

JAIIST NEWSLETTER

No.1 2020

Summer Edition

www.jaist.ac.jp

Welcome to the first edition of JAIST Newsletter. We are pleased to give you a glance, as well as the latest news from JAIST. This newsletter is set to be published 4 times in a year, which means we get to see you in Spring, Summer, Autumn and Winter.

Working on the newsletter has been an interesting experience for us, as it compels us to delve deeper into JAIST rich history and advanced academic atmosphere. We also get to share our experience of pursuing knowledge using online means during the current unfortunate circumstance. In the end, we hope everyone can enjoy the first edition as much as we do, and see you in the next edition!

Cheers!

JAIST Newsletter Editorial team

JAPAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY

JAIST is a research university for advanced sciences, and currently has four schools: School of Knowledge Science, School of Information Science, School of Materials Science and Division of Transdisciplinary Sciences respectively. The four schools consist of nine research areas: Human Life Design, Knowledge Management, Security and Networks, Intelligent Robotics, Entertainment Technology, Materials Chemistry, Applied Physics, and Bioscience and Biotechnology.

FIRST INDEPENDENT NATIONAL GRADUATE UNIVERSITY WITHOUT UNDERGRADUATE DIVISION.

JAIST was founded in October 1990 as the first independent national graduate school, to carry out graduate education based on research at the highest level in advanced science and technology. JAIST aims at establishing an ideal model of graduate education for Japan.

ADMISSION CRITERIA FOR PEOPLE WITH DIVERSE BACKGROUNDS

JAIST admits highly motivated students, including advanced undergraduate students (who have completed at least three years of undergraduate study), professionals, and international students, regardless of undergraduate specialization.

SYSTEMATIC GRADUATE EDUCATION

JAIST educates students through a carefully and systematically designed coursework-oriented curriculum, which gives students a solid foundation for their advanced research. This is different from the traditional Japanese style of graduate education, where students are trained mainly in their narrow research domains.

DEVELOPMENT OF HUMAN RESOURCES FOR SOCIETY

We train our students in a specialized field combined with interdisciplinary knowledge of related disciplines. Through JAIST educational program, students gain thorough understanding of fundamentals and develop problem-solving skills.

OUTSTANDING FACULTY

Our faculty members are world-class researchers. We recruit professionals with outstanding achievements at the leading edge of science and technology. They come from all over the world, from other universities, and from top industrial research and development institutions.

COLLABORATION WITH SOCIETY AND INDUSTRY

JAIST works closely with the regional community, as well as industries worldwide, by promoting collaborative research and accepting commissioned research. We use various modes of cooperation including visiting faculty chairs, endowed chairs, and laboratories operated jointly with other institutions.



JAIST Ishikawa Campus

ADMISSION

DIVISION OF ADVANCED SCIENCE AND TECHNOLOGY

JAIST looks for students who possess a strong will and a clear sense of purpose in pursuing study and research in the fields of advanced science and technology-based on Knowledge Science, Information Science and Materials Science, who are capable of expressing their own ideas logically, and who have an attitude to make efforts to produce mutual understanding through discussions. Applicants are expected to have a solid understanding of what they have studied in their undergraduate major field and to be prepared for study and research at JAIST. JAIST screens applicants by evaluating their basic knowledge, ability, and aspiration necessary for carrying out study and research at JAIST based on a short essay on their research topic after admission, an interview (including an oral presentation and an oral examination questioning about basic knowledge and their undergraduate major field), and a transcript of their undergraduate level school.

In the evaluation, JAIST emphasizes the result of the interview and uses submitted documents as reference. As for the Admission on Recommendation, applicants are exempted from the interview and screened based on submitted documents including the short essay and the recommendations.

DIVISION OF TRANSDISCIPLINARY SCIENCES

The doctoral program accepts applicants who have a strong desire to actively create new and advanced values for the development of society. In addition to utilizing the specialized knowledge

“JAIST fosters leading human resources who can pioneer a new world with their scientific and technological innovation through its world-class education and research in a rich academic environment.”

acquired in the master's program, they are expected to draw on their multifaceted reasoning skills to engage in concerted activities with others to play an active role in a global society. They will be called upon to identify and solve various complex problems through transdisciplinary sciences.

For more details: <https://www.jaist.ac.jp/>



Ishikawa Campus

HUMAN RESOURCE DEVELOPMENT AND SOCIAL CONTRIBUTION BASED ON WORLD TOP-LEVEL RESEARCH.

JAIST fosters leading human resources who can pioneer a new world with their scientific and technological innovation through its world-class education and research in a rich academic environment.

Japan Advanced Institute of Science and Technology (JAIST) will celebrate its 30th anniversary in October 2020. Since its foundation, JAIST has produced world top-level research achievements in a wide range of the fields of advanced science and technology and has developed excellent human resources.

“The Outline of Concept of Japan Advanced Institute of Science and Technology” issued in September 1990 and called “The Yellow Book” was considered as a bible for

the founding of JAIST. It set the purposes of the founding to “fostering university researchers and developing and reeducating researchers and engineers for industry” as well as “promoting advanced basic research in the fields of advanced science and technology.” This spirit has been inherited in the current principle of JAIST established on March 22, 2012: “JAIST fosters leading human resources who can pioneer a new world with their scientific and technological innovation

through its world-class education and research in a rich academic environment.”

Based on the purposes of the establishment and the current principle, JAIST, the first national graduate institute with its own campus in Japan, considers promotion of world top-level research, development of human resources through it, and contribution to society through education and research as the most important missions.

(President TERANO Minoru)

DEPARTMENTS OF JAIST

The four schools consist of nine research areas: Human Life Design, Knowledge Management, Security and Networks, Intelligent Robotics, Entertainment Technology, Materials Chemistry, Applied Physics, and Bioscience and Biotechnology.

The goal is to foster active global human resources by promoting faculty and student exchanges with leading institutes overseas and globalizing its education and research.

School of Knowledge Science focuses learning fields at the cutting edge of “knowledge creation” in the humanities,

social sciences, and natural sciences with the aim of discovering mechanisms that create, accumulate, and utilize knowledge and generating ideas on the design of our future society.

School of Information Science

is a faculty unit that including engineering, computer science, mathematics as well as general science to find the solution of important social problems using information processing. Aimed at cultivating talent who are accomplished experts of information science and future social lead-

ers.

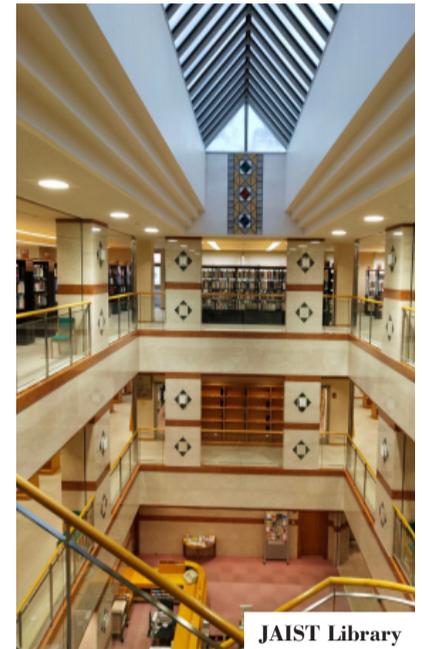
School of Materials Science is based on natural science, aiming at solving problems of human beings and society by studying and researching materials. It is expected for the students to become scientists or engineers who will show society the great possibilities of materials science, and return the results of our work to society.

The Division of Transdisciplinary Sciences

is established in 2018 with Kanazawa University consists of collaborative educational courses. The goal is to establish a new scientific

paradigm by integrating multiple disciplines while providing students with the opportunity to acquire scientific insights and the state-of-the-art technology.

In addition, JAIST has also set up advanced and user-friendly Centers for Education and Research, such as Research Center for Advanced Computing Infrastructure, Center for Nano Materials and Technology, 24-hour libraries, etc., to create a high-quality research environment for researchers.



JAIST Library



Online research facility introduction
(School of Knowledge Science)

ONLINE ACTIVITIES

As we all know, due to the sudden impact of the novel coronavirus, various countries have taken corresponding measures to prevent the spread of COVID-19, for example, strict social distances, wear masks in public places. In JAIST, lots of initiatives were taken as a measure against the spread of the epidemic, such as online open campus, lecture and seminar.

JAIST held the second “Open Campus 2020” online this year. This event is held at the university as a venue for the purpose of “experience the appeal of JAIST”. It is recorded that there were 110 applications from all over the country.

During the event, participants can freely view the university outline and introduced to online research facilities using the Web conference system, guide the university library, etc.

Also, current students through online discussions. It is held to deepen their understanding of research content and can know the atmosphere of the laboratory better.

The next online open campus

is slated to be held Friday, August 28th, and Saturday, August 29th.

We also conducted lectures online in the Term 1-1 (Ishikawa Campus) and Term I (Tokyo Satellite).

Online lectures are divided into: (1) delivery of recorded lectures and (2) simultaneous distribution using Webex.

The recorded lectures are accumulated in the lecture archiving system (JAIST-LMS), and students watch them at their convenience. As a general rule, each lecture will be delivered after the afternoon or the next morning of the lecture day.



Ishikawa Campus

HOT PAPER: SOAP BUBBLE POLLINATION

Developing soap bubbles that exhibit various biological and physicochemical properties



Image of Soap Bubble Pollination.

Introduction:

Recently, the research result of “Blowing Bubbles to Pollinate Flowers” by Associate Professor Eijiro Miyako in the field of material chemistry was published in *iScience* (Cell Press). In addition, this research result was press-released as an original technology from Cell Press and was featured in many information media such as Science, CNN, BBC, and the New York Times. The results of this research were supported by the Grant-in-Aid for Scientific Research from Japan Society for the Promotion of Science [Basic Research A, Basic Research B, International Joint Research Acceleration Fund (Strengthening International Joint Research)] and to gain an opportunity to know the atmosphere of the laboratory.

Main points:

Developed soap bubbles exhibit various biological and physicochemical properties

The soap bubbles allow effective flower pollination

A flying robot equipped with a bubble maker can be used for autonomous pollination.

More details:

Natural and artificial flower pollination are critical processes in the life cycle of flowering plants. Declines in the number of global pollinator insects, the heavy labor of conducting artificial pollination manually, and the rising cost of pollen grains are considered to be significant worldwide problems. Here we show that chemically functionalized soap bubbles exhibit effective

and convenient delivery of pollen grains to the targeted flowers thanks to their stickiness, softness, high flexibility, and enhancement of pollen activity. By exploring the physicochemical properties of functional soap bubbles, we could prepare mechanically stabilized soap bubbles capable of withstanding the windmills produced by robotic pollination. An unmanned aerial vehicle equipped with a soap bubble maker was autonomously controlled to pollinate flowers. Such technology of automatic intelligent robotic pollination with functional soft materials would lead to innovative agricultural systems that can tackle the global issues of pollination.

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