



## Research Highlight

### From Heat to Sound and Sound to Heat

Thermoacoustics has been observed and known for centuries, but the use of this phenomenon to develop engines and cooling pumps is fairly recent. It combines the fields of acoustics and thermodynamics to move heat by using sound waves. Professor Biwa and his team at the School of Engineering are engaged in research to deepen the understanding of and find practical applications for this phenomenon. Actually, this phenomenon has already found its way into practical applications such as a thermoacoustic refrigerator for the Space Shuttle and gas liquefaction processing. However, it has been limited to niche applications. The potential of such technology is extremely appealing and further improvement might lead to a more sustainable society.

## Research Highlight

### The Dawn of Spintronics



For more than a century, Tohoku University has been a leading research institution in the field of magnetic materials and gave birth to various breakthroughs such as the hard disk drive. It is thus natural that, since the discovery of giant magnetoresistance in 1988, Tohoku University has been engaged in spintronics research, science dealing with the spin of charged particles at the root of phenomena such as ferromagnetism. Spintronics has grown into a discipline of its own and the School of Engineering has been at the cutting edge of research in this field. We invite the reader to discover more about this topic at the website of the Tohoku University Research News of Engineering (TUNE) at <http://tune.eng.tohoku.ac.jp>.

## Student Interview: Luis Aparicio (Venezuela) Quest for the Ultimate Energy Source



Luis Aparicio seized the opportunity to visit Professor Hashizume and Professor Ito at the Department of Quantum Science and Energy Engineering of Tohoku University during his first visit to Japan in August 2012. This experience settled his determination to come back to Japan one day as a graduate student. After his return to Venezuela and his graduation from Rafael Urdaneta University, where he specialized in electrical engineering, he decided to apply for a MEXT Scholarship for graduate students offered by the Japanese Government and is now working on new ways to design superconducting magnets (necessary for the confinement of plasma in nuclear fusion reactor) using high-temperature superconductor technology.

## Aobayama Subway Station

### At a Handful of Minutes from Sendai



The wait will be over on December 6th with the opening of the new Tozai subway line. Commuting between the city and the School of Engineering will be greatly improved with Sendai Station being less than 10 minutes from the heart of the Aobayama Campus. It will actually take exactly 9 minutes and 250 yen to come from Sendai Station. Aobayama station is an underground station of the new Sendai Tozai subway line, whose platform is on the 6th floor underground and accessible by elevator and a series of escalators. The Tozai line will be the second subway line in Sendai. It will run from Yagiyama Zoological Park in the west through the city center to the eastern suburbs, will be approximately 14 kilometers long and will have 13 stations, all underground.

## Campus News



### OPEN CAMPUS 2015

On July 29th and 30th, the School of the Engineering opened wide its doors. This year the open campus attracted more than 8000 visitors, mainly high school students in search of information for their future educational paths. It is a unique opportunity to visit research laboratories and discover the research that is being conducted at the School of Engineering.

### TESP 2015

For the sixth year, the Tohoku University Engineering Summer Program on Robotics (TESP) was held from July 27 to August 7. This year's program attracted more than 50 participants from 26 different countries. During 2 weeks, the summer program offered various lectures given in English by worldclass professors in the field of robotics and several extra activities to immerse the participants in Japanese culture.

### THE LAB. JACKETS

It is common to spot groups of students wandering around the Aobayama campus at about noon wearing the same clothes. They actually belong to the same laboratory and wear the same personalized jacket with a motto and logo related to their field of research on the back.



Study in Japan! Study in Tohoku University!

# Exchange, Double/Joint Degree Programs for International Students in Partner Universities Overseas

## Exchange Programs

### JYPE (Junior Year Program in English)

<https://www.cefix.insc.tohoku.ac.jp/ASEP/JYPE/index.html>

Junior year students can enroll in exchange programs for one year/semester of study at Tohoku University. Courses are provided in fields of science, engineering and agriculture. All lectures are given in English. The core course of this program is the Individual Research Training course.

### DEEP (Direct Enrollment Education Program)

<http://www.insc.tohoku.ac.jp/cms/index-e.cgi?pg=100915122927=p#Deep>

Special Auditing Students [Undergraduate & Graduate]: Students can take regular courses, almost all of which are conducted in Japanese.

Special Research Students [Graduate]: Students can do research under the supervision of academic advisors at Tohoku University.

### COLABS (Cooperative Laboratory Study Program)

<https://www.cefix.insc.tohoku.ac.jp/ASEP/COLABS/index.html>

Students can join research training in assigned research laboratories based on collaboration of professors at Tohoku University and its partner universities.

## Double Degree Programs

[http://www.tohoku.ac.jp/en/academics/double\\_degree\\_program.html](http://www.tohoku.ac.jp/en/academics/double_degree_program.html)

Students can acquire graduate degrees at both Tohoku University and its partner universities. We have Double Degree Programs now with institutions in France and Sweden: Ecole Centrale Group (France), INSA de Lyon (France), KTH (Sweden).

## Joint Education Program

[http://www.tohoku.ac.jp/en/academics/double\\_degree\\_program.html](http://www.tohoku.ac.jp/en/academics/double_degree_program.html)

Students can acquire two degrees at Tohoku University and Tsinghua University (China).

# Degree Programs for International Students

- International **Doctoral** Degree Program in Engineering, Information Sciences, Environmental Studies and Biomedical Engineering:  
Course starts: Oct. 1  
**Application Deadline: Late May**  
Contact: [eng-in@grp.tohoku.ac.jp](mailto:eng-in@grp.tohoku.ac.jp)  
<http://www.eng.tohoku.ac.jp/english/admission/procedure/doctoral.html>
- International **Doctoral** Degree Program in Mechanical and Aerospace Engineering Course (IMAC-G)  
**Master, Doctoral** course:  
Course Starts: Oct. 1  
**Application Deadline: Mid. Apr.**  
Contact: [imac-g@mech.tohoku.ac.jp](mailto:imac-g@mech.tohoku.ac.jp)  
<http://g30.eng.tohoku.ac.jp/imac/>
- International **Bachelor** Degree Program in Mechanical and Aerospace Engineering Course (IMAC-U)  
**Bachelor** course:  
Course Starts: Oct. 1  
The Application Guide for the IMAC-U course (October 2016 enrollment) will be announced in late October 2015.  
Contact: [imac-u@mech.tohoku.ac.jp](mailto:imac-u@mech.tohoku.ac.jp)  
<https://www.fgl.tohoku.ac.jp/>



## Academic Exchange Agreements with Foreign Institutions

### Tohoku University Level

Foreign Institutions with Academic Exchange Agreements: 185

<http://www.bureau.tohoku.ac.jp/kokusai/exchangej/scientificj/f2-1.html>

### School of Engineering Level

Foreign Institutions with Academic Exchange Agreements: 69

<http://www.bureau.tohoku.ac.jp/kokusai/exchangej/scientificj/f2-2.html>

## Regular Degree Programs

International students can also apply (in English) to the degree programs which most Japanese students take. Please find details from the website below

<http://www.eng.tohoku.ac.jp/english/admission/programs.html>

## Tohoku University Alumni “Shuyukai”

The alumni association aims to promote interaction and exchange among its members, thus strengthening ties to the Tohoku University community. The Alumni Association holds Home Coming Days as well as regional gatherings to provide alumni association members the opportunity to connect and remain in touch with Tohoku University. Please find the information on exchange events.

<http://www.tohoku.ac.jp/en/alumni/index.html>

