

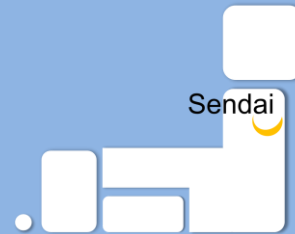


TOHOKU  
UNIVERSITY

# TSSP 2021

June 14<sup>th</sup> - July 9<sup>th</sup> 2021

Sendai



## TOHOKU UNIVERSITY **STEM** SUMMER PROGRAM: **Exploring the Frontier of Science & Technology** for undergraduates in partner universities

### About Tohoku University

Tohoku University has engaged in world-class education and research activities since its founding in 1907, and is officially authorized as “Designated National Universities in Japan” together with Tokyo and Kyoto Universities. Sendai, where Tohoku University is located, is a small “big city” and has many sites where you will have the chance to extensively experience Japanese culture.

### Program Description

The **Tohoku University STEM Summer Program (TSSP), *Exploring the Frontier of Science & Technology*** is designed specifically for freshmen and sophomores majoring in science and engineering (STEM). We will provide students with insight on what world society needs based on advanced science and technology in the future and how they can contribute to society through research, and we will offer cutting edge classes in advanced sciences and engineering.

This 4-week program consists of the following 4 parts: **(1) cutting edge science and technology being developed at Tohoku University; (2) science and technologies related to disasters and reduction of damage based on experiences of the Great East Japan Earthquake; (3) group problem-solving activities (hands-on experiments) to gain experience with the frontier science and technology; and (4) Japanese language and culture.** At the end of the program students will make a final (wrap-up) presentation on items (1) or (2) on their experience. The program includes experiments, lectures, facility/laboratory visits, presentation and fieldtrips. The following topics will be covered.

*(1) Cutting edge Science & Technology*

- *Spintronics* • *Biomolecular Design* • *Robotics* • *Materials Science* • *Information Science*

*(2) Disaster Science & Technology*

- *Earth Science* • *Disaster Science in Japan* • *Disaster Response*

*(3) Group Activities (Hands-on Experiments)*

- *Challenging Experiments for Quantum Phenomena*
- *Make and Handcraft an Efficient Motor and a Paper Airplane based on the Science and Engineering Theory*

*(4) Japanese Culture*

- *Aikido* • *Zen Meditation* • *Calligraphy* • *Flower Arrangement*

*\* Field Trips*

- *Swordsmith in Miyagi*
- *Tsunami Damaged Local Areas*
- *TOYOTA Factory in Iwate*
- *J-PARC (Accelerator Facility) in Ibaraki*

**Number of Enrollments:** 30 students

**Home Page:** <https://www.insc.tohoku.ac.jp/english/short/tssp/>

東北大学

## Eligibility

Applicants must be enrolled in full-time undergraduate degree programs at one of the listed partner institutions below (**tentative**). Freshmen and sophomores may be more suitable for this summer program.

**Australia:** Univ. of Melbourne, **China:** Tsinghua Univ., **Canada:** Univ. of Waterloo

**Singapore:** National Univ. of Singapore

**United Kingdom:** Univ. Col. of London, Univ. of York, Univ. of East Anglia

**U.S.A.:** Penn State Univ., Purdue Univ., SUNY-Albany, The Univ. of California (Berkeley, Davis, Irvine, Los Angeles, San Diego, Santa Barbara, Santa Cruz, Riverside), Univ. of Hawaii at Manoa, Univ. of Maryland, Univ. of Washington

## Application Procedures

We accept the application only from nominated students. The application details will be sent to eligible students by email.

**Application Deadline to Tohoku Univ.:** March 5, 2021 (JST)

## Credits

Participating students are required to take hands-on experiments and lectures, attend facility/laboratory visits and participate in group-work sessions, after which they will give wrap-up presentations. On completing these requirements, students are eligible for 8 ECTS\*. These credits are not conferred at Tohoku University. Students who require credits for this program should inquire at their home universities.

*\*1 ECTS credit is equivalent to 25 hours of workload. ECTS credits used to evaluate the student workload required for completion.*

## Program Cost

### Program expenses

**(80,000 (education)+ 40,000 (facilities) = 120,000 JPY)**

These program expenses have to be paid separately by the specified payment deadline of each category by credit card.

Additional non-refundable processing fee (approx. US\$ 10) will be charged for each payment.

### Accommodation expense

**(179,010 JPY)**

+ 6,630 JPY per night including tax and breakfast

Full payment is requested at the start of the program.

**= Total  
299,010 JPY**

All participants are requested to pay the total program expenses of 120,000 JPY that covers all expenses for various activities during the program by specified payment deadlines. Travel, accommodations, insurance, meals, and personal daily expenses are to be paid individually. Students are advised to have sufficient money for meals and personal expenses. Payment instructions for the program expenses will be informed to the admitted applicants.

## Scholarship

A JASSO (Japan student services organization) scholarship of 80,000 JPY will be offered to outstanding students who meet the JASSO requirements and successfully complete the program.

## Accommodation

Off-campus accommodation is ten-minutes away from Aobayama campus, where most activities are held during the program. Each student will be accommodated in a furnished individual bedroom and a bathroom. The accommodation cost is 6,630 JPY per night with breakfast. (June 13<sup>th</sup> IN, July 10<sup>th</sup> OUT)

HOTEL PEARL CITY SENDAI: <https://www.pearlcity.jp/sendai/en/>

## Insurance

Summer program participants are required to buy travel insurance in their own country BEFORE coming to Japan. Students will be solely responsible for any accidents that occur while staying in Japan. Their insurance must cover death and medical care expenses not only due to accidental bodily injury but also for sickness.

## VISA

Those who need a visa to enter Japan should indicate this on their application forms. Tohoku University will provide an invitation letter to admitted students. Passport holders of certain countries do not need a visa to enter Japan for periods of less than 90 days.

## CONTACT

Tohoku University Global Learning Center/Student Exchange Division

Email: [tssp@grp.tohoku.ac.jp](mailto:tssp@grp.tohoku.ac.jp)



# Tohoku University STEM Summer Program (TSSP) 2021 (tentative)

WEEK 1							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun
AM 9:00 - 12:00		9:00-12:00 <b>Opening Ceremony &amp; Orientation</b> Welcome Speech (Vice President, Prof. Yamaguchi) Introduction to Tohoku University (Prof. Kasukabe) Orientation for Tohoku University STEM Summer Program (Profs. Watanabe, Koike and Ohuchi) <b>Self-introduction (3 min PPT x 30=-90 min)</b> <b>Campus Tour</b>  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館501室)  Aobayama Campus	9:00-12:00 Lecture 1 <b>The 2011 Tohoku Earthquake</b> Prof. Matsuzawa  Research Center for Prediction of Earthquakes and Volcanic Eruption, Lecture room 1 (Building A (B32), Room No. 205) 地震・噴火予知研究観測センター第一講義室(A棟 (B32) 205号室)  Aobayama Campus	9:00-9:30 <b>Introduction to Quntum Theory</b> Prof. Kasukabe  9:30-11:30 <b>Challenging Experiments for Quantum Theory (1)</b> Prof. Kasukabe  Student Laboratories (A06) Kawauchi Campus	8:50-11:30 Lecture and Lab Visit 2  <b>Introduction to aircraft design</b> Prof. Nakamura  Conference Room, 2nd Floor, 1st Building (C09) Institute of Fluid Science (流体科学研究所、第1棟2階会議室)  Katahira Campus	9:00-12:00 <b>Paper Aircraft Competition 2</b> Prof. Moriya, Prof. Watanabe & Prof. Koike  Creative Engineering Center (D02) 創造工学研修センター Aobayama Campus	
	Arrive in Sendai	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)
PM 13:00 - 16:00		13:00-16:00 <b>Interactive Japanese Language</b> <b>Instructors: Ms. Backley &amp; Ms. Mikoda</b> <b>Self-introduction in Japanese</b>  Aobayama Commons (J41) Lecture Room No. 3 & 10, School of Agricultural Science (農学研究科青葉山 commons 第3及び第10講義室)  Aobayama Campus	13:30-16:30 <b>Japanese Culture 1 Ikebana (Flower arrangement)</b> Prof. Chen  Education and Student Support Center (A01), 4F Main Conference Room (教育学生総合支援センター 4階大会議室)  Kawauchi Campus	12:30-14:30 <b>Challenging Experiments for Quantum Theory (2)</b> Prof. Kasukabe  14:30-16:00 <b>Group Work of Challenging Experiments for Quantum Theory</b>  Student Laboratories (A06) Kawauchi Campus	13:00-16:00 <b>Paper Aircraft Competition 1</b> Prof. Moriya  Creative Engineering Center (D02) 創造工学研修センター Aobayama Campus	13:00-16:00 <b>Paper Aircraft Group Work</b> Prof. Moriya, Prof. Watanabe & Prof. Koike  Creative Engineering Center (D02) 創造工学研修センター Aobayama Campus	

WEEK 2							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun
AM 9:00 - 12:00		9:00-12:00 Special Lecture 1 <b>Material Science and Japanese Sword Smith</b> Prof. Ohuchi  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus		9:00-12:00 <b>Japanese Culture 2 Rinnouji Temple and Experience in Zen Meditation</b> Prof. Ohuchi & Prof. Kasukabe  Rinnouji Temple (輪王寺)		9:00-12:00 Lecture and Lab Visit 4 <b>Structural Metallic Materials for Industry Innovation</b> Prof. Yoshimi  Materials Science and Engineering (B01) Lecture room 2 (Room No. 102) (工学研究科材料科学棟(B01) 講義室2(102室))  Aobayama Campus	
		Lunch (with TU students)	8:30-18:00 <b>Field Trip (Shiroishi (Castle) and Sward Smith)</b>	Lunch (with TU students)	7:45-18:00 <b>Field Trip (Ichinoseki and Toyota)</b>	Lunch (with TU students)	
PM 13:00 - 16:00		13:00-16:00 <b>Interactive Japanese Language</b> <b>Instructors: Ms. Backley &amp; Ms. Mikoda</b> <b>Introducing Culture</b>  Aobayama Commons (J41) Lecture Room No. 3 & 10, School of Agricultural Science (農学研究科青葉山 commons 第3及び第10講義室)  Aobayama Campus		13:00-16:00 Lecture and Lab Visit 3 <b>Symmetry Breaking Create Nature</b> Prof. Tanaka  Lecture Room (2nd floor of Molecular Imaging Building(G12)), Cyclotron and Radioisotope Center (CYRIC) (分子イメージング棟(G12) 2階講義室、サイクロトロン・ラジオアイソトープセンター、北青葉山キャンパス)  Aobayama Campus		13:00-16:00 Lecture and Lab Visit 5 <b>Robotics for Space Exploration</b> Prof. Yoshida  Lecture Room Building-M.E (A02) in Aobayama campus, Lecture Room no.4 (機械系講義棟(青葉山キャンパスA02) 第四講義室)  Aobayama Campus	



# Tohoku University STEM Summer Program (TSSP) 2021 (tentative)

WEEK 3							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	27-Jun	28-Jun	29-Jun	30-Jun	1-Jul	2-Jul	3-Jul
AM 9:00 - 12:00		9:00-12:00 Lecture and Lab Visit 6 <b>Historical and Social Approaches to Disaster</b> Profs. Ebina and Boret  International Research Institute of Disaster Science (J31) Seminar room S100 (災害科学国際研究所セミナー室、S100、青葉山キャンパス)  Aobayama Campus	9:00-12:00 Lecture 7 <b>Origin of Life: The early Earth made the first life</b> Prof. Kakegawa  Earth Science Research Bldg. (H12) Room 513, 503, School of Science (理学研究科地球科学513室、503室)  Aobayama Campus		9:00-12:00 Lecture and Lab Visit 9 <b>Interactive "Content" Design</b> Prof. Kitamura  M531, RIEC Main building (G10), Katahira Campus (電気通信研究所本館5階 M531 セミナー室、片平キャンパス)  Katahira Campus		
		Lunch (with TU students)	Lunch (with TU students)	<b>8:30-18:00</b>  <b>Field Work</b> Prof. Kakegawa  (Disaster-affected area: Mnamisanriku, Arahama, etc.)	Lunch (with TU students)	<b>8:30-19:00</b> <b>Research Facility Tour</b> <b>(Japan Proton Accelerator Research Complex: J-PARC in Tokai-mura, Ibaraki)</b>	
PM 13:00 - 16:00		13:00-16:00 <b>Japanese Culture3 Calligraphy</b> Prof. Watanabe  International Exchange Building (A12) Room R115 (国際交流棟 (A12) R115室)  Kawauchi Campus	13:00-16:00 Lecture and Lab Visit 8 <b>Japanese second sample return mission: Hayabusa2</b> Prof. Nakamura  Earth Science Research Bldg. (H12) Room 503, School of Science (理学研究科地球科学 503室)  Aobayama Campus		13:00-16:00 Lecture 10 <b>Introduction to Advanced Research with Accelerator</b> Prof. Koike  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus		

WEEK 4								
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	
	4-Jul	5-Jul	6-Jul	7-Jul	8-Jul	9-Jul	10-Jul	
AM 9:00 - 12:00		9:00-12:00 Lecture and Lab Visit 11 <b>Introduction to Spintronics</b> President, Prof. Ohno  Laboratory for Nanoelectronics and Spintronics (E04) (ナノスピントニクス実験施設) A401  Katahira Campus	9:00-12:00 <b>Fastest Paper Clip Motor Competition 1</b> Prof. Moriya  Creative Engineering Center (D02) 創造工学研修センター Aobayama Campus	9:00-12:00 Lecture 12 <b>Introduction to Renewable Energy Systems: Engineering and Constructing a Solar Power Plant</b> Dr. Jan Martin WARZECHA & Ms. Shivani MEHTA  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus	9:00-12:00 <b>Group Work Session</b> <b>(Preparation for Experimental Reports and/or Wrap-up Presentation)</b>  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus	9:00-12:00 <b>Wrap-up Presentation of TSSP 2021</b>  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus		
		Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Lunch (with TU students)	Depart from Sendai
PM 13:00 - 16:00		13:00-16:00 <b>Japanese Culture 4 Aikido</b> Prof. Fujino  Kawauchi Sub Arena, 3rd Floor (B05) (川内サブアリーナ棟3F)  Kawauchi Campus	13:00-16:00 <b>Fastest Paper Clip Motor Competition 2</b> Prof. Moriya  Creative Engineering Center (D02) 創造工学研修センター Aobayama Campus	<b>13:00-17:00</b>  <b>Field Work :Introduction to Renewable Energy Systems: Engineering and Constructing a Solar Power Plant</b> Dr. Jan Martin WARZECHA & Ms. Shivani MEHTA  <b>( Kurokawa (Solar) photovoltaic power plant)</b>	13:00-16:00 <b>Group Work Session</b> <b>(Preparation for Experimental Reports and/or Wrap-up Presentation)</b>  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus	13:30-15:30 <b>Wrap-up Presentation of TSSP 2021</b> Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)  Aobayama Campus  16:00-16:45 <b>Closing Ceremony</b> 17:00-18:30 <b>Farewell Party</b>  Aoba Memorial Hall (C03) Room No. 501, School of Engineering (工学研究科青葉記念会館 501室)		