POLYTECH
Peter the Great
St.Petersburg Polytechnic
University

International Polytechnic
SUMMER & WINTER
SCHOOLS

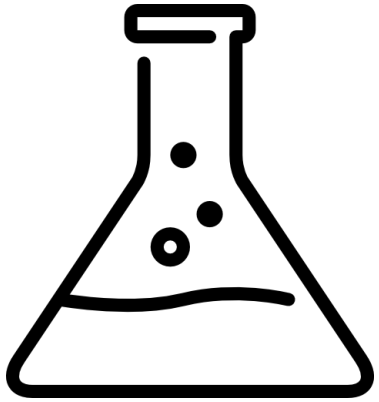
Natural Sciences and Engineering

POLYTECH

Programs in the field of “Natural Sciences and Engineering”

Summer School:

- Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)
- Biomedical Engineering (Polytech – LUH)

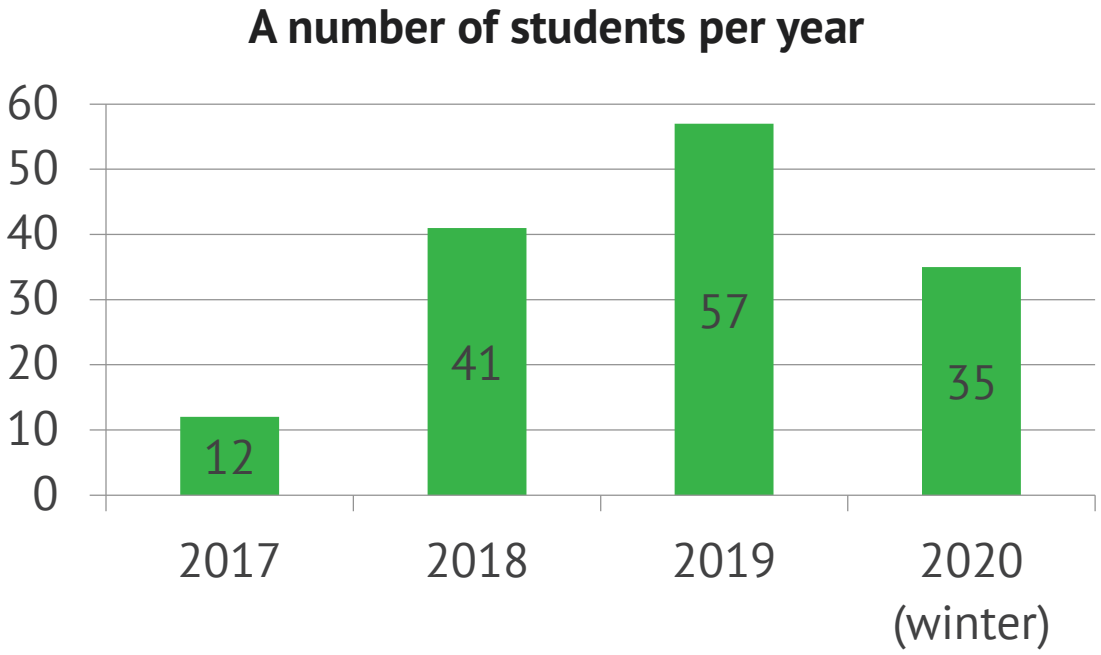


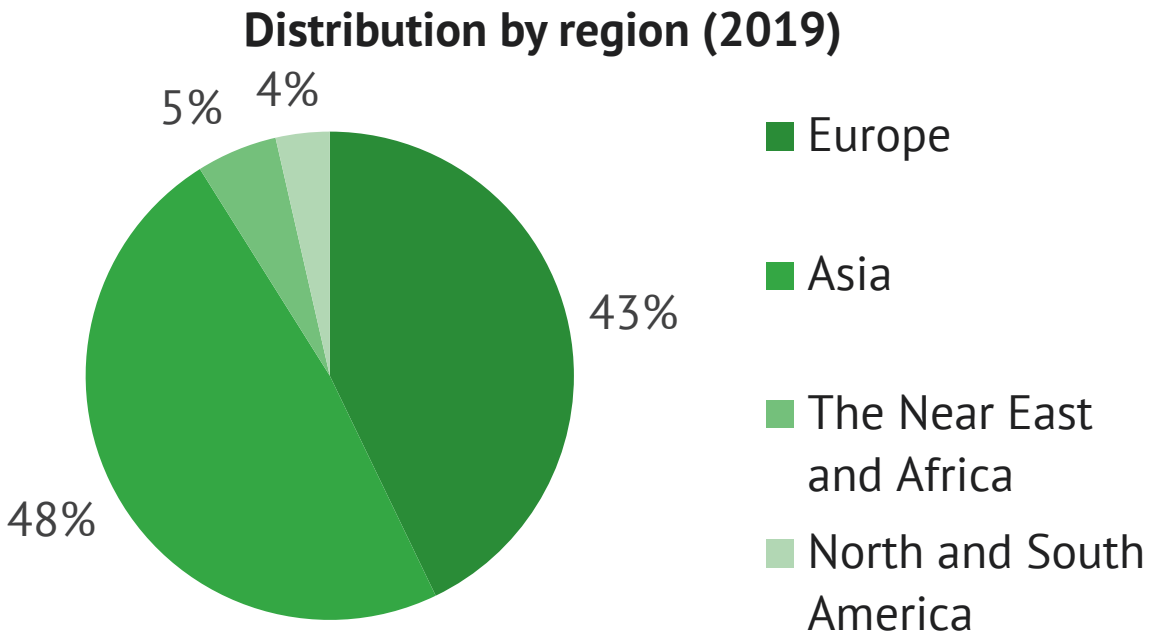
Winter School:

- Plasma Physics and Controlled Fusion

POLYTECH

Key facts





POLYTECH

Winter School “Plasma Physics and Controlled Fusion”

JANUARY 27 – FEBRUARY 7, 2020

POLYTECH

Plasma Physics and Controlled Fusion

The course is suitable as the first plasma physics course or an add-on course for senior undergraduate students and graduate students.

The primary objective of the course is to present the fundamentals of plasma physics particularly highlighting high-temperature plasma physics and its applications to controlled fusion.

The course begins with an overview of plasma phenomena and their applications. The lectures cover Coulomb collisions, single particle motion in magnetic field, magnetic traps, principles of controlled fusion, plasma heating and diagnostics.

The program also includes study visits to a tokamak laboratory and a laboratory for plasma technologies.

POLYTECH

Plasma Physics and Controlled Fusion

Program dates:
Arrival: Jan 25 – 26, 2020
Classes: Jan 27 – Feb 07, 2020
Departure: Feb 08 – 09, 2020

Duration: 2 weeks
ECTS credits: 4.0

Participation fee:
- Early bird registration fee: 510 euro
- Regular registration fee: 540 euro

Participation fee includes tuition fee, study materials, visits to companies and cultural program.

Deadline for registration:
Early bird deadline: October 28, 2019

Regular deadline:
for non-EU citizens: November 18, 2019
for EU, Iranian and Indian citizens, citizens of visa-free countries: December 16, 2019

Request the application form and submit the application package via e-mail:
summerschool@spbstu.ru

POLYTECH

Plasma Physics and Controlled Fusion. Course description:

The course is intended as the first plasma physics course however it is also suitable for senior undergraduate students and graduate students.

Plasma phenomena on Earth and in the Universe; historical overview of plasma physics; contemporary research areas and technological applications of plasmas; studies of controlled nuclear fusion.

Definition of plasma; quasineutrality, Debye length, plasma frequency.

Coulomb collisions, Rutherford's formula, Coulomb logarithm

Motion of a single charged particle in magnetic field; Larmor radius, drifts, magnetic traps.

Controlled nuclear fusion; Lawson criterion and ignition criterion.

Principles of plasma heating with electromagnetic waves and neutral beam injection.

Principles of plasma diagnostics, active and passive measurements, line-integral data, Doppler broadening.

Survival Russian.

POLYTECH

Plasma Physics and Controlled Fusion

Professors and lecturers:

- P.R. Goncharov, Ph.D., Polytech, Russia;

Program partners:

- A.F. Ioffe Physico-Technical Institute and Institute of Electrophysics and Electric Power of Russian Academy of Sciences

Plasma Physics and Controlled Fusion. Cultural program:

The cultural program includes:

- Excursion to the Hermitage, one of the world's largest and oldest museums of fine art;
- Pub Quiz;
- Excursion to the Kunstkamera museum, a cabinet of curiosity;
- Field trip to the "Baltika" Brewery/"Coca-Cola" factory where students can learn about the construction and logistic peculiarities of the plant;
- Full-day Wintry Event with sleigh riding and skating (optional for extra price).

POLYTECH

Summer School in the field of “Natural Sciences and Engineering”

JULY 13 – 24, 2020

POLYTECH

Programs in the field of “Natural Sciences and Engineering”

Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)

Biomedical Engineering (Polytech – LUH)

POLYTECH

Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)

- This is a joint program developed in cooperation with School of Physical Sciences of SOKENDAI (the Graduate University for Advanced Studies, Japan).
- The course is suitable as the first plasma physics course or an add-on course for senior undergraduate students and graduate students.
- The primary objective of the course is to present the fundamentals of plasma physics particularly highlighting high-temperature plasma physics and its applications to controlled fusion. The course begins with an overview of plasma phenomena and their applications. The lectures cover Coulomb collisions, single particle motion in magnetic field, magnetic traps, principles of controlled fusion, plasma heating and diagnostics. The program also includes study visits to a tokamak laboratory and a laboratory for plasma technologies.

POLYTECH

Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)

Program dates:

Arrival: Jul 13 – 14, 2019
Classes: Jul 15 – 26, 2019
Departure: Jul 27 – 28, 2019
Duration: 2 weeks

ECTS credits: 4.0

Deadline for registration:

Early bird deadline: - March 25,2019

Regular deadline:

- for non-EU citizens: **April 22, 2019**
- for EU and visa-free countries' citizens: **June 17, 2019**

Participation fee:
Early bird registration fee: 510 euro
Regular registration fee: 540 euro

Participation fee includes tuition fee, study materials, visits to companies and cultural program.

Masters students from FuseNet member universities can request financial support for attending the summer school through www.fusenet.eu/funds. Application for funding is available through the website as well.

POLYTECH

Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)

The course is intended as the first plasma physics course however it is also suitable for senior undergraduate students and graduate students.

- Plasma phenomena on Earth and in the Universe; historical overview of plasma physics; contemporary research areas and technological applications of plasmas; studies of controlled nuclear fusion.
- Definition of plasma; quasineutrality, Debye length, plasma frequency.
- Coulomb collisions, Rutherford's formula, Coulomb logarithm
- Motion of a single charged particle in magnetic field; Larmor radius, drifts, magnetic traps.
- Controlled nuclear fusion; Lawson criterion and ignition criterion.
- Principles of plasma heating with electromagnetic waves and neutral beam injection.
- Principles of plasma diagnostics, active and passive measurements, line-integral data, Doppler broadening.
- Survival Russian.

Professors and lecturers:

- P.R. Goncharov, Ph.D., Polytech, Russia;
- N. Tamura, Ph.D., SOKENDAI, Japan

Program partners:

- SOKENDAI: The Graduate University for Advanced Studies, Japan
- A.F. Ioffe Physico-Technical Institute and Institute of Electrophysics and Electric Power of Russian Academy of Sciences

Plasma Physics and Controlled Fusion (Polytech-SOKENDAI)

The cultural program includes:

- Boat city tour for students to get acquainted with the beauty of the city.
- Excursion to the Hermitage, one of the world's largest and oldest museums of fine art.
- Pub Quiz in the city center of St. Petersburg.
- Visit to the "Baltika" Brewery/"Coca-Cola" factory where students can learn about the construction and logistic peculiarities of the plant.
- Excursion to Peterhof palace-ensemble with picturesque gardens, a countless number of fountains and giant golden statues.
- Picnic at the seashore of the Gulf of Finland where students can enjoy Russian style barbecue (optional, for extra price).
- Excursion to Pushkin, former tzar summer residence famous for its palace and park ensemble. Students will visit the outstanding Catherine Palace with glorious Amber room (optional, for extra price).

POLYTECH

Biomedical Engineering (Polytech – LUH)

Joint program developed in cooperation with Leibniz Universität Hannover (Germany)

POLYTECH

Biomedical Engineering (Polytech – LUH)

Program dates:
Arrival: Jul 13 – 14, 2019
Classes: Jul 15 – 26, 2019
Departure: Jul 27 – 28, 2019

Duration: 2 weeks

ECTS credits: 5.0

Deadline for registration:
Early bird deadline: - March 25,2019

Regular deadline:
•for non-EU citizens: **April 22, 2019**
•for EU and visa-free countries' citizens: **June 17, 2019**
(applicable for Iranian and Indian citizens as well)

Participation fee:
Early bird registration fee: 510 euro
Regular registration fee: 540 euro

Participation fee includes tuition fee, study materials, visits to companies and cultural program.

Request the application form and submit the application package via e-mail: summerschool@spbstu.ru

POLYTECH

Biomedical Engineering (Polytech – LUH)

This course will cover fundamentals combined with up-to-date research topics in specific fields of Biomedical Engineering. Students will expand their knowledge on mass and heat transport in the human body. The lectures will also include basics of polymer science and electrospinning. The students will apply these fundamentals to the field of tissue engineering, polymeric scaffold engineering and deep temperature engineering (cryotechnology). They will learn about polymeric implants, how to design artificial lungs and kidneys as well as how to overcome the shortage of donor organs by engineering exemplarily living heart valves and vascular grafts in a bioreactor. In order to allow for long-term on-the-shelf availability, these engineered tissues have to be stored at deep temperatures in special freezers. Therefore, the students will be introduced to the topics of cryobiology and cryotechnology to be able to solve those storage requirements.

6-hours intensive course of Survival Russian is also included into the syllabus.

Professors and lecturers:

- Prof. Dr.-Ing. Prof. h.c. Birgit Glasmacher, Leibniz Universität Hannover, Germany
- Dr. Viktoria Kapralova, Polytech, Russia.

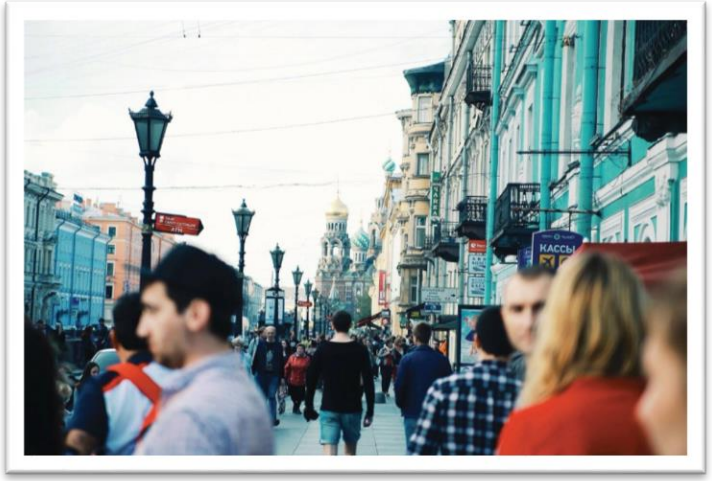
Program partners:

- LUH: Leibniz Universität Hannover, Germany

Biomedical Engineering (Polytech – LUH)

The cultural program includes:

- Boat city tour for students to get acquainted with the beauty of the city.
- Excursion to the Hermitage, one of the world's largest and oldest museums of fine art.
- Pub Quiz in the city center of St. Petersburg.
- Visit to the "Baltika" Brewery/"Coca-Cola" factory where students can learn about the construction and logistic peculiarities of the plant.
- Excursion to Peterhof palace-ensemble with picturesque gardens, a countless number of fountains and giant golden statues.
- Picnic at the seashore of the Gulf of Finland where students can enjoy Russian style barbecue (optional, for extra price).
- Excursion to Pushkin, former tzar summer residence famous for its palace and park ensemble. Students will visit the outstanding Catherine Palace with glorious Amber room (optional, for extra price).



POLYTECH

Contacts

Department of International Educational Programs

- summerschool@spbstu.ru
- +7 (812) 534-25-31
- room 227, 28, Grazhdanskii prospect, 195220, St. Petersburg, Russia