

**Prof. Alexander L. Gusev (CV - short – 2018)**  
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- *Military Engineering Red Banner Institute named after A.F. Mozhaisky, engineer-mechanic “Flying Machine”*  
- *Postgraduate studies with honors, NPO “Cryogenmash”, Balashikha, Moscow region (Academic Advisor Kupriyanov V.I.), engineer-researcher (chemist-technologist in hydrogen technologies) 1989-1994, thesis “Large-scale active cryo vacuum systems of hydrogen refueling complex of rocket carriers of the heavyweight class” [https://www.researchgate.net/publication/312094377\\_AL\\_Gusev\\_CV\\_January\\_2017](https://www.researchgate.net/publication/312094377_AL_Gusev_CV_January_2017)*

Participation in more than 50 governmental programs, over 12 R&D projects (as an author and project manager), more than 50 patents for inventions on hydrogen technology - [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=patent](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=patent), more than 20 innovation proposals implemented on space launch complexes, more than 500 scientific works, received 12 Russian and international scientific awards. A.L. Gusev gave lectures in Japan on official invitations (companies: Asahi Kasei Corporation, Nissan, Nissan Motors, Mitsubishi, Toyota, Toyota Tsusho, etc.), Germany (Bayer, etc.), Switzerland (ETS), Poland (Polytechnic Institute in Lodz), USA (University of Orlando, University of Miami), Armenia (Yerevan State University), Russia (Moscow State University, etc.), Uzbekistan (at the invitation of the President of the Republic of Uzbekistan), and in other countries [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=inProceedings](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=inProceedings)

In 2004, at the invitation of the Emperor of Japan and the Ministry of Culture and Science of Japan made a Plenary Report on nanomembrane gas purification technology at Asahi Kasei Corporation and made five reports on hydrogen energy and hydrogen transport at leading automobile corporations of Japan (Toyota, Toyota Tsusho, Honda, Mitsubishi Motors, Nissan, etc.), in 2000 visited USA and made scientific reports there (Miami, Orlando, New York), in 2002, visited Switzerland, Zurich, ETS and made scientific reports there, in 1995-2018 visited more than 30 scientific organizations in a number of countries of the world and CIS countries and made scientific reports there.

**Skills.** Hydrogen Storage, Nano-Catalysis, Hydrogen Production, Gas Adsorption, Hydrogen Generation, Green Chemistry Technology, Material Characterization, Materials, Nanomaterials, Synthesis, Nanomaterials Synthesis, Adsorption, Microstructure, Porous Materials, Mesoporous Materials, Catalyst Characterization, Materials Testing, Advanced Materials, Mechanical Properties, Kinetics, Chemical Application, Reaction Kinetics, Solar Energy, Carbon Nanomaterials, Experimental Physics, Radiation Detection, Hydrogen Energy, Surface Properties, Heterogeneous Catalysis, Catalyst Synthesis, Cryogenics, Energy, Cryogenics Engineering, Fluid Dynamics, Mechanics, Vehicle Dynamics, Electrochemistry, Thermodynamics, Nuclear Engineering, Nanotechnology, Photoconductivity, Chemical Engineering, Electrochromic Devices, Graphene Sheets, Mathematical Physics, Polymer Chemistry, Composites, Thin Films, Lithium Ion Batteries, Solid Oxide Fuel Cells, Geochemistry, Physical Chemistry, Spectroscopy, Materials Science, Condensed Matter Physics, Ecology, Patents, Gas, Invention, steam reforming of ethanol, Gases, Detectors, Oxygen, Nano, Electrochromics, Hydrogen sensors, Hydrogen, Heat, Space Technology, Space Technology for Development, Cryology, Temperature, Cryosorption, Hydrogen recombiners, Space Vehicles, Photochromic materials, Leak test, Alternative energy and ecology, Thermoelectric systems, Binary Ice, superinsulation, Nuclear, CRYOGENIC TANKS, cathode materials, MATERIALS FOR SUPERCAPACITORS, ENERGY OBJECTS, MWCNT, electrochromic film, PHOTOCHROMIC TRIPLEX, CRYOGENIC PIPELINE, CRYOGENIC RESERVOIR, ELECTROCHROMIC SYSTEMS, hydrogen on-board storage, hydrogen accumulator, manganese dioxide palladium, Multi-Layer Insulation, Liquid hydrogen tank car, Zeolites, Fuel Cells, PEM Fuel Cells, Physisorption of molecular hydrogen, Cryopump, Regeneration of a cryopump, Vacuums and Vacuum Technology, Nano - composites Membranes for clearing Chlorine, flexible transparent electrochromic film, PHOTOCHROMIC POLYMERIC TRIPLEX, Exergy Analysis, Exergy, High Vacuum, Solar Cells, Solar Collectors, Solar Cooling, Solar Energy Conversion, Concentrated Solar Power, Hydrogen Cars, Hydrogen safety, Connectivity, Nanocomposites, Graphene Nanocomposites, Polymer Nanocomposites, composite membranes, Palladium Nanoclusters, Hydrogen gas sensors.

**Field of work.** Space engineering, space technologies, hydrogen energy, autonomous and onboard energy sources, nuclear industry, cryo vacuum technology, electrochromic and photochromic systems for climate control.

Was an ISTC expert, present expert of the FTSTP, RUSNANO. Is a reviewer of a number of editorial boards of international scientific journals - <https://publons.com/author/1403920/alexander-l-gusev#profile>

**Historical dates.** Exactly 40 years ago in 1978, I passed my first exam on hydrogen fuels for space systems. Exactly 30 years ago, I took an active part as the head of the calculation of the system 17G85 and 17G85S (cryogenic: nitrogen, oxygen, hydrogen) at the Launch Control Center of the first reusable transport space system “Energiya-Buran”.

#### **Effects discovered.**

- 1) Effect of effusion induced hydrogen instability of the superinsulation (EIHIS))
- 2) Effect of effusion induced heat conduction instability of the super-insulation in cryogenic and vacuum facilities (EIHICIS))
- 3) Effect of multiplication of the amount of desorbed hydrogen molecules (MADHM))

A.L. Gusev’s **directions of innovation activity** are connected with the development and implementation of significant scientific and technical solutions in environmentally friendly energy use, environmental safety, energy efficiency, ergonomics which made a great economic effect, and ensured the implementation of state tasks set in complex and severe situations.

For the first time in the world’s practice, A.L. Gusev proposed a technical solution to extinguish a large technological fire in a cable channel (200 cables 8 km long) using gasifying nitrogen (7 tons of gasifying nitrogen through metal hoses from a cryogenic tanker) and in a few hours, this idea was successfully implemented. This decision was later patented and transferred to RFNC-VNIIEF.

1997-2000: work in the position of the head of the research group at the Institute of Nuclear and Radiation Physics; 2000-2004: work in the position of the head of the research and design group at the RFNC-VNIIEF Design Bureau; 2004-2010: work in the position of the head of the research group at the Institute of Physics of the Explosion of the RFNC-VNIIEF.

In 2000, A.L. Gusev developed the Concept of Alternative Energy and Ecology which was approved and supported by the Patriarch of Hydrogen Energy, Dr. T.N. Veziroglu and the First Deputy Scientific Manager of the RFNC-VNIIEF, Academician of the Russian Academy of Sciences, Yuriy Alekseevich Trutnev. In 2000-2003, this Concept was implemented as a system that includes the International Association for Alternative Energy and Ecology (President A.L. Gusev), the National Association of Hydrogen Energy (initiator of its creation is A.L. Gusev, President P.B. Shelishch, later A.Yu. Ramenskiy), International Scientific Journal “Alternative Energy and Ecology” (founder and editor-in-chief A.L. Gusev), International Scientific, Educational and Information Portal “Hydrogen” (founder and editor-in-chief A.L. Gusev).

In 2000-2010, A.L. Gusev organized and held international seminars, symposiums, conferences, congresses. Among the most outstanding scientific events organized by A.L. Gusev were IFSSEHT-2000, IFSSEHT-2003, WCAEE-2006 (<https://www.youtube.com/watch?v=A0cQYe7ud4>) and other scientific events.

In 2016, the International Scientific Journal “Alternative Energy and Ecology” (founder and editor-in-chief A.L. Gusev) received one of the highest awards of the IAHE in Saragossa, Spain.

He is a General Director of the Scientific and Technical Center “TATA” since 1999, General Director of the Institute of Hydrogen Economy since 2006.

In 2015, A.L. Gusev was included in the TOP-100 of the most cited scientists in “Energetics” by the E-Library system.

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Publons - <https://publons.com/author/1403920/alexander-l-gusev#profile>

Research Gate (Info) - [https://www.researchgate.net/profile/Alexander\\_Gusev11/info](https://www.researchgate.net/profile/Alexander_Gusev11/info)

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Mendeley - <https://www.mendeley.com/profiles/alexander-gusev1/>  
Academia.edu - <https://independent.academia.edu/AlexanderGusev7>  
Research ID - <http://www.researcherid.com/rid/F-8048-2014>  
Scopus - <https://www.scopus.com/authid/detail.uri?authorId=35589714900>  
Web of Science - <http://www.researcherid.com/rid/F-8048-2014>  
Twitter - <https://twitter.com/IGusev>  
ELibrary - [https://elibrary.ru/author\\_profile.asp?authorid=170854](https://elibrary.ru/author_profile.asp?authorid=170854)  
Facebook - <https://www.facebook.com/profile.php?id=1808431306>  
**Books** - [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=book](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=book)  
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**Article** - [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=article](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=article)  
**Conference Papers** - [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=inProceedings](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=inProceedings)  
**Patents** - [https://www.researchgate.net/profile/Alexander\\_Gusev11/publications?pubType=patent](https://www.researchgate.net/profile/Alexander_Gusev11/publications?pubType=patent)  
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#### **Main introductions.**

- 1) Development and implementation of extinguishing a large technological fire with cryogenic gasifying nitrogen for the first time in the world's practice (significant economic effect, patent);
  - 2) Development and introduction of a special device which provided the termination of an abnormal nuclear reaction and the liquidation of the nuclear disaster in Sarov city, the consequences of an abnormal situation when implementing the ISTC project (significant economic and humanitarian effect);
  - 3) Development and introduction of hydrogen recombiners in cryogenic complexes (Russia, Kazakhstan, Switzerland) (significant economic effect, patents);
  - 4) Development of a Concept and creation of a new trend "Alternative Energy and Ecology" and the journal of the same name (significant scientific, technical, political, educational, expert and economic effect) (license agreement, works, know-how, patents);
  - 5) Development of Concepts and holding 12 International Forums (significant scientific, educational, international, economic effect);
  - 6) Participation in the collective development of new scientific and technical technologies in tests for the integral and local leakage of the latest models of space vehicles (flight development tests) and onboard spacesuits and spacesuits for outer space (scientific and technical solutions in spacecraft and spacesuit logbooks with a 50-year period storage). Organization and performance of works on testing spacecraft and spacesuits of more than 50 objects (FDT);
  - 7) Development and implementation of a PHOS detector prototype of the ALICE system at the Large Hadron Collider at CERN. Development, study of a two-circuit thermostat system based on cooling ethanol and binary ice suspension based on water-ethanol mixtures;
  - 8) Development and introduction of new technologies for cryogenic and cryogenic vacuum equipment (patents, acts on implementation, publications, rational proposals);
  - 9) Developments in atomics and atomic technologies (significant economic effect, patents);
  - 10) Developments in accelerator technology;
  - 11) Developments in design, operation of X-ray equipment and the creation of start-up samples of radioisotope of international collaboration;
  - 12) Developments in creating new energy generating devices and technologies (significant economic effect, patents);
- Inspection of state projects.** Energy expert (including hydrogen energy and alternative energy), nanotechnology, climate control technologies, gas sensors, cryology, space technologies: space launch vehicles (SLV) and space vehicles (SV), SLV and SV tests, preparation and launch of space launch vehicles systems, vacuum technology, cryo vacuum technology, nuclear technology, electrolysis gas purification systems, nanomembranes for gas purification. Expert of the Government of the Russian Federation on the Targeted Scientific and Technical Program, RUSNANO, Bortnik Foundation, etc.
- Conferences.** Held more than 12 international scientific events.
- Collaboration with foreign partners.**  
Cooperation with Bayer AG, JSC, Nissan Motors, Daimler Chrysler, and others.
- Hobbies:** sports (champion of Kyrgyzstan in freestyle wrestling), swimming, swimming with aqualung, traveling, tourism, mountaineering, sea leisure. I like to spend my free time beekeeping, reading, visiting museums, theaters, movies.