an innovative universal concept to prescribe the micro/nano- scale structures and wave patterns that evolve in the reactionary zones of energetic materials. In addition to this pioneering work, he developed a new theory to describe the negative erosion mechanism at the burning surface of solid propellant rockets, which was later confirmed by extensive experimental data.

In fact, Dr. Lukin was the first to propose the universal concept of self-synchronization of micro and nano-scale structures in the reactionary zones of energetic materials and, based on this concept, to identify new micro-scale combustion mechanisms in solid rocket propellants.

Dr. Lukin introduced a novel strategy to more effectively modulate the thrust control capability in next- generation small-scale solid propulsion systems. This was accomplished by smart manipulation, namely, by allowing for self-synchronization of the micro- and nano-scale oscillatory networks and the self-organized wave patterns that form in the rocket chamber's reactionary zones. Dr. Lukin advanced the use of an innovative system of acoustic waves and electro-magnetic fields, generated by ring-shaped electric discharges and resonant laser radiation waves, to promote the necessary self-organization. Moreover, Dr. Lukin was able to demonstrate that the operation of this innovative ring-shaped electric discharge generator is very efficient as it requires minimal energy expenditure. As such, it opens up the prospects for almost inertia-free control of combustion processes.

Dr. Lukin has made significant contributions to the development of new multifactorial computational models for energetic material combustion and detonation using Data Science Methods. His models and computational codes have been developed and applied to specific propulsion-related problems and then validated in laboratory-scale experiments. These have led to a new framework for modeling combustion instability in solid propulsion systems.

Dr. Lukin has produced more than 170 technical publications documenting his research findings in combustion instability, propellant ignition, propellant internal ballistics, and advanced plasma technology for energetic materials. Dr. Lukin has a number of awards for the Best Researches, lecture courses and organizing roles in International Scientific Meetings.



## EDUCATION

College/University	Degree(s) and Major	Year
Physics-Technical Institute Ural Branch of the Russian Academy of Sciences	Ph.D. Mechanics of the Fluids, Gas and Plasma (Phys. & Math.). Theme of the Ph.D. Thesis: "Mathematical Modeling of the Intra-Ballistic Processes in the Solid Propellant Rocket Motor Pyrotechnic Ignition System"	1992
Post-graduate course under guidance of Academician of the Russian Academy of Sciences, Professor Alexey M. Lipanov, Izhevsk State Technical University, (1986-1992)	Speciality "Mechanics of the Fluids, Gas and Plasma"	1992
Izhevsk State Technical University (Unit of Mechanics, leaded by Academician of the Russian Academy of Sciences, Professor Alexey M. Lipanov), (1979-1985)	M.S. Mechanical Engineering with Diploma of Excellence Designing and Technology of the Advanced Rocket Systems (Rocket Propulsion Engineer)	1985

## PROFESSIONAL EXPERIENCE

Dates of Employment	Organization	Job Title	Short Job Description/ Significant Accomplishment
2009-7 - Present	Western-Caucasus Research Center	Principal Research Scientist & Executive Director	Company general management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches, organizing and coordinating of the international conferences and seminars.
2021-10 - Present	Russian Science Foundation	Expert of the Expertise Councils of the Russian Science Foundation	Expertise and Evaluation of the Research Projects applications and the Research Projects reports.
2016-7 - Present	Russian Academy of Sciences	Expert in the area of Combustion, Propellants and Aerospace Propulsion	Preparation of the research proposals, execution of the researches, evaluation of research projects execution.
2012-4 - Present	Scientific Research Institute - Federal Research Centre for Projects Evaluation and Consulting Services, The Federal Register of Experts of the Ministry of Education and Science of the Russian Federation	Expert in the area of Space and Transport Systems	Preparation of the research proposals, execution of the researches, evaluation of research projects execution
2017-10 - Present	Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Chair of the Research Subcommittee of the Academic Council	Researches management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches, organizing and coordinating of the international conferences and seminars.
2006-9 - Present	North-Western Polytechnic University, Xian, Shaanxi Province, China	Academic Consultant	Consulting & Lecture Courses on Aerospace Engineering & Advanced Propulsion Materials



2003-6 - Present	Shaanxi Applied Physics and Chemistry Research Institute, Xian, Shaanxi Province, China	Professor-Advisor	Consulting & Lecture Courses on Energetic Materials Combustion
2001-1 - Present	International Combustion Institute Russian Section, Ural-Volga Regional Branch	Scientific Secretary	Coordination of combustion researches in the Ural-Volga Regional Branch of the International Combustion Institute Russian Section
2007-8 to 2016-4	Russian State Hydro-Meteorological University of Saint-Petersburg, Southern Branch	Vice-Director for Science	Research projects management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches. Space Weather and GeoMagnetic Field Research within Project "Globus".
2015-5 to 2015-12	Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Honorary Chancellor	Researches management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches
2010-5 to 2015-4	Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Vice-Chancellor (Research)	Researches management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches
2014-5 to 2015-7	High Power Laser and Microwave Systems Pty. Ltd., Queensland, Gladstone, Australia	Member of the Board of Directors	Researches management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches
2012-4 to 2015-7	21 Century Products Limited, Queensland, Sippy Downs, Australia	Member of the Board of Directors	Researches management, organizing and coordinating of international research projects, execution and supervision of the researches, providing of the lecture courses on advanced researches
1999-1 to 2007-7	Scientific Council on Combustion and Explosion of the Presidium of the Russian Academy of Sciences, Ural-Volga Branch	Scientific Secretary	Coordination of combustion researches in the Ural-Volga Branch of the Scientific Council on Combustion and Explosion of the Presidium of the Russian Academy of Sciences
1994-1 to 2007-7	Institute of Applied Mechanics Ural Branch of the Russian Academy of Sciences	Vice-Director for International Relations	Organizing and supervising of research interaction and research projects with foreign research institutions
1993-1 to 2007-7	Institute of Applied Mechanics Ural Branch of the Russian Academy of Sciences	Senior Scientist	Research of ignition and combustion of solid propellants for space and rocket propulsion
1989-9 to 1992-12	Izhevsk State Technical University, Chair of the Rocket	Research Scientist	Mathematical Modeling of the Intra-Ballistic Processes in the



	Engines Manufacturing and Designing		Solid Propellant Rocket Motor Pyrotechnic Ignition System
1986-9 to 1989-8	Izhevsk State Technical University, Chair of the Rocket Engines Manufacturing and Designing	Junior Research Scientist	Mathematical Modeling of the Intra-Ballistic Processes in the Solid Propellant Rocket Motor Pyrotechnic Ignition System
1986-9 to 1989-8	Izhevsk State Technical University, Chair of the Rocket Engines Manufacturing and Designing	Post-graduate student	Mathematical Modeling of the Intra-Ballistic Processes in the Solid Propellant Rocket Motor Pyrotechnic Ignition System
1986-3 to 1986-8	Izhevsk State Technical University, Scientific-Research Department of the Facilities and Methods of Measurements	Engineer	Development of information-measuring systems for a space station
1983-1 to 1986-2	Izhevsk State Technical University, Branch Specialized Scientific-Research Laboratory	Engineer	Research and Development of the Solid Propulsion Systems

### ORGANIZING ROLES IN SCIENTIFIC MEETINGS

Organizer, Scientific Secretary and Member of the Organizing Committees of the International Conferences on Combustion (ICOC): 1993 (Moscow-Saint Petersburg), 1996 (Saint Petersburg), 1999 (Izhevsk), 2002 (Moscow); NATO Advanced Research Workshop (NATO-ARW) on "Peaceful Utilization of the Energetic Materials", Saint Petersburg, 1996; International scientific Workshops on Intra-Chamber Processes, Combustion and Gas-Dynamics of Dispersed Systems, (1995, 1997, 2000, 2004), Saint Petersburg and International Workshop "Non-Stationary Combustion and Internal Ballistics", Baltic State Technical University, Saint Petersburg, 2000; Organizer and Scientific Secretary of the Organizing Committee of the 8th Asia-Pacific International Symposium on Combustion and Energy Utilization (8-APISCEU), Sochi, Russian Federation, 2006, Website: <http://APISCEU.narod.ru>; Member of the International Advisory Committee of the International Symposium on Special Topics in Chemical Propulsion (6-ISICP, 2005, 7-ISICP, 2007, 8-ISICP, 2009), Co-Chair of the technical sessions at the 7-ISICP (2007), 2009 International Autumn Seminar on Propellants, Explosives and Pyrotechnics, Kunming, Yunnan Province, China, September 22-25, 2009 (IASPEP-2009), 2013 International Autumn Seminar on Propellants, Explosives and Pyrotechnics, Chengdu, Sichuan Province, China, September 24-27, 2013 (IASPEP-2013), Member of the Propulsion Physics Technical Committee of the European Conference for Aero-Space Sciences (EuCASS Conference); Member of the Monitoring and Advisory Committee of the 2009 Multilingual Interdisciplinary Conference on Chemical, Mechanical and Materials Engineering (2009 ICCMME), Melbourne, Australia, 07-20 December, 2009; Conference Chair & Chair of the Scientific Monitoring and Advisory Committee of the 2010 International Conference on High Energetic Materials and Dynamics of Ultrafast Reactive Systems, 06-19.12.2010; The ISICP Executive Committee Member (International Symposium on Special Topics in Chemical Propulsion); Deputy Chairperson (Special Engineering Topics) of the Perpetual Engineering V-Conference (PEV-C), 06.12.2010; Member of the International Scientific Committee of the 7th International Seminar on Flame Structure (7ISFS, July 11-15, 2011), and First Young Researchers' School on Flame Study (July 11-19, 2011), Novosibirsk, Russian Federation; Member of the International Scientific Committee of the 9th International Seminar on Flame Structure (9ISFS, July 10-14, 2017), Novosibirsk, Russian Federation; Moderator of the Oral Session: "Data Driven Knowledge-Based Systems for Basic and Applied Sciences: Combustion, Detonation, Nanotechnology, Renewable Energetics (ID 9) at the International CODATA 2017 Conference 'Global Challenges And Data-Driven Science', 8-13 October 2017, Saint Petersburg, Russia; Chairperson of the Technical Session, Energetic Materials at the First International Conference on Defence Technology (1st ICDT), Beijing, October 21-25, 2018, China.



**HONORS AND AWARDS**

Date	Technical Society/Organization	Award Name	Short Description
1984	Izhevsk State Technical University (ISTU), Izhevsk, Udmurtia Republic, Russia	Best Undergraduate Thesis Paper Award	Awarded for distinguished achievements.
1985	Izhevsk State Technical University (ISTU), Izhevsk, Udmurtia Republic, Russia	Best MSc Thesis Paper Award	Awarded for distinguished achievements.
1985	Izhevsk State Technical University (ISTU), Izhevsk, Udmurtia Republic, Russia	Rocket Propulsion Engineer Diploma of Excellence	Awarded for distinguished achievements.
1993	Institute of Applied Mechanics, Ural Branch of the Russian Academy of Sciences, Izhevsk, Udmurtia Republic, Russia	Award for Organization of the International Conference on Combustion and Intra-Chamber Processes, September 1993	Awarded for distinguished service.
1996	Institute of Applied Mechanics, Ural Branch of the Russian Academy of Sciences, Izhevsk, Udmurtia Republic, Russia	Award for Excellence in Fundamental Researches, April 1996	Awarded for distinguished achievements.
1997	Second International Seminar "Intra-Chamber Processes, Combustion and Gas Dynamics of Dispersed Systems", Saint Petersburg, Russia	Best Paper Award	Awarded for distinguished achievements.
1999	Institute of Applied Mechanics, Ural Branch of the Russian Academy of Sciences, Izhevsk, Udmurtia Republic, Russia	Award for Excellence in Fundamental Researches	Awarded for distinguished achievements.
1999	Ural Branch of the Russian Academy of Sciences, Russia	Award for Excellence in Fundamental Researches	Awarded for distinguished achievements.
1999	Institute of Applied Mechanics, Ural Branch of the Russian Academy of Sciences, Izhevsk, Udmurtia Republic, Russia	Award for Organization of the International Conference on Combustion and Intra-Chamber Processes, October 1999	Awarded for distinguished service.
2001	High Energy Materials Research Laboratory (HEMRL) of the Defence Research and Development Organisation (DRDO), Pune, India	Award of Director for Excellence in Fundamental Researches	Awarded for distinguished achievements.
2001	High Energy Materials Society of India	Lifetime Member of the High Energy Materials Society of India	Awarded for distinguished achievements.
2002	Institute of Applied Mechanics, Ural Branch of the Russian Academy of Sciences, Izhevsk, Udmurtia Republic, Russia	Award Excellence in Fundamental Researches, October 2002	Awarded for distinguished achievements.
2003	Shaanxi Research Institute of Applied Physics-Chemistry, Xian, Shaanxi Province, China	Award of Director for Excellence in Fundamental Researches	Awarded for distinguished achievements.
2006	The 8th Asia-Pacific International Symposium on Combustion and Energy Utilization (8th APISCEU), October 10-12, 2006, Sochi, Russian Federation.	Best Paper Award	Awarded for distinguished achievements.
2009	Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Certificate of Appreciation for valuable help in organizing the 2009 Interdisciplinary Conference on Chemical, Mechanical and Materials	Awarded for distinguished service



		Engineering, 7-20 Dec., 2009, Melbourne, Australia" as a member of the international scientific committee (2009)	
2010	Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Honorary Fellow of the Australian Institute of High Energetic Materials, Queensland, Sippy Downs, Australia	Awarded for distinguished service and achievements.
2011	Western-Caucasus Research Center	Award for Excellence in Fundamental Researches, April 2011	Awarded for distinguished service and achievements.
2012	Western-Caucasus Research Center	Award for Excellence in Fundamental Researches, April 2012	Awarded for distinguished service and achievements.
2014	AIAA Propellants and Combustion Technical Committee	The Certificate of distinguished service to the AIAA as a member of the Propellants and Combustion Technical Committee, 2009-2014.	Awarded for distinguished service
2014	Commonwealth of Australia, Department of Industry	Skills and Knowledge grant (Project Reference Number CAU06314) for obtaining expert advice and services to assist in the commercialization process of a novel laser flow visualization technique for imaging of flow around stationary and moving objects in aerospace, engineering & medical applications.	Awarded for distinguished achievements.
2016	Western-Caucasus Research Center	Award for Excellence in Fundamental Researches, April 2016	Awarded for distinguished service and achievements.
2017	Western-Caucasus Research Center	Award for Excellence in Fundamental Researches, May 2017	Awarded for distinguished service and achievements.
2018	The National Aerospace Propulsion Conference (NAPC),	Plenary Lecture, December 17-19, 2018, Indian Institute of Technology Kharagpur.	Awarded for distinguished achievements.
2019	Western-Caucasus Research Center	Award for Excellence in Fundamental Researches, May 2019	Awarded for distinguished service and achievements.

**EXTRACURRICULAR ACTIVITIES**

High-Mountain Backpacking, Mountain Expeditions, Bicycle Tourism, Scuba diving

**LANGUAGES**

Russian (native), English





This certificate is awarded to

*Alexander N. Lukin*

for distinguished service

to the

AMERICAN INSTITUTE OF  
AERONAUTICS AND ASTRONAUTICS

as a member of the

*Propellants and Combustion*

Technical Committee

2009-2014



*J. Albert*  
\_\_\_\_\_  
President

*David R. Riley*  
\_\_\_\_\_  
Vice President—Technical





### Examples of Recent and Significant Publications:

1. Shestakov, V.A., Voevodin, V.Yu., **Lukin, A.N.** and Sorokin, V.N., **The Propulsion System**, The USSR Author Certificate № 228843, F 02 K 9/04, Registered at 01.11.1985, (in Russian).
2. Lipanov, A.M., **Lukin, A.N.**, Aliev, A.V., **The Warhead with the Scheduled Defeat Area**, The USSR Author Certificate № 244701, F 42B 13/08, Registered at 03.11.1986, (in Russian).
3. Lipanov, A.M., **Lukin, A.N.**, Aliev, A.V., **The Igniter for the Solid Propellant Rocket Motor**, The USSR Author Certificate № 255977, F 02 K 9/95, Registered at 01.06.87, (in Russian).
4. Lipanov, A.M., **Lukin, A.N.**, Aliev, A.V., **The Warhead with the Scheduled Defeat Area**, The USSR Author Certificate № 264941, F 42B 13/08, Registered at 02.11.87, (in Russian).
5. Lipanov, A.M., **Lukin, A.N.**, Aliev, A.V., **The Igniter for the Solid Propellant Rocket Motor**, The USSR Author Certificate № 278689, F 02 K 9/95, Registered at 01.07.88, (in Russian).
6. Lipanov, A.M., **Lukin, A.N.**, Aliev, A.V., **The Igniter for the Solid Propellant Charge of the Rocket Motor**, The USSR Author Certificate № 288948, F 02 K 9/95, Registered at 01.02.89, (in Russian).
7. Lipanov, A.M., **Lukin, A.N.**, **The Combined Artillery Propellant Charge**, Pat. № 2074375 of Russia, F 42 B 5/16, Application № 94010941/08, Priority from March 29, 1994, Registered at February 27, 1997, (in Russian).
8. Pivkin, N.M., Pelykh, N.M., Lipanov, A.M., **Lukin, A.N.**, Alikin, V.N., Pivkin, A.N., Kuzmitskii, G.E., **Technology of Influence on the Atmospheric Phenomena**, Pat. № 2169228, E 01 H 13/00, A 01 G 15/00, Application № 99107267/13, Priority from April 12, 1999, Registered at June 20, 2001, The Inventions Bulletin (Russia) No. 17, June 20, 2001, (in Russian).
9. **Lukin, A.N.**, **The Pyrotechnic Ignition System**, Pat. № 2178093, F 02 K 9/95, Application № 2000105437/06, Priority from March 03, 2000, Registered at January 10, 2002, The Inventions Bulletin (Russia) No. 32, November 20, 2003, (in Russian).
10. Lipanov, A.M., **Lukin, A.N.** and Aliev A.V., **Unsteady-State Combustion of a Granulated Solid Propellant in a Cylindrical Channel**, Combustion, Explosion, and Shock Waves, Springer, New York, Vol. 30, No. 6 / November, 1994, pp. 764-771.
11. Lipanov, A.M., **Lukin, A.N.** and Skaiyanskaya, T.A., **The Intrachamber Processes in the Start Interval of the Solid Propellant Rocket From a Thermally Insulated Container**, Proceedings of the Third Asia-Pacific International Symposium on Combustion and Energy Utilization, (Hong Kong, 11-15 December, 1995). - Vol. 2. Combustion Fundamentals. - The Hong Kong Polytechnic University, Kowloon, Hong Kong, 1995. - pp. 614-619.
12. Lipanov, A.M., **Lukin, A.N.** and Aliev A.V., **Numerical Investigation of Pelletized Solid Propellant Nonstationary Combustion in a Gas Generation System**, Theory of Combustion of Powder and Explosives. Editor Alexey M. Lipanov, U.S.A., New York: Nova Science Publishers, Inc., 1996. - pp. 15 – 26.
13. Lipanov, A.M., **Lukin, A.N.** and Aliev A.V., **Numerical Simulation of the Non-stationary Spatial Gas-dynamics Processes Accompanying the Pelletized Solid Propellant Combustion in a Gas Generator**, "Challenges in Propellants and Combustion: 100 Years After Nobel", Edited by Kenneth K. Kuo, Begell House, Inc., New York, Wallingford (U.K.), 1997, pp. 1164-1178.



14. Lipanov, A.M., **Lukin, A.N.** and Aliev A.V., **Numerical Simulation of the Non-stationary Spatial Gas-dynamics Processes Accompanying the Pelletized Solid Propellant Combustion in a Gas Generator**, International Journal of Energetic Materials and Chemical Propulsion, Vol. 4, Issue 1-6, 1997, pp. 1164-1178.
15. Lipanov A.M., **Lukin, A.N.**, **Mathematical Modeling of Non-stationary Physics-Chemical Processes in Large-Sized SPRM Pyrotechnical Ignition System**, Defense Science Journal, Defense Scientific Information & Documentation Centre, Defense Research & Development Organisation, Ministry of Defence, New Delhi, India, Vol. 47, No. 4, 1997, Special Issue on Armament Technology, pp. 505-516.
16. Lipanov A.M., **Lukin, A.N.**, **Numerical Investigation of the Nonstationary Physico-Chemical Processes, which Forming the Nonestimated Actions in the Pyrotechnic Gas Generating System**, Proceedings of the Twenty-Fourth International Pyrotechnics Seminar (27-31 July 1998), Monterey, California, U.S.A. - 1998. - pp. 757-770.
17. Lipanov A.M., **Lukin, A.N.**, **The Ordnance Systems Ballistic Effectiveness Increase by the Means of Programming of Combustion Progressivity of the Multielement Solid Propellant Charge**, Proceedings of the Twenty-Fourth International Pyro-technics Seminar (27-31 July 1998), Monterey, California, U.S.A. - 1998. - pp. 771-781.
18. **Lukin, A.N.**, Lipanov A.M., **Mathematical Modeling of the Solid Propellant Rocket Ignition System Charge Ignition Delay**, Propellants, Explosives, Rockets, and Guns (Proceedings of the Second International High Energy Materials Conference and Exhibit, December 8-10, 1998, IIT Madras, Chennai, India), Ed. S.Krishnan, S.K. Athithan. - Allied Publishers Limited. - 1998. - pp. 513-520.
19. Lipanov A.M., **Lukin, A.N.**, **Ordnance Systems Ballistic Effectiveness Increase by the Charge Combustion Progressivity Programming**, Propellants, Explosives, Rockets, and Guns (Proceedings of the Second International High Energy Materials Conference and Exhibit, December 8-10, 1998, IIT Madras, Chennai, India), Ed. S.Krishnan, S.K. Athithan. - Allied Publishers Limited. - 1998. - pp. 59-63.
20. **Lukin, A.N.**, Lipanov A.M., **The Advanced Technology of the Large-Sized Large-Lengthened SPRM Charges Ignition**, Proceedings of the Twenty-Seventh International Pyrotechnics Seminar (July 16-21, 2000: Adam's Mark Hotel, Grand Junction, Colorado, U.S.A.). - IIT Research Institute, Chicago, Illinois, U.S.A., 2000. - pp. 181-188.
21. **Lukin, A.N.**, Lipanov A.M., **Numerical Modeling of the Physics-Chemical Process Development in the Advanced Technology of the Large Lengthened SPRM Charges Ignition**, Proceedings of the 3<sup>rd</sup> International High Energy Materials Conference and Exhibit HEMCE-2000, Thiruvananthapuram, INDIA, (December 6-8, 2000), High Energy Materials Society of India, Thiruvananthapuram Chapter, SB Press (P) Ltd., Thiruvananthapuram. 2000, pp. 324-328.
22. Lipanov A.M., **Lukin, A.N.**, **Abnormal Physics-Chemical Processes in the Technical Systems, Based on Combustion of the Solid Propellants and Gun-powders**, The Concept of Development of Combustion and Explosion as a Field of Scientific-Technical Progress, Ed. by Acad. A.G.Merzhanov, Publ. House "Territoriya", Chernogolovka, p. 124, 2001, (in Russian)
23. **Lukin, A.N.**, **Numerical Modeling and Method of Prevention of the Anomalous Combustion Regimes Development in the High-Loading-Density Solid Propellant Rocket Motor**, Proceedings of the 28<sup>th</sup> International Pyrotechnics Seminar, Adelaide, South Australia, November 4-9, 2001, Weapons Systems Division, DSTO, 2001, pp. 513-528.
24. **Lukin, A.N.**, **New Technology for Prevention of the Anomalous Combustion Regimes Development in the High-Loading-Density SPRM**, Theory and Practice of Energetic Materials (Vol. IV), Ed. by Chen Lang and Feng Changgen, Beijing, China Science and Technology Press, 2001. - pp. 157-174.



25. **Lukin, A.N., Numerical Modeling and Method of Prevention of the Anomalous Com-bustion Regimes Development in the High-Loading-Density Solid Propellant Rocket Motor**, Proceedings of the 28<sup>th</sup> International Pyrotechnics Seminar, Adelaide, South Australia, November 4-9, 2001, Weapons Systems Division, DSTO, 2001. – pp. 513-528.
26. **Lukin, A.N., Numerical Modeling and Method of Prevention of the Anomalous Combustion Regimes Development in the High-Loading-Density Solid Propulsion System**, Proceedings of the 6<sup>th</sup> Asia-Pacific International Symposium on Combustion and Energy Utilization, May 20-22, 2002, Kuala Lumpur, Malaysia, Published by Faculty of Mechanical Engineering, Universiti Teknologi Malaysia, 81310 UTM, Skudai, Joho D. T., Malaysia, 2002. - pp. 392-397.
27. **Lukin, A.N., The Center-Pulsating Burning Mode and Rayleigh-Taylor Instability Phenomenon at the Energetic Materials Burning**, Proceedings of the 6<sup>th</sup> Asia-Pacific International Symposium on Combustion and Energy Utilization, May 20-22, 2002, Kuala Lumpur, Malaysia, Published by Faculty of Mechanical Engineering, Universiti Teknologi Malaysia, 81310 UTM, Skudai, Joho D. T., Malaysia, 2002. - pp. 404-409.
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