



## PER ASPERA AD ASTRA!

Information letter

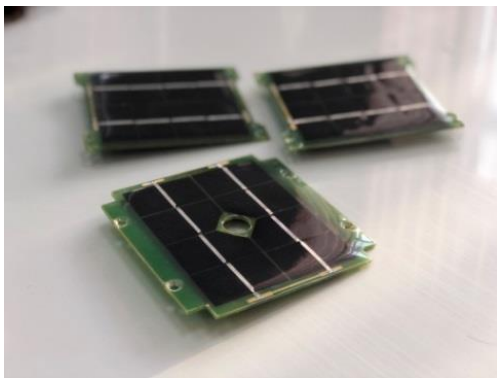
Call for Participants to International Summer School

## «Siberian Space Design School 2021» (SSDS-21s)

19-28<sup>th</sup> August 2021

**Reshetnev Siberian State University of Science and Technology** welcomes international students, PhD students, young researchers and specialists to join Online summer school “**Siberian Space Design School – 2021**” in the period **19-28<sup>th</sup> August, 2021**.

### SCHOOL OBJECTIVES



The main goal of **SSDS-21s** is studying of **the satellites development fundamentals**.

Participation in **SSDS-21s** will be mostly exciting and useful for students majoring in:

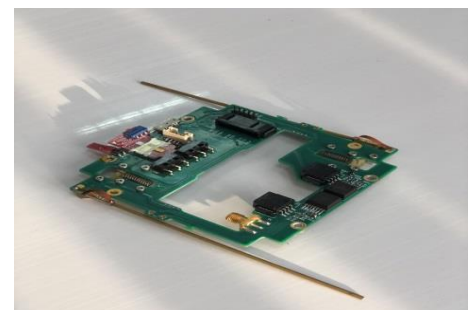
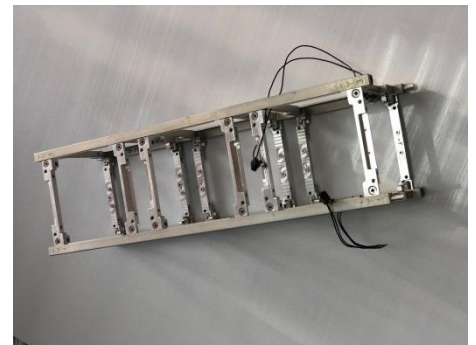
- Engineering,
- Computer Sciences,
- Modelling,
- Spacecraft and aircraft design.

### SCHOOL FORMAT

The school implies online intensive project training of design nanosatellites.

Participants will gain knowledge about nanosatellites and their subsystems on lectures and practical lessons, and then will develop a project of a space mission in groups.

Participants will get the opportunity to communicate with experts conducting theoretical and applied research in this area.

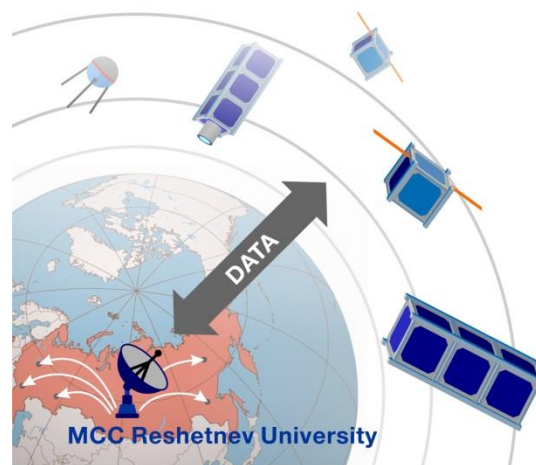


### TEACHING TEAM

**The SSDS – 21s teaching team** consists of Russian top experts and specialists from Reshetnev University and JSC “Academician M.F. Reshetnev Information Satellite Systems”, a leading Russian provider of satellites for communications, television broadcasting, data-relay, navigation and geodesy.

### SCHOOL TOPICS

CubeSat development concept  
 CubeSat mechanical design  
 CubeSat power system  
 CubeSat attitude control system  
 CubeSat communication system  
 CubeSat payload  
 Management issues of development, production and launch of CubeSat



### TECHNICAL PLATFORMS

Lectures & Practical lessons	Discord/BigBlueButton
Tests & Problems	Moodle
Project works in groups	Discord/BigBlueButton

Working language: **English**

Program participants will receive a **certificate (3 ECTS)** at completion

### TIMETABLE OF SSDS-2021s

Application opens	<b>June 01, 2021</b>
Application deadline	<b>August 10, 2021</b>
Course time	<b>August 19-28, 2021</b>

### APPLICATION & ADMISSION

All students must apply to our summer school by sending the documents to the e-mail: [sibspaceschool@gmail.com](mailto:sibspaceschool@gmail.com)

1. [A complete application form](#)
2. A brief description of the research interests (maximum 2500 characters without spaces)
3. A scanned copy of a passport

### CONTACTS

#### Organizational issues

- **Svetlana Gorbunova**, Vice-Head of International Cooperation Department, e-mail: [sibspaceschool@gmail.com](mailto:sibspaceschool@gmail.com)

## Training program

- **Vladislav Khanov**, coordinator, associate professor, department of Security of Information Technologies, e-mail: [khvkh@mail.ru](mailto:khvkh@mail.ru)
- **Dmitriy Zuev**, coordinator, Research Laboratory "Small spacecrafts", e-mail: [zuevdmity93@yandex.ru](mailto:zuevdmity93@yandex.ru)

## REVIEWS OF PARTICIPANTS OF PREVIOUS SCHOOLS

### Veryovkin Pavel, student of Reshetnev University



"Siberian satellite design school" is a dream of a true developer. I'm a student of a "Physics" bachelor program. I study a lot of theory on this program. I've seen how theory works in practice on the school. I was able to immerse myself deeply in the spacecraft topics.

It was especially interesting to learn about the history of rocketry, the construction of various spacecraft systems, as well as the organization of communication between ground stations and a satellite.

The format is quite intensive, so you need to quickly do everything and use the incoming information, and if something does not work out, then the curators and teachers are very responsive, help to do everything right. Thanks to the teachers and participants for a great time.

### Makarov Dmitriy, student of Reshetnev University

The school is a really nice place not only for who have just started their way to space, but also for those who have been in the space industry for some time. The course is very rich in knowledge about the development of cubesats and the stages of their design.

There were excellent tutors, exciting and colorful lectures, nice examples and parallels from everyday life, which helped to understand lectures' materials better. I really liked the school. It costs all time I've spent.



## PARTICIPATION COSTS OF THE PROGRAM

Participation in the Online International School "SSDS-2021s" is **free** for all participants

Siberian Space Design School detailed schedule is available in **Appendix A**

### Appendix A

Siberian Space Design School (SSDS-21s)  
Introduction to the design of Cubesat satellites  
19.08.2021 – 28.08.2021

### August, 19<sup>th</sup>, Wednesday

Lecture 1	Review of the school. Introduction to spaceflights.
Lecture 2	Small satellites. CubeSat satellites.
Lunch break	
Lecture 3	CubeSat payloads

Project *	Space mission objective. Planning of project work.
-----------	--

### August, 20<sup>th</sup>, Thursday

Lecture 1	Orbital mechanics and satellites orbits
Lecture 2	Review of CubeSat on-board systems
	Lunch break
Lecture 3	Space and launch environment.
Project *	Orbital parameters for CubeSat space mission objectives

### August, 21<sup>th</sup>, Friday

Lecture 1	CubeSat electric power system
½Lecture 2	CubeSat electric power system.
½Lecture 2	Lesson of Space Russian language
	Lunch break
Lecture 3	CubeSat mechanical design
Project *	Analysis of an electric power system implementation

### August, 22<sup>th</sup>, Saturday

Lecture 1	CubeSat Command & Data Handling system
Project *	Analysis of a Command & Data Handling system implementation.

### August, 23<sup>th</sup>, Sunday

Day-off

### August, 24<sup>th</sup>, Monday

Lecture 1	CubeSat attitude determination & control system
½Lecture 2	CubeSat attitude determination & control system
½Lecture 2	Lesson of Space Russian language
	Lunch break
Lecture 3	CubeSat development phases
Project*	Analysis of a CubeSat attitude determination & control system implementation

### August, 25<sup>th</sup>, Tuesday

Lecture 1	CubeSat telecommunication system
Lecture 2	Ground control segment
	Lunch break
Lecture 3	Development process for a CubeSat
Project *	Analysis of a CubeSat telecommunication system implementaion

### August, 26<sup>th</sup>, Wednesday

Lecture 1	Manufacturing of a CubeSat and its systems
Project *	Mission objective refining. Functional scheme development. Analysis of payload implementation options.
	Lunch break
Project *	Development of a block diagram for data exchange. Choose of a system interface. Estimating of an on-board computer.
Project *	Estimating of an electric power system. Estimating of an attitude control and determination system.

### August, 27th, Thursday

Lecture 1	CubeSat operations
Project *	Refining mechanical design, inner architecture and deployable systems
	Lunch break
Project *	Preliminary estimating of mass, energy, system interface and data-link budgets
Project *	Refinement of projects. Preparing projects to the defense.

### August, 28th, Friday

Project *	Preparing projects for the defense
Project *	Defense of projects
	Lunch break
Project *	Defense of projects
Lecture	Summing-up. SSDS-21w closing ceremony.

**\* Project difficulty level can be changed depending on students` entry qualification**