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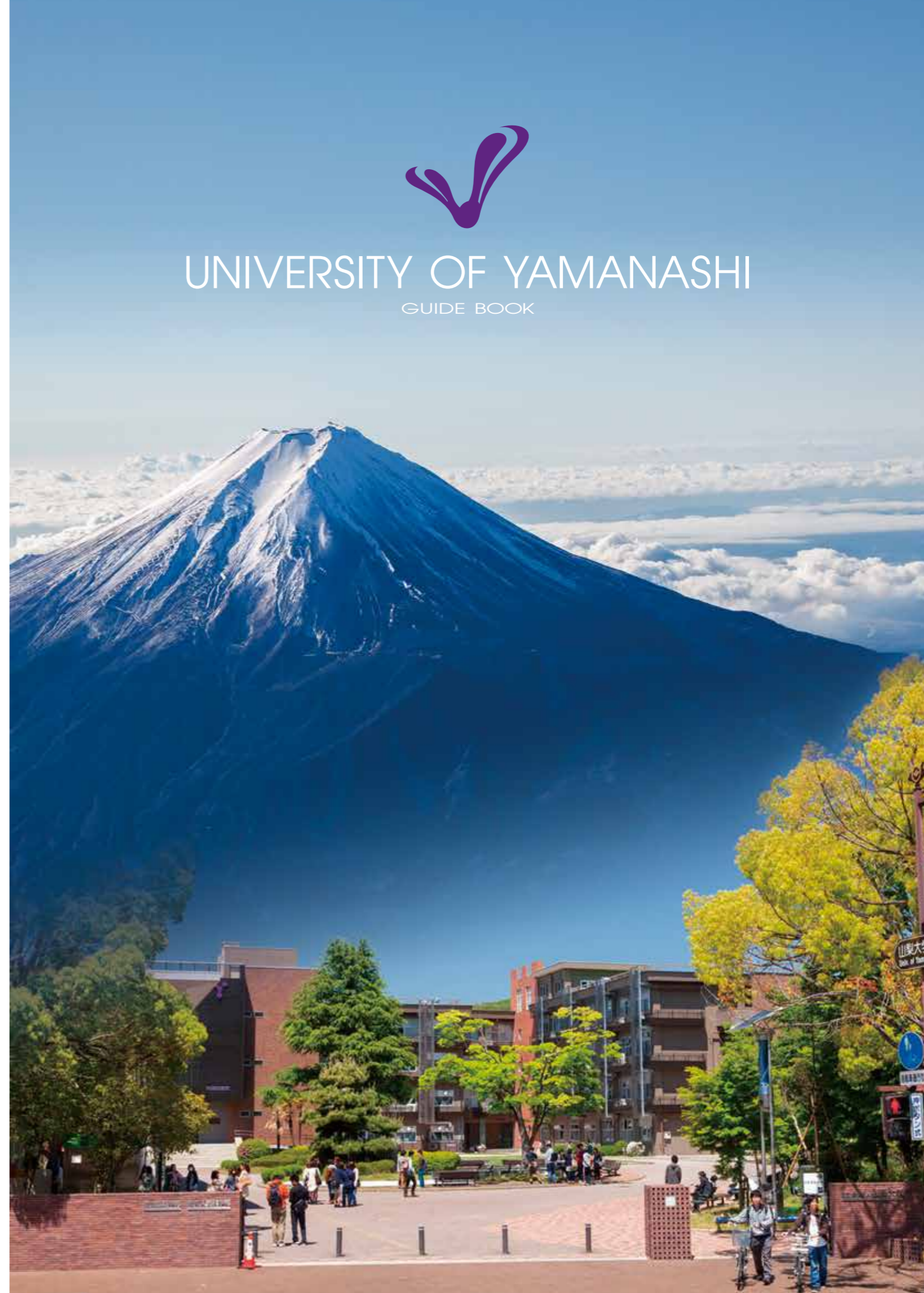
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UNIVERSITY OF YAMANASHI  
 GUIDE BOOK

# Welcome to Yamanashi!

-Show various facial expressions-



## World Cultural Heritage "Mt. Fuji"

- Subject of faith and the source of art -

### Fruit Kingdom!



### Producing area of Japanese wine!



### Scenic landscape



### Symbol of Sengoku period "Takeda Shingen"



### Unique culture etc.



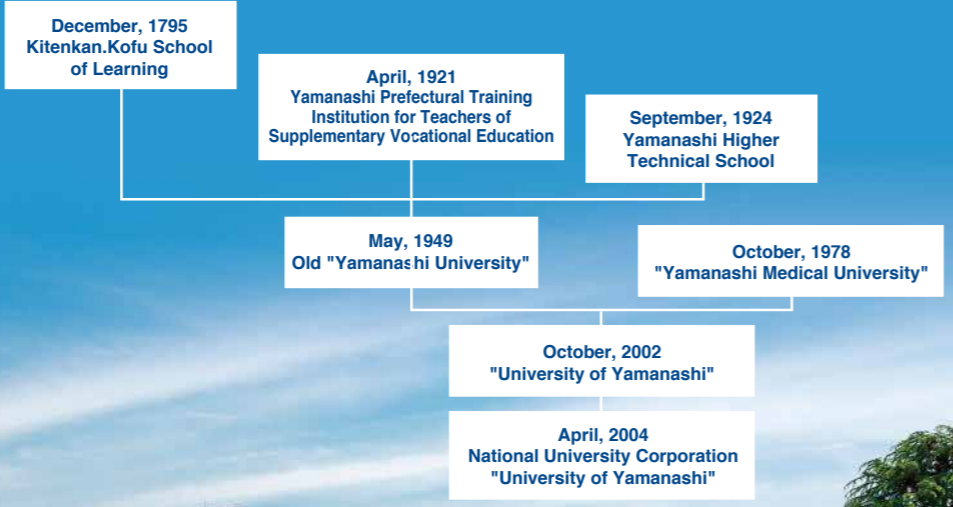
### The Linear Chuo Shinkansen

Planned opening  
2027 (Tokyo Shinagawa – Nagoya) and 2037 (Nagoya – Shin-Osaka)





Shinji SHIMADA, M.D., Ph.D.  
President, University of Yamanashi



# Satoshi Ōmura Museum

A new, dynamic forum for academics, culture, and art

Dr. Satoshi Ōmura, a 1958 graduate of the University of Yamanashi's Faculty of Liberal Arts and Sciences (now the Faculty of Education) won the Nobel Prize in Physiology or Medicine in December 2015.

In commemoration of that monumental achievement, the University of Yamanashi created the Satoshi Ōmura Memorial Scholarship Fund and established the Satoshi Ōmura Museum to honor Dr. Ōmura's tremendous accomplishments and preserve his legacy for future generations.

The entrance to the Satoshi Ōmura Museum, which abuts Takeda-dōri on its way to Takeda Shrine, features a unique, compelling design that invokes the octagonal, three-story structure of the second Kitenkan—a branch of the Shōheikō (a state-run school under the Edo shogunate) that would later go on to become the Faculty of Education at the University of Yamanashi.

The first floor of the museum houses several exhibit areas, showcasing not only a variety of valuable items relating to Dr. Ōmura's Nobel Prize and academic triumphs but also a wealth of academic items and cultural pieces that offer revealing glimpses into the University of Yamanashi's storied past. On the second floor, meanwhile, is Ōmura Memorial Hall: a space available to students, faculty, alumni, and the local community.

The University of Yamanashi is a "Center of Community," a backbone institution for the entire region. That symbolic identity has taken on a deeper, richer significance with the creation of the Ōmura Museum, which represents a core hub for the community on a far-reaching scale, nurtures and showcases academic, cultural, and artistic endeavors, and symbolizes a new chapter in the history of the University of Yamanashi.

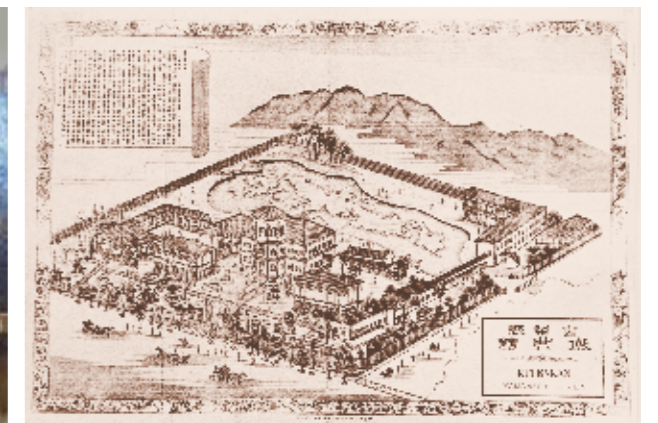


## Dr. Ōmura exhibit

This collection delves into Dr. Ōmura's remarkable life and career, featuring photographs, original copies of graduation papers, examples of numerous research projects, and a wealth of items that cast an illuminating light on his Nobel Prize triumph.

## Kitenkan exhibit

Visit this exhibit for a peek into the Kitenkan, the Shōheikō (Edo shogunate-run institution) branch school that would develop into the University of Yamanashi. In this exhibition area, museum-goers will find fascinating archival evidence from the late-eighteenth-century onward, the Kitenkan monument, an ink impression of the institution's motto, and more.





# Clean Energy Research & Research on Fuel Cell Nanomaterials

Energy issues represent one of the biggest crises currently confronting humanity. Considering the pressing need for solutions to those problems, the demand for rapid, drastic improvements in technologies for the conversion and storage of “green energy”—a core component of Japan’s national growth strategy—is strong.

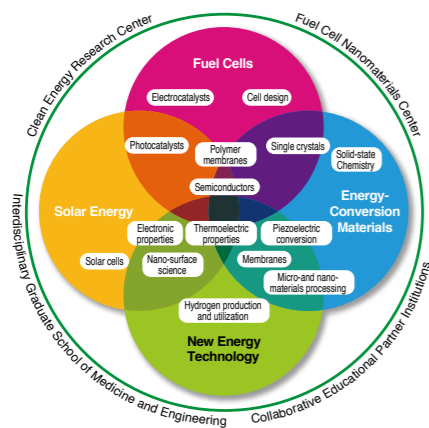
The University of Yamanashi is striving to be a global hub for advances in clean energy. By creating world-class research facilities and developing a host of graduate-education programs (see below), the University is propelling its education and research activities forward through a unique educational structure, a distinctive curriculum, and close ties with industry, government, and academics.

## Special Doctoral Program for Green Energy Conversion Science and Technology (graduate school)

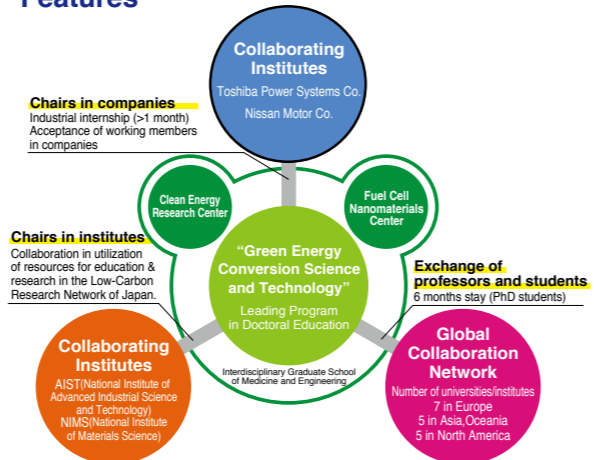
The purpose of this program is to nurture leaders who can make green innovation happen in a global setting, drawing on a broad perspective in energy conversion science and technology and its economic aspects. The program uses an educational approach with a vision shared by industry, government, and academics.

The program has three core focus areas: developing innovative technologies for the efficient, economical conversion and storage of green energy in hopes of realizing a low-carbon, sustainable society, achieving an optimal balance of energy-conversion devices, and using findings to pave the way toward green innovation. Through an instructional approach that integrates basic and practical studies, the program aims to develop global leaders capable of making an important impact in those key areas.

These issues can be divided into the following four fields (please refer to the diagram)

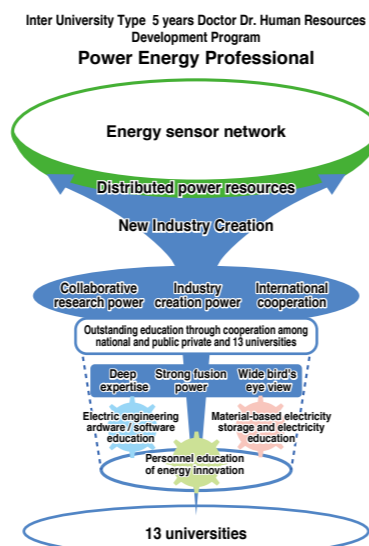


## Features



## Power Energy Professional Training Program (Doctoral Program for World-leading Innovative & Smart Education)

The Power Energy Professional (PEP) Training Program is a five-year doctoral program for cultivating “knowledgeable professionals” with the abilities to lead a variety of sectors in the creation of new industries by optimizing the energy-value chain, a core element of Society 5.0. Selected as a “Doctoral Program for World-leading Innovative & Smart Education” by the Ministry of Education, Culture, Sports, Science and Technology, the PEP Training Program embodies the Ministry’s vision of establishing organizational links with external partners—elite universities, private businesses, and other institutions around the world—to create a hub of world-class education and research. The University of Yamanashi will continue to develop doctoral human resources with advanced expertise for creating new industries in the power and energy sectors and work to lay a solid foundation for the sustainable development of skilled professionals, meaningful exchange, and new collaborative research.



Aspiring to be a center of research and human-resource development for Japan’s green-energy sector !

## Clean Energy Research Center

The Clean Energy Research Center at the University of Yamanashi, comprising the Division of Fuel Cell Research and the Division of Solar Energy Conversion Research, promotes research on clean energy (areas such as fuel cells, hydrogen production, CO<sub>2</sub> fixation, and energy) harvesting in hopes of contributing to solutions to issues concerning energy and the global environment. By providing undergraduates and graduate students with direct educational and research-oriented guidance, the Center balances its research initiatives with a commitment to transforming learners into motivated, capable human resources in the relevant specializations.



## Fuel Cell Nanomaterials Center

In hopes of laying the groundwork for “hydrogen society” through full-scale utilization of fuel-cell technology, the Fuel Cell Nanomaterials Center draws on a team of expert researchers—from around the world and across the industrial spectrum—and a host of world-class, cutting-edge evaluation and analysis facilities to tackle national initiatives, joint-research projects with the industrial sphere, and graduate-level education. That diverse scope of engagement is a core feature of the Center, which strives to produce research with both progressive and practical dimensions and provide the researchers and engineers with the hands-on training they need to be driving forces in the fields of hydrogen and fuel-cell technology.





# Special Graduate Programs on River Basin Environmental Sciences

The Interdisciplinary Centre for River Basin Environment (ICRE) fosters young experts who can understand the diversity of given regions and communities, identify area-specific environmental and water issues, and implement practical solutions. Together, we engage in flood and drought risk analyses, the conservation and relocation of water resources, the identification of pollution sources and processes, the development of locally fitted treatments for drinking and wastewater, the evaluation of health socioeconomic impacts, and more.



## Diploma policy

- To fulfill these missions, the graduate programs aim to enhance students' integrity to:
  - "Understand diversity" of climate, culture and development levels for creating plan and methodology fitting to the regionality.
  - Use "wide knowledge" on river basin environmental issues: analysis and visualization of data, planning and wellbeing, basics of hydrology/water chemistry/microbiology/environmental technologies.
  - "Independently" conduct the plan-do-check cycle based on sustainable development.
  - "Collect and disseminate information" for application and development of own speciality to different fields.
  - "Build consensus" among stakeholders through negotiation.



## Links between world-class water sciences and education

- Students gain a trans-boundary knowledge of hydrology, quality, microbiology, sanitary engineering, planning, and medicine from experts of environmental sciences.
- Students develop collaborative skills through placements (practicum), fieldworks and the "International Exchange Program".
- The alumni network, Science Union for river basin Researches and Friends (SURF), support students and researchers to pursue their studies in different environments collaborative projects.



## Establishing an international standard

- "Multiple Supervisor" and careful, thorough guidance through "Closed Discussions" every semester
- Flexible connections between master's and doctoral courses
- A rigorous evaluation system for degree assessment (mid-term assessment and final defense)
- A multi-nationality environment (students from 17 countries, international co-supervision, and coursework in English)
- Support for student life (cross-cultural events, career guidance for international students, scholarships, travel support, and more)

## Scholarship

- Japanese Government (MEXT) Scholarship for master's course
- Support for tuition fee from our course (ICRE)
- Research assistant fee for doctoral student from our university
- Partial scholarship for doctor students from our university

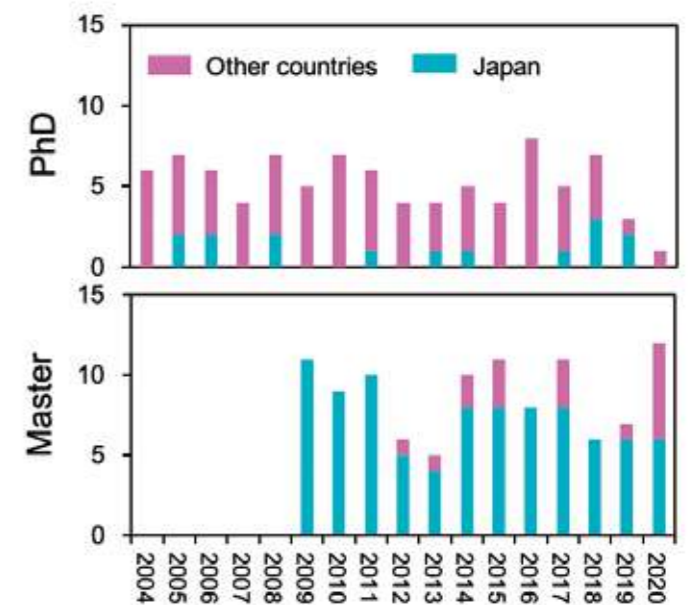


## Career paths

- Private-sector fields like environmental consulting, survey work, analysis, plant planning and construction, and informatics
- Government
- Academic institutions
- Environmental NGOs



## Enrollment statistics



## History

- 2003-2007 Selected for the 21st Century COE Program by the Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- 2004 International Special Doctoral Course for Integrated River Basin Management established
- 2006-2011 Selected as a Priority Graduate Program (PGP) for doctoral education by MEXT
- 2007 ICRE established
- 2008-2012 Selected as a Global COE by MEXT
- 2009 International Special Master's Program on River Basin Environmental Science established
- 2014-2018 Selected as a PGP for doctoral education by MEXT
- 2014-2018 Science and Technology Research Partnership for Sustainable Development (SATREPS) Project in Nepal implemented by JICA/JST
- 2016 Integrated Graduate Program established

## Network: More than 70 PhD alumni





## Wine Science



We have a long history, dating back to 1947, as the a unique research institute specializing in wines and wine grapes in Japan since 1947. Playing a central role on in wine science, and isthe Institute of Enology and Viticulture strives to advancing advance wine studies and wine-making technologies in Japan.



## Education

Educators at the The staff of The Institute of Enology and Viticulture teach wine science from at the basic, practical, or and academic levels. For undergraduate students, we have a special course for "Wine Science " in the Department of Local Produce and Food Sciences in the Faculty of Life and Environmental Sciences. The institute also runs a unique vocational education system named the "Wine Frontier Leader Training Program," a unique vocational education system for wine specialists.



## Research

AimingWith the aim to support the wine industry in Japan, this the Institute of Enology and Viticultureinstitute consists ofcomprises research groups focusing on wine microbiology and biotechnology, bio-functional science, and fruit genetic engineering, as well as, and an extension section for winerywineries. By building on links with Oenoviti International, an international wine organization "Oenoviti international" , the institute Institute studies wine science from a global point of viewperspective.

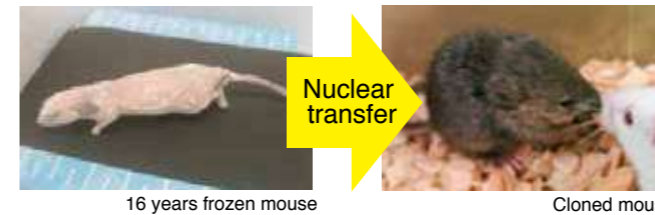


## Advanced Biotechnology

At the Advanced Biotechnology Center (ABC), we conduct a variety of "unique" experiments—investigations that some might associate with the realm of science fiction. For example, we are trying to generate offspring from extinct animals via cloning, exploring the possibilities of freeze-dried (instant) sperm, and using the International Space Station (ISS) to investigate reproductive biology. One of the only research centers of its kind in the world, the ABC also boasts a unique array of 17 micromanipulators for experimentation.

### Cloned mice from frozen dead cadavers preserved for 16 years

One of our landmark achievements was the creation of healthy cloned mice "resurrected" from dead mice that had been frozen for 16 years. This achievement led to widespread speculation that resurrecting the woolly mammoth and creating a real-life "Jurassic Park" might no longer be very far off.



### Cloned mice from urine-derived cells

Endangered species are still alive, but collecting donor cells from the species without injuring the corresponding body is a significant challenge. Using urine-derived cell nuclei, we can generate clones non-invasively.



Cloned mice from urine

### Study for mammalian space reproduction

The environment in space is vastly different from that on Earth, with its high levels of space radiation and microgravity. The effects of these factors on mammalian reproduction are largely unknown. We are studying those effects through experimentation on the ISS.

-Space Pup Project: To investigate the effects of space radiation, freeze-dried sperm are launched to the ISS and will preserve there for up to 6 years. The first space pups derived from space preserved sperm on the ISS for 9 months were born without any mutations.

-Space Embryo Project: To investigate the effects of microgravity, mouse embryos will be launched to the ISS and cultured by astronauts in a zero-gravity environment.



First space pup

One of the ABC' s distinctive features is its collection of micromanipulators. Not only is the array large in number, but the equipment is highly specialized and configured for mammalian embryo manipulation—a process that will enable experiments that have never been tried or even dreamed of. Another important aim of the ABC is to foster researchers for future generations through its research activities. For students with an interest in pursuing these kinds of experiments and learning micromanipulation techniques, the ABC is the best place in the world.





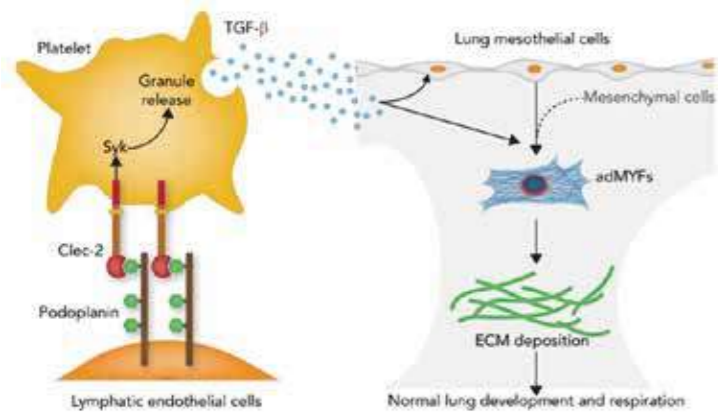
## Recent Key Topics in Medical Research & Education

## Advanced Brain Science

### RESEARCH

- **Innovative Brain Research (see page P.13)**
- **Platelets Beyond Thrombosis**

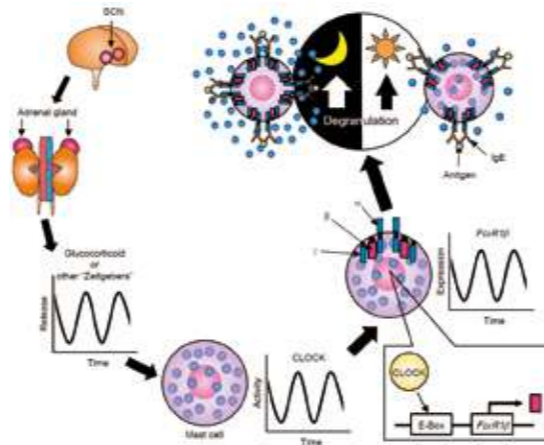
Platelets are a main player to stop bleeding. A study from the Department of Clinical and Laboratory Medicine has revealed a new and astonishing role of platelets in the regulation of normal lung development (Blood. 2018 Sep, one of their imaging data is on the cover).



Nagaharu Tsukiji et al. Blood 2018;132:1167-1179

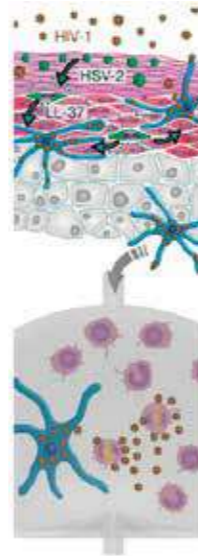
- **Time of Day Regulates Allergy**

Allergic disease (e.g. asthma, hay fever) is characterized by marked day-night changes in the clinical symptoms and laboratory parameters of allergy. Studies from the Department of Immunology have shown that the circadian clock, which drives a biological rhythm with a periodicity of approximately 24 hours in behavior and physiology, underpins a time of day-dependent variation in allergic reactions (J Allergy Clin Immunol. 2018 Oct). \*Their research summary is on the cover of Allergy 2015 May).



- **How Sexual HIV Transmission Promoted**

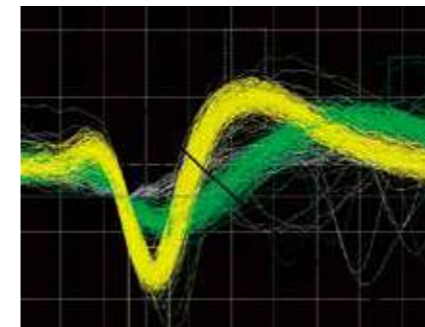
A strong association between the acquisition of HIV and other sexually transmitted diseases (STDs) has been indicated, but, the causal link remains unclear. A study from the Department of Dermatology has shown that Herpes simplex virus (HSV)-2 enhances sexual transmission of HIV by increasing HIV susceptibility of immune cells (Cell Host Microbe. 2013 Jan).



This special program aims to train (1) basic neuroscientists with full command of various techniques and research activity in brain function and molecular imaging, (2) researchers and educators specialized in developmental brain science with broad background of social medicine and education, and (3) interdisciplinary scientists aware of issues of aging population and those specific to Yamanashi, such as neuropsychiatric disorders. The last type of scientist would be expected to act for the realization of healthy life and longevity.



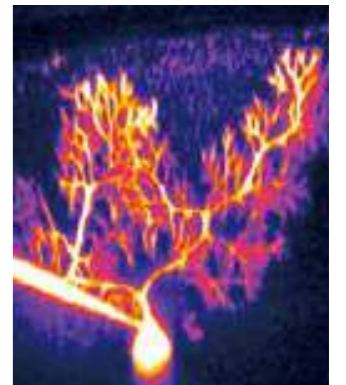
### Top-level neuroscience with a worldwide network



This program includes a wide variety of laboratories in various fields, including biochemistry, neurophysiology, system neuroscience, neuropharmacology, immunology, cell biology, structural biology, social medicine, neurology, neurosurgery, and neurorology. Students have opportunities to gain multiple specialties, broad coverage of neuroscience, and techniques in different discipline. The principal investigators have a worldwide human network in their discipline, having students interact with foreign researchers from different fields.. To motivate the students, we prepare an annual international conference inviting brilliant scientists from all over the world. Attending this, participants have an access to high-level experimental skills and can polish their ability in scientific discussion.

### Multidisciplinary rotation training program

Students can visit several laboratories to master new techniques and gain knowledge of their unfamiliar fields in neuroscience, for example, electron microscopy, system neuroscience and so on. Furthermore, we offer an interdisciplinary lecture course given by specialists outside of this university, such as those majoring theoretical physics, nanophotonics, and developmental engineering. This enables the enrolled students to be aware of differences in culture that resides in each discipline in terms of perspectives, methodologies, and roadmap for research. Going through this program, students will get insight into how to integrate different kind of knowledge to create novel ideas.



### EDUCATION

- **Special Program to Foster Physician Scientists : "Life Science Course"**



This unique course is designed specifically for undergraduate students who have strong desire to become physician-scientists and advance medicine. This course serves educational programs that enable students to obtain core research knowledge and skills, the way of logical thinking and making good presentation.



### Training for polishing presentation and discussion skill

The program provides monthly meeting where young scientists, such as postdoctoral fellow and research associate, attend to supervise the progress reports of students. . Enrolled graduate students present the progress and discuss them in detail with attendees. Through this training, they can learn how to present themselves in terms of science and researcher in an effective and appealing manner. During this seminar, they will find pitfalls and lack of insights in their own research strategy, and get an opportunity to critically review the hypothesis. Consequently, this program provides the student to foster the skills for presentation and discussion that will appeal to worldwide audience, and hopefully the serendipity.

# University of Yamanashi Hospital

Advanced medical care and cutting-edge technologies



## 1. Operating room with intraoperative MRI technology for Neurosurgery

Intraoperative mobile 3-tesla MRI scanner advances surgical safety and reliability to a new level. This mobile MRI scanner is usually stored in the neighboring room and is moving toward the patient in the operating suite via ceiling-mounted rails.

Intraoperative MRI plays a pivotal role in the brain tumor resection by confirming surgical information including brain shift and residual tumor while the patient is undergoing surgery. Higher quality resolution of 3-tesla MRI can also improve the resection rate since it provides precise tractography and MR spectroscopy.



## 2. Robot-Assisted Laparoscopic Surgery

- 1) Urology: Prostate cancer, Kidney cancer, Urinary bladder cancer
- 2) G-I Surgery: Gastric cancer, Colo-rectal cancer, Esophageal cancer
- 3) Thoracic Surgery: Lung cancer, and mediastinal cancer
- 4) Gynecological Surgery: Uterine cancer

### da Vinci®: A sophisticated robotic system for assisted-endoscopic surgery

The da Vinci system, a robotic apparatus, features an arm for holding 3D camera and 3 interactive arms capable of holding forceps, scissors, bovies and scalpels. Using the da Vinci® system, doctors can perform meticulous, high-precision surgeries — many of which would be unfeasible under traditional laparoscopic approaches — in a safe, and smooth fashion.

In 2013, daVinci® Si was introduced into our hospital first in Yamanashi Prefecture, and new type daVinci® Xi and X were introduced in our hospital in 2019.

From 2018, more than 10 types of surgeries (prostate cancer, partial nephrectomy for kidney cancer, radical cystectomy for urinary bladder cancer, total gastrectomy and partial gastrectomy for gastric cancer, rectal cancer, lung cancer, mediastinal tumor resection, uterine cancer and so on) have been performed. In August 2020, 500 cases for only urological diseases will be performed.



daVinci Xi®



Patient cart of daVinci® Xi with 48mm-diameter arms



daVinci® X

## 3. Cardiovascular Surgery TAVI (Transarterial Aortic Valve Implantation) in Hybrid Operation Room

Transcatheter valve interventions are rapidly developing as an alternative to surgery for high-risk patients. Hybrid operating rooms (ORs) allow cardiac surgeons and interventional cardiologists to work together to perform minimally invasive procedures such as transcatheter aortic valve implantation (TAVI).

### TAVI: Transcatheter aortic valve implantation

TAVI, a new approach to the treatment of severe aortic stenosis, minimizes physical strain so that many patients who have been unable to tolerate the burden of conventional surgeries can get the vital treatment they need. In 2017, the University of Yamanashi Hospital became the first institution in the prefecture to perform a successful TAVI procedure. Until June 2020, almost 80 cases of TAVI for fragile elderly patients have been performed successfully and safely.



Aortic Valve Device for TAVI

The angiography system in the University of Yamanashi's hybrid OR; Artis Zeego® equipped with robotics, not only allows doctors to perform surgical procedures and intravascular treatments simultaneously but also features a multi-joint arm that facilitates operations in complicated surgical positions.

Various clinical applications are possible using Hybrid OR, not only TAVI (trans aortic valve implant), but also the followings; endovascular treatment, intraoperative diagnosis, or hybrid surgery for neurovascular diseases including acute cerebral ischemia, atherosclerotic diseases, intracranial aneurysm, arteriovenous malformation, dural arteriovenous fistula, and spinal arteriovenous malformation.



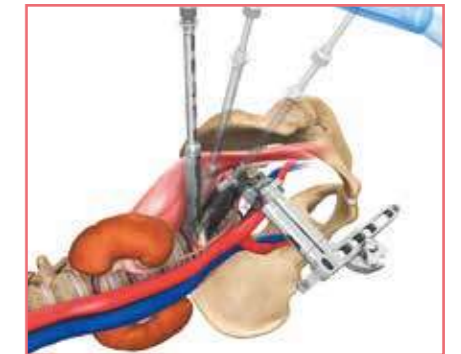
The University of Yamanashi's hybrid OR; Artis Zeego®

## 4. Orthopaedic Surgery: O-arm-navigated spine surgery

In the University of Yamanashi Hospital, operation room has 2 sets of O-arm® 3D Surgical Imaging System for Spinal Surgery Imaging. Our Hospital is the only one Governmental University Hospital in Japan, equipped with 2 sets of O-arm® System. O-arm® surgical 3D imaging technology allows precise and minimally-invasive procedure during complex spine surgeries. Therefore, our spine team allows those minimally-invasive surgeries in 2 patients (adult or pediatric) with spinal deformity perally. The O-arm® system provides guidance during complex spine surgeries and provides the following advantages over C-arm fluoroscopes currently in use. These advantages include:

- 1) The O-arm® can be positioned without moving the patient, the ring-shaped gantry can be both opened and closed.
- 2) Ultra-fast imaging reduces x-ray exposure of patients and staff
- 3) Detailed 3-D surgical site images are available for surgeon viewing in seconds, not minutes. This feature is ideal as surgeons confirm precise placement of hard and may help eliminate need for future revision surgery.

OLIF (Oblique Lateral Interbody Fusion): Novel Minimally-invasive spine surgery

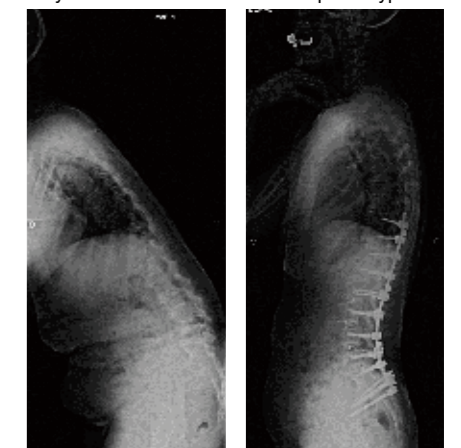


OLIF

70 years old Female with Adult Spinal Kyphosis



O-arm® 3D Surgical Imaging System



Before OLIF

After OLIF



## 5. University of Yamanashi Hospital, Radiation Therapy Center

is a clinically high volume and high precision radiotherapy center in Japan, and a leading research center in concerning advancement and development of new technology and methodology for radiotherapy. The followings are our radiation treatment modalities.

### 1) SBRT, IMRT, and IGRT

SBRT (stereotactic radiation therapy) and IMRT (Intensity-Modulated Radiation Therapy)-applicable Linear accelerator can be provided with Image Guided Radiation Therapy (IGRT) using high-speed on-rail (self-moving) CT, that was developed in our university hospital.



University of Yamanashi Hospital's original Radiation Therapy Apparatus

### 2) The TomoTherapy® System

is among the most revolutionary innovations in the history of cancer treatment, completely redefining the standard for individualized and precise treatment of tumors anywhere in the body — while creating a new paradigm for patient comfort and quality of life. The first truly complete Image-guided radiation therapy (IGRT) and intensity-modulated radiation therapy (IMRT) solution. TomoTherapy combines integrated CT imaging for exceptional treatment accuracy with a first-of-its-kind helical treatment delivery platform that uses patented beam-shaping technology to precisely target tumors while minimizing impact on surrounding healthy tissue.

University of Yamanashi Hospital is the 1st Governmental University Hospital, in which The TomoTherapy® System was installed in Japan. Tomotherapy® device delivers excellent therapeutic effects by targeting radiation at specific tumors with pinpoint accuracy and thereby minimizing negative impact on normal tissue.



### 3) Image-guided brachytherapy system

Brachytherapy is an Internal irradiation therapy for cancer. A small capsule with 2mm diameter which seals with Radioisotope is inserted into and around cancer tissue. Brachytherapy can provide directly radiation energy to cancer tissue.

### 4) Proton therapy

Proton therapy is a type of radiation therapy — a treatment that uses high-energy beams to treat tumors. Radiation therapy using X-rays has long been used to treat cancers and noncancerous (benign) tumors. Proton therapy is a newer type of radiation therapy that uses energy from positively charged particles called protons. Proton therapy has shown promise in treating several kinds of cancer.

Studies have suggested that proton therapy may cause fewer side effects than traditional radiation, since doctors can better control where the proton beams deposit their energy. Proton therapy isn't available in the University of Yamanashi Hospital, but in an affiliated hospital.

### 5) Cyber knife®

CyberKnife® radiosurgery, also called stereotactic radiosurgery, is a form of radiation therapy that delivers high-dose radiation on an exact area of the body. CyberKnife® radiosurgery targets and treats tumors in the body with very minimal damage to surrounding healthy tissue, which is the primary cause of cancer treatment side effects. Because of this, it is an excellent alternative to traditional cancer treatments, such as radiation, chemotherapy and surgery. CyberKnife® radiosurgery isn't available in the University of Yamanashi Hospital, but in an affiliated hospital.



## 6. Department of Emergency and Critical Care medicine

The department of Emergency and Critical Care Medicine provides primary emergency care and advanced emergency care (critical care) on a prefecture-wide basis. Ever since the 2011 East-Japan big earthquake and tsunami, the Hospital has also been bolstering its Disaster-medicine capabilities. One of the key components of those efforts is the Hospital's rooftop heliport, which makes it possible to transport emergency patients quickly and meet the needs for Emergency medical care and Disaster medicine more effectively.

The ER (emergency room) provides care to patients with urgent medical conditions carried by an ambulance and takes charge of emergency duty in this area. The department provides care for critically ill patients presenting to the ICU (intensive care unit) with the highest quality. The equipment for artificial organ support including ECMO (extracorporeal membrane oxygenation) is ready to use for patients those who are in life-threatening conditions in the ICU.



## 7. Attached hospital redevelopment project

As the only advanced treatment hospital in Yamanashi Prefecture, the University of Yamanashi Hospital must offer the latest medical care. To enhance advanced medical care and acute patient care, hospital redevelopment projects have been launched.

The new ward stage I building was completed in June 2015 and opened in December of the same year. The main focus of this project was the strengthening of the surgical department and areas that handle emergency/disaster medical care. In the surgical department, an MRI operation room equipped with the first Mobile 3-tesla High-field MRI Scanner in Japan and a Hybrid Operating Room are two of the highlights of the redevelopment project.

### ■Completion of new ward (stage II)

Construction was started on the new Ward II building in October 2018, and was completed in June 2020. After the preparation period, the hospital is scheduled to open in October, 2020. There are six special features of the stage II building: on the first floor near the front entrance, a new admission and discharge support center has been added; a negative pressure room with a separate flow line is now on each floor; an RI room is on the second floor; an in-hospital class and play room is on the fourth floor, a sterile area where nursing operations can be performed is on the seventh floor, and special large rooms about the size of four hospital beds have been added.

### ■We will proceed with the redevelopment plan with the aim of further enhancing hospital functions.

We are proceeding with renovation work on existing facilities such as the administration department (New Ward III Stage Wing), the central medical ward, and the special medical ward. Our goal is to build an infrastructure that allows hospital management to run smoothly, based on our long-term prospects for the next 30 years.



Center photo: New ward Stage II building Right photo: New ward Stage I building



New ward Stage II building entrance



Hospitalization Support Center



Negative pressure chamber (Pediatric)



a sterile area where nursing operations can be performed



External appearance of New Ward Stage II



RI hospital room



playroom



Special room

## Active International Students! (Interviews in 2020.5)



**VU HONG NAM (From Vietnam)**

Integrated Graduate School  
—Doctor's Course (3rd Year) Medicine

In Vietnam, Japan is considered a technically highly developed country in the world. That is why I am always interested in studying and doing research in Japan. I learned about the Department of Radiology at University of Yamanashi through

an introduction by a friend of mine who has just obtained a Ph.D. diploma from University of Yamanashi. My specialty is radiation therapy, and I have been given the wonderful opportunity to study cutting-edge technology of cancer treatment, and I am currently devoting myself to obtain my Ph.D. degree. I am very proud to be learning at University of Yamanashi Hospital, in the Department of Radiology. This is the famous department with the global professor, Prof. Hiroshi Onishi, and the high-technology equipment. Here, international students will find a professional and friendly environment to study. We are encouraged and supported to develop our research by the mentors, colleagues as well as medical staff who are willing to help. We have a feeling of being at home with those kind friends. In addition, the safe and fresh living environment makes the students feel comfortable and helps us concentrate on our work. Yamanashi is also well-known for tourism with Mount Fuji and variety of fruits. I find every day interesting and enjoyable.

I would like to thank my noble professor Onishi of University of Yamanashi, as well as my dear colleagues who have helped me with my life in Japan. I believe that everything I learn in Japan will lead to the development of medical technology and culture in my home country.



**NIVA STHAPIT (From Nepal)**

Integrated Graduate School—Doctor's Course (1st Year)  
Environmental and Social System Science Course

During my bachelor's thesis, I discovered my passion for microbiology and thankfully I was suggested by a close family friend and mentor who also graduated from the University of Yamanashi to pursue my master's and doctoral studies on

water microbiology here. This was a massive opportunity for me because not only was I able to learn so much about the microbiology of different types of water and its applications, but I was also able to learn about a wide variety of other disciplines relating to water. The Interdisciplinary Center for River Basin Environment (ICRE) really widened my horizon on the issues surrounding water and has given me more perspective on this world, particularly in developing countries since that has been our primary target. In addition to this, having come to the University of Yamanashi has also given me the chance to be mentored by some of the most inspiring and encouraging professors and researchers, whose footsteps I aspire to follow, to learn and conduct experiments using excellent facilities for our research, and several opportunities to network with fellow researchers in our field. Besides research, I have also learned a great deal about Japan and their cultures and this university does an excellent job in providing international students with opportunities to learn more about Japan. I have also participated in G-Philos as a student assistant for 2 years now and communicating with young Japanese students has allowed me to understand the youth and trends as well as the cultures in Japan. All in all, my experiences here as a researcher and a foreigner have been quite enjoyable.



**YANG LI (From China)**

Integrated Graduate School—Master's Course (2nd Year)  
Life and Environmental Sciences-Bioscience Course

I joined an international program near the end of my last undergraduate term by a lucky coincidence and had my first visit to the University of Yamanashi. It was during the campus tour that I got to know the Advanced Biotechnology Center (ABC), whose micromanipulator array ranks among the largest in the world. Fascinated by the distinctive research and highly specialized equipment, I decided to further my education there

and the professor who kindly showed me around then became my supervisor. Thanks to my tutor and other lab members, I didn't have much trouble adjusting to the new environment even though I was the only international student in my major at that time. Whenever I look back on those earlier days I always feel grateful that they borrowed text books for me, gave me hand drawn notes, correct my manuscripts and bore my stumbling Japanese with great patience. Life in my lab is challenging yet exciting: Getting the technical know-how in the field of reproductive biotechnology is demanding but performing experiments using samples preserved in the International Space Station for years is fascinating. Beyond that, professor's one-of-a-kind ideas and breadth of knowledge always blow me away. Enthusiasm for research is infectious too. Lively discussions in our journal club help me practice my critical thinking skills and also improve my presentation abilities. We also have plenty of opportunities to attend lectures delivered by frontier researchers and participate in research meetings as well, which help us to make sense of the latest research findings and needs in clinical practice. Being a resident assistant has been another wonderful experience. I am inspired by those lovely, interesting and talented residents from all over the world and I always feel like they support me more although I am supposed to be the one to help out. Furthering my education at the Advanced Biotechnology Center in the University of Yamanashi was one of the best decisions I've ever made. I am ready to embrace my continuing journey of self-development here.



**NAZRUL ANWAR RAMLI (From Malaysia)**

Integrated Graduate School—Doctor's Course (3rd Year)  
Natural, Biotic and Social Environment Engineering

It has been my dream since I was a curious child aged 5 to set my foot on this "Land of Rising Sun" to experience the advancement of technologies and the abundance of cultures that Japan has to offer. I have been pulling myself up by my bootstraps to find the best pathway to bring myself to this level and more. I enrolled in a preparation course by the Government of Malaysia's "Look East Policy" program founded by its 4th Prime Minister before furthering my degree in Japan. I initially could not decide on which course to pursue but after

considering my passion for Gundam animation, I was determined to matriculate in Robotics. Through various research and inquiries, I believed University of Yamanashi (UY) could offer me the best opportunity to have my dream come to fruition. I then enrolled in Mechatronics degree course. The moment that I admitted into UY, I began a new journey full of unknowns and uncertainties. Years in, I'm convinced UY was the best choice made for I realize what a privileged position that I occupy today as a student of the University of Yamanashi. Through activities provided by the university's Office of International Affairs (OIA), I was able to get myself involved and interact directly with locals. This experience helped me to understand their culture better and improve my understanding towards people with diverse backgrounds. Such activities are organized by G-Philos, a society established by the OIA aiming to bring unity among the university's foreign students. That's the fun part; in UY, different religion, race and nationality does not matter. We, the students, all learnt from one another. I have to also highlight the endless efforts made by the lecturers and the university to ensure that the services provided to the students are aligned to internationally accepted quality standards. Life is not all cakes and ale. Countless sleepless night, the language barriers, the anxious feeling, the heartbreak and cramming at the last moment made me a much better person. I have seen it all now and have had my motivation boosted. My dreams rarely get smaller. I believe, it's never too late for a first time. I thank everyone who crossed path with me for the experiences gained, skills learnt and memories created.



# International Education & Exchange

## Center for International Education and Exchange

The Center for International Education and Exchange offers international students a wealth of guidance and consultation services, including Japanese-language education, study support, and assistance with living-related matters, and also oversees educational research-related efforts that aim to promote study abroad programs, internationalize the University of Yamanashi, and develop global human resources. The Center uses placement testing to assign students to Japanese courses, which provide the Japanese language skills that learners need to thrive as university students. The Center also provides supplementary Japanese night classes for graduate students and international researchers who spend their days focusing on research, experiments, and other responsibilities. For undergraduates, the Center offers Japan-related courses that help students develop a deeper understanding of Japanese culture and society and other courses that focus on improving intercultural communication skills. At the Consultation Room for International Students, faculty consultants and a staff member help international students with various day-to-day issues. The Center serves students looking to study abroad, as well. By providing information on exchange programs with inter-university exchange partner universities and intensive training programs on the languages and cultures students will be encountering overseas, the Center advises and supports students from the moment they start exploring the possibilities of studying abroad until they make their return to Japan.



## Office of International Affairs

The Office of International Affairs provides international students with a broad range of support, making it easier for them to concentrate on their studies and get the most out of their time as University of Yamanashi students. From scholarships, visa applications, and status of residence renewals, housing for international students, exchange (study abroad) programs, coursework, to day-to-day matters, students can contact the Office of International Affairs about anything they might need assistance with. We at the Office of International Affairs are here to help international students communicate well with Japanese people (other students and members of the local community), learn about the culture and customs of Japan, and enrich their daily lives.

## Study abroad programs

The University of Yamanashi has student-exchange programs with 11 partner universities in Asia, Oceania, North America, and Europe. In addition to half-year and year-long exchange programs, the University of Yamanashi also offers 7 different types of Language and Culture Training Programs lasting two to five weeks along with a mix of internship programs for students to take advantage of. As the University's lineup of programs continues to expand, the students are showing a growing interest in study abroad opportunities and overseas internships.



## Overseas internships

The University of Yamanashi's week-long overseas internships in Iowa (US), Kentucky (US), and Zhejiang (China) enable participants to get valuable firsthand experience in their areas of specialization at local government offices, schools, hospitals, companies, and more. Through the three different internship programs, students can gain a deeper appreciation of the need for globalization, understand the importance of intercultural understanding, experience the joys and challenges of working in a foreign setting, and develop stronger aspirations to flourish as global human resources.

## Short-term training programs

The University of Yamanashi also offers several short-term training programs, allowing students to enhance their understanding of Japanese language and culture and get an in-depth look at the University's unique, cutting-edge research initiatives.



## Dual degree program

Through degree-conferral agreements with Southwest Jiaotong University (China), Hangzhou Dianzi University (China) and University Malaysia Perlis (Malaysia), the University of Yamanashi offers dual degree programs at the master's and doctor's (graduate) level.

## Student life support and intercultural experiences

The University of Yamanashi, faculty members, tutors, and support volunteers work together to help international students with their needs both in and out of the classroom. The schedule of outings and events for international students runs year-round, with socials (organized by the University president), field trips, Japanese cultural experiences, homestays, home visits and more, providing students with a broad support structure and unique pathways to richer student lives.



## G-Philos: A study space for global co-creation

G-Philos is a "study space for global co-creation," a unique learning environment for international students and Japanese students to come together, mingle, and learn about each other's cultures and languages. During the lunch hour, International Student SAs (student assistants) and English Study Advisors gather at G-Philos to host an "English Café"—an event where students from countries around the world can chat in English and experience a truly international atmosphere right on campus. From browsing English-language newspapers and accessing learning materials to watching English video content, students can take their English studies to a new level with the support of English study advisors at G-Philos. The facility's offerings stretch far beyond English learning, of course; G-Philos also organizes programs where international students present about their home countries, and a variety of international-exchange events full of intercultural insights. International students can also get help with their Japanese-language studies from Japanese Support SAs, who are available at G-Philos on a daily basis.

## International workshops

In addition to sponsoring international-exchange events where participants can deepen their intercultural understanding, the University holds group workshops for University of Yamanashi students and their counterparts from abroad on a regular basis. At each workshop, participants choose issues to address, form teams with people from different countries, discuss the topics from their own perspectives, develop solution proposals, and present their ideas to the rest of the group. The international teams put each and every member in prime position to gain valuable skills, from learning how to collaborate on finding solutions with others across language barriers to honing the communication and leadership abilities so vital to success as a global human resource.



## Community involvement

International students at the University of Yamanashi take part in discussions with international-exchange professionals from Yamanashi Prefecture and Kofu City, international-exchange events at local elementary and middle schools, and other activities. The University of Yamanashi International Residence Halls, which provide international students with living accommodations, also welcomes local residents to mochi-tsuki (rice cake-making), international food exchanges and other events—more examples of how the University actively connects with the surrounding community.

# Faculty Introduction and Background

~ She studied abroad in Japan, and became a faculty member at the University of Yamanashi ~



**Xiaoyang MAO**  
Assistant President on International Affairs/  
Director, Center for International Education and Exchange/  
Professor, Faculty of Engineering, Graduate Faculty of Interdisciplinary Research

I started teaching at the Faculty of Engineering in University of Yamanashi 24 years ago after having been a postdoctoral researcher at the State University of New York at Stony Brook, USA and National Institute of Advanced Industrial Science and Technology, Japan. The Computer Science and Engineering, where I teach now, was one of the first computer science departments in Japan half a century ago, helping me decide to choose this university. Our department is long-established and renowned for its education based on international-standard, rigorous computer science curriculums and many professors who have been active on the international stage. Despite of relatively small-scale, the University of Yamanashi is a comprehensive university and allows students to acquire extensive knowledge from teaching staff in various fields by its charter of "Melding Various Disciplines." The environment developed for interdisciplinary joint research is the best thing I have witnessed in my time at the university as a professor. With the motto of "the core of the community and professionals of the world," the University of Yamanashi, as the knowledge base of the community, aims to foster individuals with specialized skills who can be successful in global society. Various needs of the community have formed the inspiration for many of my researches. I am specialized in image processing, which has shown further expansion in concert with artificial intelligence (AI) and especially deep learning technology in recent years. With many international students in my laboratory, diverse cultural backgrounds give us enriched inspiration to one another, contributing to stimulating joint studies. I'd like to give examples of interdisciplinary research and community-rooted research below.

## 1. Engineering-medicine joint research: Computational glasses

Humans receive information from the outside world by the five senses, of which roughly 90% is perceived through eyes. Damage to the visual system can actually hinder daily life. Color vision defective individuals have the decreased ability to perceive important information, such as the traffic signals, causing dangerous situations frequently. A number of individuals develop eye disease as they reach an advanced age, such as visual field loss caused by glaucoma or stroke and distorted vision associated with age-related degeneration of macula in the center of the retina.

Therefore, I have been developing Augmented Reality (AR) technologies combined with image processing since 2017 as a five-year JSPS Grant-in-Aid for Scientific Research (A) project. The purpose of the project is to support vision impaired individuals using an Optical See-Through Head Mounted Display (OST-HMD). In the JSPS Grant-in-Aid for Challenging Research (Pioneering) project started in 2019, I have also been engaged in development of a display technology that is capable of correcting the distorted view of a patient with metamorphopsia. I named a series of technologies developed in these researches "computational glasses."

Research for assisting those with color vision deficiency makes it possible for patients to recognize an indistinguishable object by overlaying a compensating image on the OST-HMD. The study is carried out with Mr. ZHU Zhenyang, a student from China who is in the second year of the doctoral program and has been granted JSPS DC2 Fellowship. Mr. ZHU intends to pursue research and education position in Japan after receiving doctorate.



## 2. Cooperation with the local community: AI & AR grape thinning assistance

Blessed with Japan's longest duration of sunshine, Yamanashi Prefecture is dubbed the Kingdom of Fruits and as its staple boasts grapes with the largest growing area and production in Japan. "Grape thinning" is one of the most important tasks in grape cultivation, which removes unnecessary grape berries to ensure the quality of the products. The number of grape berries after thinning depends on cultivars. Even skilled grape growers find it is difficult to work efficiently over a short period of time.

In cooperation with the farmers in the community, I am advancing my research to preserve skills with AI technology and assist grape thinning with AR. The latest deep learning technology enables a computer to learn skills and technical know-how from videos of thinning by experienced grape farmers, and analyze the condition of target grape clusters in real time during assistance. Inexperienced people can perform correct and efficient grape thinning by following instructions provided through the OST-HMD.

This research has been done with Mr. BUYAI Prawit, a student from Thailand who is in the second year of the doctoral program. Having refined on the newest deep learning model, we succeeded in automatically detecting the working grape bunches at any vineyard and estimating the number of berries in the whole bunch from 2D images. A patent application has been filed for the technology. In Thailand agriculture is a key industry that supports the economy and smart farming is in great demand. Mr. Prawit always talks about utilizing the latest AI and AR technologies that he has acquired in my laboratory for the development of his home country with enthusiasm.



# ORGANIZATION

		Classification			
Faculties	Faculty of Education	Division of School Education			
	Faculty of Medicine	School of Medicine			
		School of Nursing			
	Faculty of Engineering	Department of Mechanical Engineering			
		Department of Mechatronics			
		Department of Electrical and Electronic Engineering			
		Department of Computer Science and Engineering			
		Department of Civil and Environmental Engineering			
		Department of Applied Chemistry			
		Department of Science for Advanced Materials			
	Faculty of Life and Environmental Sciences	Department of Biotechnology			
		Department of Local Produce and Food Sciences			
		Department of Environmental Sciences			
Department of Regional Social Management					
Graduate Schools and One-Year Advanced Program	Graduate School of Education Master of Education's Course		Advanced Studies on Transforming Educational Practice		
	Integrated Graduate School of Medicine, Engineering, and Agricultural Sciences	Master's Course	Department of Biomedical Science		
			Department of Nursing Science		
			Department of Engineering	Mechanical Engineering Course	
				Electrical and Electronic Engineering Course	
				Computer Science and Engineering Course	
				Mechatronics Course	
				Civil and Environmental Engineering Course	
				Applied Chemistry Course	
				Advanced Material Science Course	
				Special Educational Program on River Basin Environmental Science	
				Special Educational Program for Green Energy Conversion Science and Technology	
				Department of Life and Environmental sciences	Bioscience Course
Food and Wine Science Course					
Regional Environment Management Course					
Doctor's Course (4Year's)		Department of Medicine			
Doctor's Course (3Year's)	Department of Nursing and Health Science				
	Department of Engineering	System Integration Engineering Course			
		Energy Materials Science Course			
		Environmental and Social System Science Course			
	Department of Integrated Applied Life Science	Agricultural Science Course			
Biomedical Science Course					
Bioengineering Course					
Special Advanced Program in Special Support Education		Education for Children with Disabilities			