

RADIANT

RITSUMEIKAN
UNIVERSITY

Ritsumeikan University Research Report

[Special Feature]

Asia

ISSUE 1
November 2015

RADIANT

Division of Research,
Ritsumeikan University

<http://www.ritsumei.ac.jp/research/>

Photograph: Lake Suigetsu, one of the Five Lakes of Mikata
Photograph taken by Ayumu Muneno, courtesy of Tokyo Shoseki Co., Ltd.



The future is shining brightly
Ritsumeikan research activities
that enlighten the world

Future natural disasters can be seen in the varves that have recorded ancient history



Climate changes that are analogous to those of 15,000 years ago are happening in the 21st century

Some scientists argue that the earth's temperature will rise by almost 5 degrees at most over the next 100 years.

"Some say that such dramatic warming is not realistic, but it cannot be ruled out," says Takeshi Nakagawa, Director of the Research Centre for Palaeoclimatology. "Approximately 11,700 years ago, when the ice age was about to end, temperatures rose by 5 to 7°C in Greenland over the space of only a few years."

"Sometimes understanding the changes in climate that occurred in the past provides wisdom that is more beneficial for predicting future climate changes than modern climatology."

Nakagawa says. However, how can we obtain knowledge of ancient climate changes? Nakagawa is well known worldwide for having developed a highly effective timescale to enable this, i.e. using annually laminated sediments, or 'varves' in a term of geology, dug from the bottom of Lake Suigetsu, one of the Five Lakes of Mikata in Fukui Prefecture, Japan.

Every season, different type of sediment deposited at the bottom of the lake form layers in stripe patterns. Varves are like a history book of nature created over the passage of time. Lake Suigetsu does not have any large rivers flowing into it from the surrounding area. It is a deep water lake and has no living organisms at the bottom. With this set of favorable

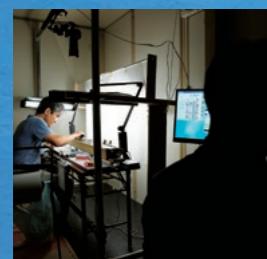
conditions, sediment accumulates without being disturbed and forms very fine varves. In a previous surveys, Nakagawa collected sediment from the bottom of the lake 95m deep, which is equivalent to about 200,000 years. In 2012, these ideal varves were adopted as the global standard for dating geological and historical relics and were ratified by the international research group, IntCal. In this way, it was recognized around the world as a timescale to identify times in the past.

Apart from the varves of Lake Suigetsu, there are a few other highly reliable timescales available, including ice core recovered from the Greenland ice sheets and stalagmites in a limestone cave in China. Over the years, Nakagawa

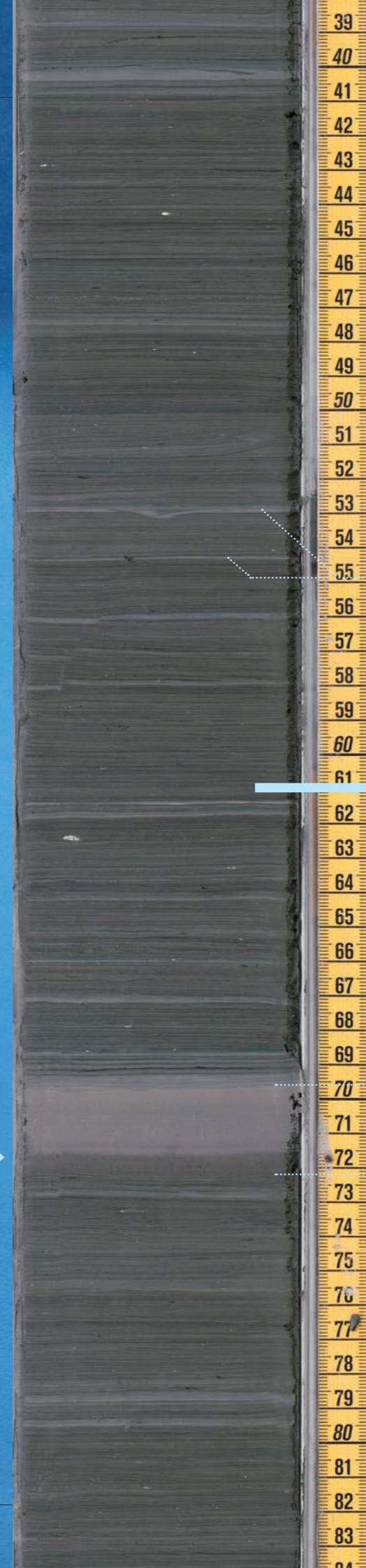
has heralded a target of "establishing a timescale comparable to that from Greenland."

"For people involved in researching the climate changes of the past, Greenland's ice core has enormous authority," Nakagawa says. "However, depending on the timescale of just one location lacks a degree of academic persuasiveness. By having a scale with a level of precision comparable to that of Greenland, we can make many more things clearer than ever."

In the case of the varves of Lake Suigetsu, the uncertainty given to the '10,000 years ago' is only ±29 years. Compared with conventional models that have uncertainties on the order of

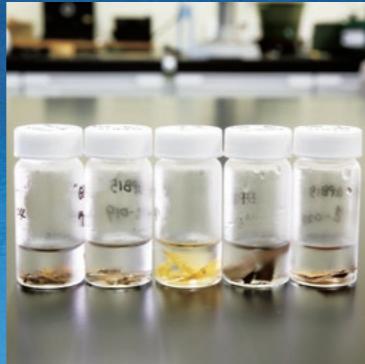


A long drill is lowered from a ship to dig at the bottom of the lake and extract sediment in a column. This is a method that was uniquely developed by Nakagawa. The sediment inside the tube is cut into two to reveal the sections of varves, by a method that was developed by Nakagawa.



Radioactive elements

Plants take in a radioactive isotope of carbon (^{14}C) contained in the atmospheric carbon dioxide, and when they die, the amount of ^{14}C contained in plant's body starts decreasing. By measuring the amount of remaining ^{14}C , the age of plant fossils can be determined.



Varve

A layer that corresponds to one calendar year is formed as a set of whitish and blackish seasonal layers. The thickness of one annual layer is 0.6 or 0.7mm. Irregular stripes represent natural disasters such as earthquakes, eruptions or flooding. By studying the radioactive carbon, pollen and many other microscopic objects included in the layer of each year in detail, researchers can obtain a wide range of information, such as ancient climate and temperature fluctuations.

Major earthquake

Pollen



Photographs: Taken by Ayumu Muneno, courtesy of Tokyo Shoseki Co., Ltd. (Page 2-3, page 4-5 spread); Kazuma Yamane (3 photographs in the top left and right center on page 4); Mitsuru Mizutani (bottom left on page 4) 5

hundreds of years, such precision is outstanding. There is little doubt that as an overwhelmingly high precision timescale, the varves of Lake Suigetsu have emphasized their importance.

Nakagawa says, "Our target is not simply to create a timescale, but to use it to elucidate the climate changes of different regions and ages."

One year's varve is only 0.6 to 0.7mm thick. Radiocarbon (^{14}C) datings were carried out to the leaf fossils included in the varves. Natural disasters such as volcanic eruptions, earthquakes or typhoons are detected by traces of volcanic ash or particular sediment compositions and structures. Past climate changes can be reconstructed from pollen fossils or sediment's chemical compositions.

Nakagawa pays attention to warming events that took place towards the end of the ice age. Analyzing the Greenland ice cores reveal that in Greenland, a

dramatic temperature rise occurred 14,700 years ago, and after a slight drop, the temperature suddenly rose again 11,650 years ago. On the contrary, according to its varves, Lake Suigetsu shows a temperature rise curve different from Greenland. Warming started about 15,000 years ago, nearly 300 years earlier than Greenland. Therefore, warming did not necessarily occur simultaneously around the world. Nakagawa's discovery has made a great impact on the world.

Furthermore, Nakagawa points out the similarities between the climate changes that occurred at the end of the ice age and the current global warming of the 21st century. "Severe flooding is now a regular event around the globe. Looking at the varves, it can be seen that the same phenomenon occurred at the end of the ice age. With additional analysis of the varves, we might be able to predict the climate changes and natural disasters that may occur in the near future."

The research techniques developed by Nakagawa and his team to collect, store and analyse varved sediments at extremely high precision was unprecedented. By utilising these techniques, other studies on varves are making considerable progress.

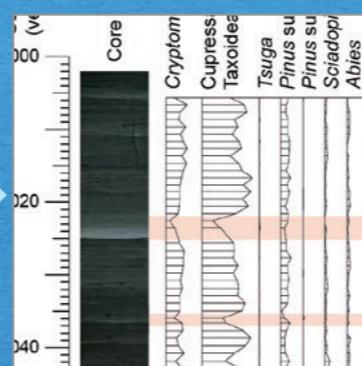
Varves are also considered to serve as a key to discovering the influence of processes in outer space on the changes in climate on the earth.

The possibility that radioactive rays with high levels of energy coming from outer space, or so-called galactic cosmic rays, could affect the earth's climate has often been a subject of discussion. By using changes of geomagnetic field over geological timescale as an experimental field, Ikuko Kitaba demonstrated their effect for the first time. Geomagnetic field, or the magnetism that the earth possesses, acts as a shield that protects the earth from the influence of cosmic rays. Analyzing pollen fossils, Kitaba found that the earth becomes colder when the geomagnetic field weakens once every several hundreds of thousands of years. The amount of cosmic rays that reach the earth has been affected by geomagnetic field, which in turn changes the amount of clouds, thereby impacting the climate.

Currently, Kitaba is trying to grasp smaller changes in geomagnetic field by using varves from Lake Suigetsu and Lake Ichi-no-megata in Akita Prefecture, Japan. "There are periods when geomagnetic field weakens in a short span of about a thousand years," Kitaba says. "My ultimate goal is to discover if the earth becomes colder even during such a short period of time."

From the past that has been asleep for tens of thousands of years at the bottom of lakes, as well as from phenomena that occurs in far outer space, these scientists took on the challenge of conducting large-scale research in order to help discover the future.

It is interesting to reveal links between phenomena taking place far away in outer space and the earth's climate through varves.



A graph (partial) showing the amounts of different types of pollen contained in individual varves. By checking the increase and decrease of the amounts of pollen, researchers can obtain data pertaining to temperature changes.



Takeshi Nakagawa

Professor, Research Organization of Science and Technology, Director of Research Centre for Palaeoclimatology
Subject of Research: Climate reconstruction using varved sediments
Research Keywords: Palaeoclimatology, Geochronology

Ikuko Kitaba

Associate Professor, Research Organization of Science and Technology
Subject of Research: Investigating mechanisms linking outer space and the earth's climate
Research Keywords: Palaeoclimatology, Cosmoclimatology

Diffusion and Changes in Culture

Pursuing Dynamic Buddhist Art



Spreading initially from India and then throughout Southeast and Central Asia, China and the Korean Peninsula, Buddhist art eventually arrived in Japan. As it expanded regionally and over time, Buddhist art combined and changed with the cultures and the values of different peoples in the regions. Retracing the footsteps of the dissemination of Buddhist art and studying the changes that took place based upon the cultures producing it makes Buddhist art history fascinating.

Takahiro Nishibayashi has found examples showing the spread of the Buddhist art of the Tang Dynasty of the seventh and eighth centuries. "Researchers have been discussing the possibility that some statues in Chang'an, the capital of Tang (present day Xi'an), and the Longmen Grottoes near Luoyang could have been designed based on the Buddha statues carried by Xuanzang from India. Some of the murals of the Mogao Caves in Dunhuang from the seventh and eighth centuries, which were greatly influenced by Chang'an, may also have been derived from the statues Xuanzang

carried back from India."

Dunhuang, described in Chinese records as the border between China and the Western Regions, had flourished since ancient times as one of the key points on the Silk Road. The city is the location of the Mogao Caves, which are famous for their Buddhist monastery caves. The earlier murals of Mogao from the fifth and sixth centuries contained some renditions of India and Central Asia, however during the latter half of seventh century and the early eighth century, the period when the Tang Dynasty was advancing into the

Western Regions, the Mogao murals came under the influence of the Chinese art of Chang'an at that time.

Nishibayashi has discovered that a certain number of Buddha figures wearing robes with their right shoulders exposed and in a pose indicating Dharmachakra Mudrā (the teaching of the wheel of dharma) were depicted in some murals in the seventh and eighth centuries at Mogao. He assumes there was a model used for these figures since they share similar characteristics in their details. He also believes that the model was from among



① Ajantā Caves, Cave 4, Seated Buddha, 5th century



② Nālandā Ruins, Seated Buddha, 9–10th century



③ Dunhuang Mogao Caves, Cave 217 South Wall, Lotus Sūtra Jingbian, early 8th century



④ Dunhuang Mogao Caves, Cave 217 West Room's Ceiling, Diamond Sūtra, early 8th century

*Both figure ③ and figure ④ include figures of Buddha modeled on the Indian statues carried back by Xuanzang at the center of each painting.

developed further. The centers of the sūtra paintings were occupied by a figure of Buddha depicted based upon the Indian statues brought back by Xuanzang. Buddhists in China produced these sūtra paintings with the purpose of eliminating their feeling of remoteness from India or for actively proclaiming their accession of Indian Buddhism.

The last 20 years have seen great advancements in the research and analysis of the Mogao Caves' murals and remarkable developments in related resources and scholarly work.

As Nishibayashi reviewing the prior scholarship, he began to doubt the theme of the mural 217 of the Mogao Caves, which was traditionally believed to illustrate the life of the Buddha. "When I carefully compared my field survey results with resources on the thematic classification of sūtra paintings, I discovered the composition of this mural coincided with the composition of a sūtra painting of a scene called Jin'gangjingbian in the Diamond Sūtra."

As Nishibayashi read this sūtra, he also found a scene where the Buddha

begged for food in a town as ascetic training, returned home, washed his feet and began a sermon. His discovery proved that the painting in Cave 217 (Figure ④) illustrated this very scene. In addition, the painting was recognized as the oldest extant depiction of the Diamond Sūtra.

Nishibayashi scrutinized Buddhist scriptures, history books, sūtra paintings and Buddha statues in order to identify what a work of art over 1,000 years old expresses. The study of Buddhist art provides the exhilaration of solving the riddles of mysteries.



Then, Nishibayashi started to focus on the Yecheng Ruins of Hebei Province. In the sixth century, Ye was the capital of Eastern Wei and of the Northern Qi dynasty that followed. In 2012, many Buddha statues were discovered in the vicinity of the Yecheng Ruins. "In the past, there were some examples of the Buddhist art of Eastern Wei and Northern Qi found in the surrounding regions, but very few were discovered in the capital. This made it difficult for us to see the entire picture," Nishibayashi says. "The 'missing link' of Buddhist art was gradually shaped through an analysis of the unearthed statues of the Yecheng capital," he says, emphasizing their importance.

Nishibayashi added that the statues from the Yecheng Ruins offered new insights into the style of Cao Zhongda, one of artists in the classical canon of Chinese painting. Cao Zhongda was a court painter of the Northern Qi dynasty. Historical records state that he was a good painter of Buddhist art and through the pursuit of creating his own techniques developed a style of depicting cloth called caoyi chushui. The Sogdian people migrated from Central Asia for the soil of Northern Qi and led the culture of Central Asia to prosperity. Cao Zhongda was also Sogdian, and he is believed to have come from northern Samarkand, in the present the Republic of Uzbekistan. However, none of the art by Cao Zhongda survives today. Therefore, there is no way to know what his real artwork looked like. Nishibayashi believes that an analysis of the Yecheng statues and the artwork of Sogdiana, (the homeland of Cao Zhongda, presently in the Republic of Uzbekistan), India and Gandhara can help us more accurately discover the techniques of Cao Zhongda.

Left Page: Nālandā Monastery Ruins (No. 3) Ruins of large Buddhist monasteries in Bihar, India. In the seventh century, Xuanzang was also a student at this monastery. This picture shows one side of one of the small towers around a pagoda at the south edge in which a Buddha statue crafted in the seventh century is placed. Xuanzang may have possibly seen this statue.

The missing link of Buddhist Art can be found in the Yecheng Ruins.

Nishibayashi also stresses the fact that many statues that depict the pensive position (seated in meditation with one leg crossed over the other) were found at the Yecheng Ruins. The seated position with the right leg crossed over the left one and the Buddha's head supported by his right hand in meditation is well-known in Japan and the Korean Peninsula, such as the Miroku Bosatsu Zo (Maitreya Bodhisattva), at Koryuji, in Kyoto, Japan. This pose initially found its way to China as a figure of the Buddha meditating. After the Northern Wei era, the statues of Eastern Wei and Northern Qi inherited similar poses. It is assumed that in the process, the pose was introduced in depictions of the Buddha of the Future (Maitreya Bodhisattva). According to Nishibayashi, in China, statues adopting this pose, which can be traced back to India and Gandhara, were predominantly discovered in the regions of the Northern Dynasty (Northern Wei, Eastern Wei and Northern Qi) that occupied the northern half of China. From the fifth to sixth century in China, there were Northern and Southern Dynasties. Traditionally, the Buddhist art that blossomed during the Asuka Period in Japan was considered to be closely related to the Buddhist art of the Southern Dynasties, transferred through the kingdoms of the Korean Peninsula, such as Paekche and Silla. "Following the development of the shapes of pensive figures enabled us to more proactively connect Japanese Buddhist culture with the Buddhist culture of the Northern Dynasty via the Korean Peninsula. The newly-discovered Buddhist art in the Yecheng Ruins has the potential to greatly advance present studies," Nishibayashi says.

The Institute of Archaeology of the Chinese Academy of Social Science (IA CASS), the leader of the excavation and research of the Yecheng Ruins, is known as the largest research institution dedicated to archaeology in China. Additionally, Nishibayashi studied there when he was conducting fieldwork as a graduate student. "It would be great for us to contribute to the recording of discovered artifacts by using Ritsumeikan's digital archive of cultural resources in the future." Nishibayashi added.



[Above Picture] Pensive statue excavated from Yecheng Ruins in 2012, with an inscription of Wuding 2 of Eastern Wei (544 A.D.)

Takahiro Nishibayashi

Associate Professor, College of Letters

Subject of Research: Oriental art history, especially Buddhist art. Focusing mainly on the art in China, and also paying attention to other Asian regions, Nishibayashi is considering the universality, regionality, meaning and role of each work of art.



The large scale flooding in Thailand in 2011 covered the land with water for more than three months, causing serious damage. The Ayutthaya remains on Ayutthaya Island, a World Heritage Site, were no exception from receiving damage.

"Though measures had been taken to prevent the flooding on Ayutthaya Island at the time, it didn't escape flood damage," Yusuke Toyoda discloses. "The reason was that there was insufficient 'risk communication' among residents and between the residents and the government."

The city of Ayutthaya, which had experienced many great floods again and again, prepared for the 2011 flood by installing a temporary soil bank at a market along the river. However, due to the fact that it reduced the space available for the market, it negatively affected business there, and shop owners banded together to oppose the soil bank and then destroyed it. Ultimately, they agreed to build new banks, but it was too late, and before the new bank could sufficiently harden, water levels in the river had risen, which resulted in the embankment being breached. The cultural heritage site was submerged in water.

"The biggest challenge to taking actions against disasters like this is the fact that, although multiple factions with conflicting positions and interests exist, in reality only one course of action can be chosen," Toyoda says. "On Ayutthaya Island, the residents, the shop owners and the government all took action individually for their own benefit, which then created

a conflict and brought about the worst possible situation." In particular, with top-down decision-making by the government, it was difficult to gain the residents' understanding. "That is the reason that 'risk communication' is indispensable for disaster management in local communities," Toyoda adds. It means that individual entities discuss risks through communication and then form agreements about appropriate responses to the risks. With agreements, the measures to avoid or mitigate risks will provide an ability to take action.

As a good means of promoting this risk communication, Toyoda has presented his Gaming Simulation. Toyoda uses the Gaming Simulation for the development of a study tool in order to experience disasters in a virtual world and safely learn lessons from disasters. Currently, he is taking on the challenge of building a new Gaming Simulation using the 2011 Ayutthaya flood as base material.

Toyoda first conducted a survey on Ayutthaya Island in order to understand the situation at the time of the flood and estimated the economic losses each entity had to bear. He then extracted and modeled the necessary elements from the survey results and organized them in the form of a game.

The game Toyoda is developing features a mechanism to obtain the "lessons learned" and "realizations" from among the results of the judgments and actions made through the communication among the players. The game is designed to not

only simulate the actions of multiple players, but to also simulate the communications and interactions among the players that will affect the processes and results of the disaster response taking place in the virtual world. For example, a player (who plays the role of a shop owner) and another player (who plays the role of the mayor) have discussions, mutually understanding their ideas and the risks, and then take actions for disaster management in order to escape the flooding. Or, if the negotiations break down, they will not take actions against the disaster, which then results in flooding and severe damage. In the game, players play different scenarios and finally look back at what judgments and actions they should have taken.

In addition to the fact that one can 'experience' mistakes not allowed in the real world, the game is advantageous in the sense that one can play a role in the game that is different from reality, one can understand the reasons for the judgments and actions taken by other parties," Toyoda says. When shop owners play the role of the mayor, they are able to understand why the mayor had decided to destroy a part of the market to build a bank. "In the game, mutual understanding among the residents and between the residents and government is promoted, while residents start to consider disaster management in their community on their own," Toyoda adds. "I believe this will lead to an improvement in the ability to respond to disasters more so than passive participation in regular

disaster mitigation drills would."

It is only natural that when a disaster occurs the priority given to cultural assets will be lower than that given to humans. What makes a breakthrough is nothing but the residents' voluntary awareness and action. The Gaming Simulation under development using Ayutthaya Island as base subject will become applicable to Kyoto, which similarly has numerous World Heritages Sites, and also for other cities around the world.

Toyoda has also contributed to the study of the conflicts and development of the developing world. "Common to disaster management, conflicts and development is the point that the sharing of thoughts and the creation of harmony via communication between the people in local communities and the government has a very important meaning," Toyoda says. "Our study of Ayutthaya Island is all connected to this."

Yusuke Toyoda

Associate Professor, College of Policy Science

Subject of Research: Developing a Decision-Making Methodology for Finding Acceptable Solutions against Disaster by Local Residents

Research Keywords: Social systems engineering, Natural disaster / Disaster prevention science, Social psychology, Experimental psychology



Gaming Simulation for visualizing decision making at the time of a disaster



Experiencing a disaster in a virtual world can change the reality of disaster management



[Top photograph] Gaming Simulation played at a Thailand university and in local communities. Raising the awareness of residents will be the best prescription to improve the ability to respond to a disaster.
[Bottom photographs, right and left] On the riverside of Ayutthaya, the World Heritage Site, there are "foldable" banks. In consideration of the landscape, the embankment is only raised during the rainy season (right photograph).

Learn the partnership between people and nature from salamanders.

Salamanders secretly live deep in forests. They are no longer than 20cm, have four legs and a long tail and are covered with mucus. This amphibian has a somewhat humorous and cheerful appearance, yet it is extremely difficult for even experts to catch sight of them in nature. They are most often seen gathering at waterfronts to spawn during the breeding season, however very little is known of their lifestyle at any other time, including where they live and what they eat. About 20 species of salamander have been discovered in Japan and there are 500 throughout the world, although it is still uncertain exactly how many species there are. Yukihiko Kohmatsu is trying to put the ecology of salamanders into focus and discover the things that are not known about them.

"It is important to first elucidate the feeding habits of salamanders." Understanding their feeding habits would help to answer many questions, including those regarding their habitat, trophic position in the ecosystem and behavior, such as their seasonal migration. However, knowing what salamanders eat in nature is not as easy as one might think. Individual salamander bodies are hard to find, and all are classified as endangered species. So, even if you do catch one, they cannot be dissected in order to easily check their stomach contents.

Kohmatsu is trying to develop a new analysis method for studying salamander feeding habits. His new method would include an analysis of the body's mucus in order to measure a stable isotope ratio of the carbon and nitrogen present in the mucus so as to identify the salamander's feeding habits. This stable isotope analysis is well known as a method for analyzing a food web. Previous studies have reported stable isotope analyses of fish mucus, but there is no precedence for the analyses of a salamander mucus.

The bio-elements in living bodies, such as carbon, nitrogen and hydrogen, are divided

into stable isotopes that have different mass numbers. In the food chain, plants are eaten by small animals, which are then eaten by larger animals, which then again are eaten by even larger ones. At this point, the carbon and nitrogen of the eaten body are assimilated by the predator. Isotopes of a higher mass number are more likely to remain condensed in the body of predator. By measuring the ratio of stable isotopes whose concentration rates are fixed, it is possible to estimate the trophic level of the animal in the food chain and the origin of the food chain. "So to speak, it is in order to follow the traces of a material circulation in ecosystem," Kohmatsu comments. He also believes that radiocarbon used dating method provide important clues.

"When applying a stable isotope analysis to an unknown sample of salamander mucus, what must be clear at first is the discrimination factor for carbon and nitrogen," Kohmatsu says. He is using the nine species of salamander endemic in Japan, which are reared by the Kyoto

Aquarium, to calculate the discrimination factors. This experiment begins with the breeding of crickets fed only rice bran. The crickets with a certain origin in the food chain will be fed to the salamanders. As the isotopes have assimilated substantially in their bodies, Kohmatsu collects the mucus to measure the ratio and derive the discrimination factors.

"When we are able to establish this methodology, I'd like to analyze the mucus of wild salamanders all over Japan in order to survey their feeding habits," Kohmatsu hopes. "Furthermore, I would like to analyze the salamanders of the Great Smoky Mountains National Park in the east of the North America, which is considered the salamander capital of the world, and to compare them with those in Japan." Unlike Japan, where the 20 species live in a wide range from north to south, the National Park has a limited habitat containing about 30 species of salamander. "What will we learn if we compare different community of salamanders with a different species diversity and the environment? I'm excited about finding out."

Research on the ecology of salamanders is not only to discover the unknown of this organisms. Kohmatsu connects the study of the adaptation of living organisms to environmental disturbance with the relationship between humans and their environment. "Human beings have controlled nature in order to protect their lives and livelihood from fury of nature and climate changes," Kohmatsu says, "as I look at the frequent occurrence of disasters, such as earthquakes and floods, these days, I can't help but consider the limitations of disaster prevention through controlling nature." Kohmatsu's research casts a question. "Salamanders survive to this day by adapting themselves to the dynamic variations of the water environment. How should we human beings adapt ourselves to disturbances in nature? We should now learn from the salamanders."

First step of unveiling the mystery of life

Yukihiko Kohmatsu

Senior Researcher, Ritsumeikan Global Innovation Research Organization



Subject of Research: Interaction of ecological function and natural disturbance in salamanders
Research Keywords: Environmental dynamic analysis, Environmental impact assessment, Environmental and ecological symbiosis, Geography, Evolutionary biology

Motorcycles are widely used as a means of transportation in many cities in Southeast Asia. At junctions in these cities, a vast number of motorcycles rush ahead, almost as if they are swallowing up the automobiles on the road. In recent years, automobiles have become more common, and this now poses a serious threat in terms of both safety and efficiency in transportation. Additionally, worsening environments caused by air pollution are not something that can be ignored. Can chaotic traffic in Southeast Asia be controlled in order to create a safe and efficient traffic environment? Yasuhiro Shiomi tackles this difficult issue.

One of the main reasons for the traffic congestion and frequent road accidents in Southeast Asia is the introduction of road and junction configuration from more advanced countries that are based on a design assuming primarily passenger cars. "Transportation systems that do not consider the fact that there are a great many two-wheel vehicles on the road are malfunctioning. In order to solve this problem, it is necessary to first establish a method to properly forecast traffic dynamics in consideration of the characteristics of two-wheel vehicles," Shiomi says. He introduces an interesting model to explain the behavioral features of motorcycles and passenger cars when they are mixed together in traffic.

"We assumed that a vehicle selects its destination from 15 alternatives of discrete space in the directions of turning left, right or going straight, and we developed a simulation model to assume the destination of each vehicle 0.5 seconds after a certain moment. This model has revealed an asymmetrical characteristic that, while passenger cars run at their own pace without paying undue attention to the motorcycles around them, two-wheel vehicles tend to travel dexterously trying to avoid cars. Considering this situation, we were able to vaguely grasp how motorcycles and passenger cars manage to move in a congested situation."

It is also an important challenge to mechanically identify passenger cars and motorcycles and understand traffic conditions in real-time in order to improve transportation situations in Southeast Asia.

Since the sensors that should be installed on roads are not deployed sufficiently, traffic conditions cannot be fully understood. However, even with the use of sensors, as in advanced countries, it is difficult to identify motorcycles when mixed in traffic in such large numbers. Shiomi thus devised a method using a new tool. His idea was to identify vehicle types by collecting GPS information and acceleration data from the smartphones of drivers of four and two-wheel vehicles.

In the city of Kota Makassar in Indonesia, passenger cars and motorcycles equipped with a smartphone were tested, and Shiomi obtained multiple run data for each vehicle. Depending on where the smartphone was placed, the device can be affected by the vibration of the engine, so to eliminate any potential discrepancies, while each smartphone was attached to the dashboard of the car, Shiomi used four methods for two-wheel vehicles: attached to the handlebars, placed in a trousers pocket, hung from the neck with a neck strap or attached to the chest with tape.

For motorcycles with smartphones fixed with an attachment, vibration from the engine is amplified by the handlebars and shows a resultant acceleration within a specific fluctuation range, making it easy to identify these motorcycles. However, the difference between other motorcycles and passenger cars could not be as clearly identified by resultant acceleration. Shiomi thus paid additional attention to the power spectral density of resultant acceleration. He was able to successfully identify motorcycles of all smartphone patterns and passenger cars with high accuracy by distinguishing four-wheel vehicles, two-wheel vehicles with an attachment and the other two-wheel vehicles based on the difference of their low frequency components.



If we can identify vehicle types in a highly accurate manner from data that can be acquired from an easily accessible tool like a smartphone, the possibilities will increase for traffic monitoring by vehicle type," Shiomi says.

Furthermore, Shiomi also discovered a method for understanding traffic conditions using the Bluetooth sensor that is built in smartphones. In Indonesia, he set up Bluetooth receivers at junctions. By counting the MAC addresses detected from the smartphones and car navigation systems near the receivers every 5 seconds, it was possible to measure the approximate speed of the traffic flow and the amount of traffic volume in a more or less. By setting these receivers, traffic congestion could be identified easily.

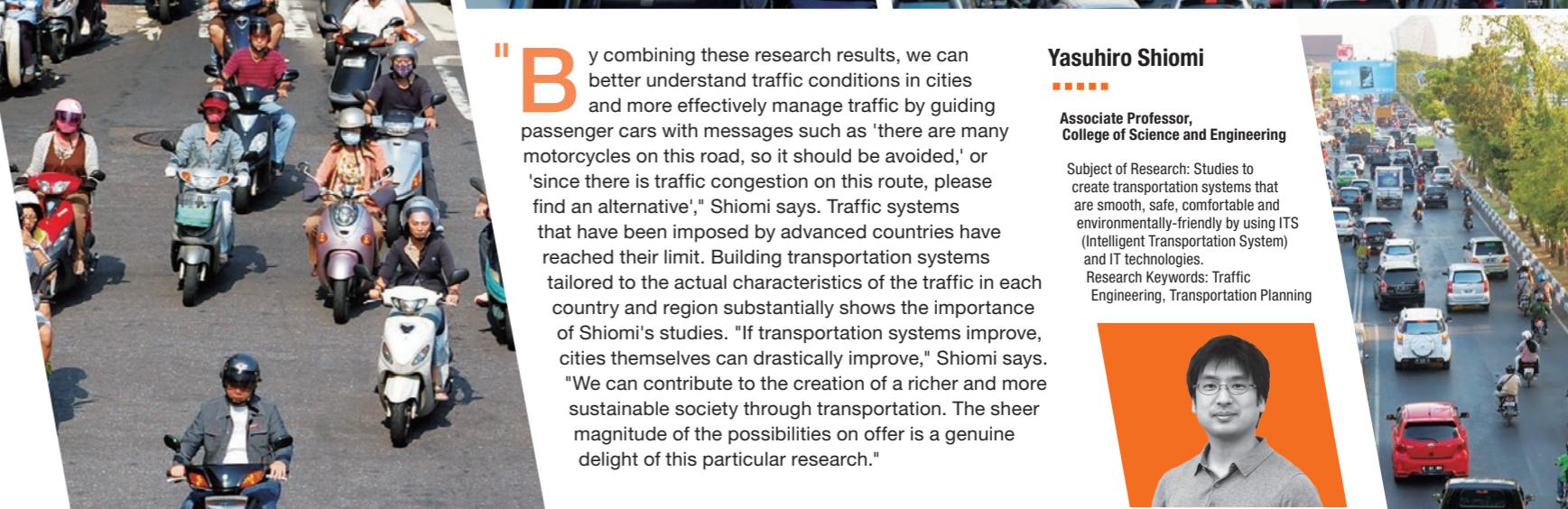


If transportation systems improve, cities may drastically improve

Yasuhiro Shiomi

Associate Professor,
College of Science and Engineering

Subject of Research: Studies to create transportation systems that are smooth, safe, comfortable and environmentally-friendly by using ITS (Intelligent Transportation System) and IT technologies.
Research Keywords: Traffic Engineering, Transportation Planning



Imposed transportation systems have now reached their limit

portation systems have now reached their limit



"To marry and have a baby. This is happiness for women."

Today, there are ever diversifying lifestyle choices, and the tendencies for people to marry later and remain single longer, and to decrease in the number of children are recognized. Even in this situation, the values related to women's feelings of happiness as stated above are still somewhat absolute and firmly established. However, having a baby is not the only kind of happiness, but it is just one form of happiness. In reality, some women fail to achieve the happiness they always assumed that they would have. Many of the women facing problems due to infertility have realized that they

could not bear children while they always assumed that they would after marriage. Suddenly, they suffer despair, feeling that their vision of a "happy life" has come down with a crash.

Yuko Yasuda strives to understand their process of recovery from this despair and the reconstruction of their lives from the viewpoint of "life-span development." What characterizes Yasuda's study is the narrative approach where she casts a unique light, on each woman's life in order to pursue distinctive and diverse stories.

Yasuda's research also includes a study that transcribes chronological flow charts of the stories of women

who could not bear children, but then adopted children. The study is based on a qualitative methodology called Trajectory Equifinality Model (TEM). This method features the illustration of multiple tracks, along with less-visible cultural and social aspects, towards a certain goal, based upon the assumption that human development and life routes are inherently diverse. It reflects the stories of the setbacks and comebacks that anyone can experience in life.

First, Yasuda lets the subjects talk about their own experiences with infertility. Listening to the stories, Yasuda carefully identifies what the

The global story of reproduction

speakers have chosen at the bifurcation points in their lives and the other possible choices they could have made and puts them into a figure with TEM. If a couple suffers from a fertility problem after marriage, they worry about whether or not to start infertility treatments. Faced with the reality of infertility, they decide to choose either to give up on having children and reconsider their lives without children, adopt a child or consider other

options. Further, Yasuda acknowledges their actions and choices while at the same time sympathizing with their emotions, that is, what the infertile women did at different times and how they felt emotionally about the consequences. "Narrating is also an action that can reposition an experience of loss, such as infertility, into the speakers own concept. "Narrating gives these women the chance to discover a new meaning from their own once-negative experiences, and the new meaning encourages them to shape their own futures. Each life story simply touches me," Yasuda says.

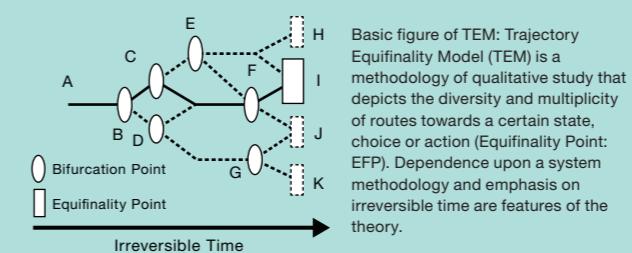
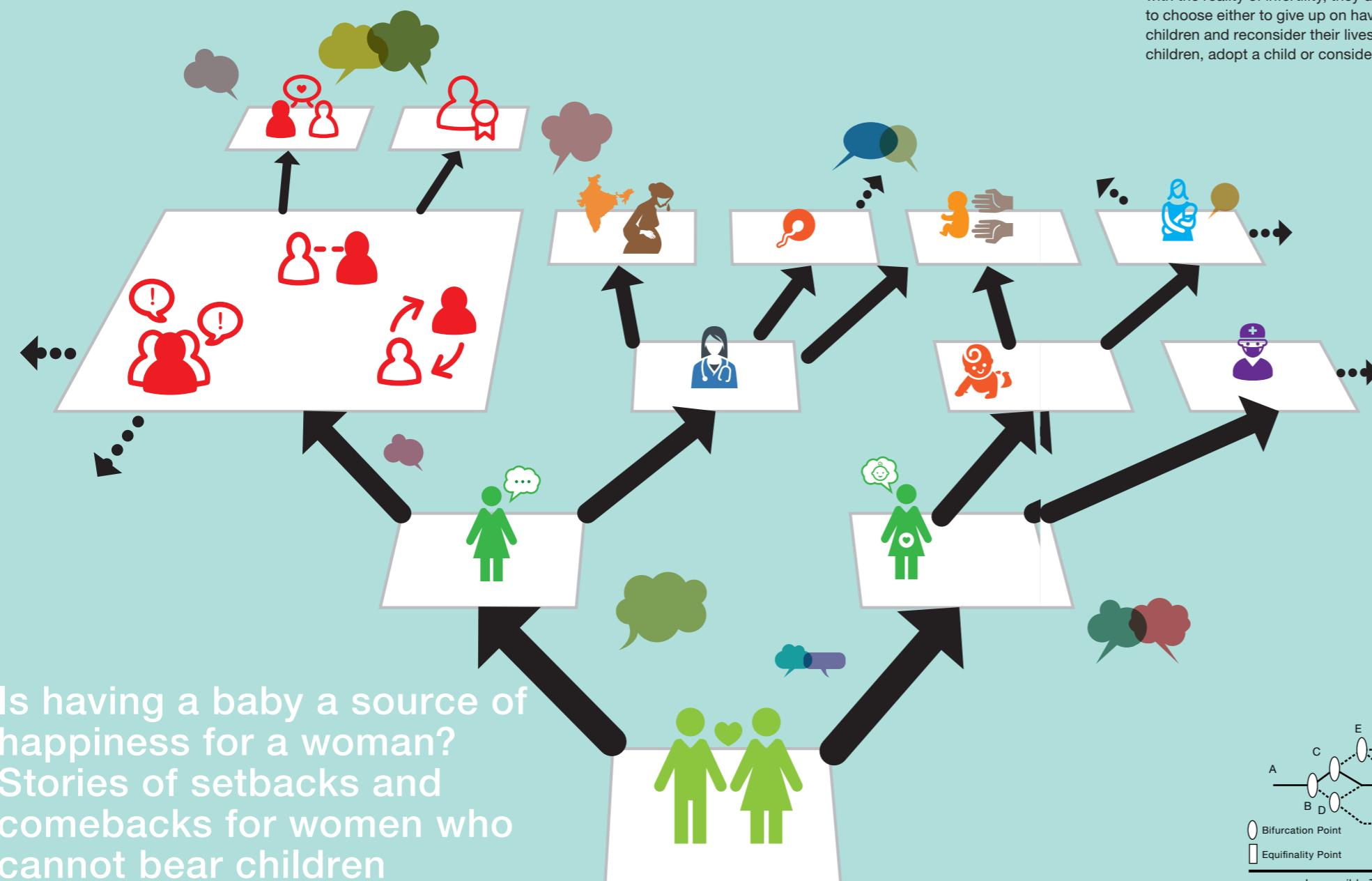
Infertility is perceived differently by those who experience it and respond to it in different ways. "Pieces of the truth about life fill each story," Yasuda considers. The narrated stories and the action of narrating not only help to heal these women's hearts, but they move many listeners with their strong message that anyone can try again in life. "What attracts me to this qualitative study is such inseparable link between human service and academic study," Yasuda says.

Today, reproductive choices and actions cannot be considered without understanding the cultural and social backgrounds involved and the influence of advancing Assisted Reproductive Technologies (ART). In particular, the development and spread of ART is complicating and diversifying the choices for women of reproduction more and more. "The development of

new treatment technologies and medical interventions for reproduction, including sperm and egg donation, create a different reality for lives that are usually created from two people and cause conflicts related to the addition of third parties. In South Korea, the donation of eggs had become a matter of public concern. In India and Thailand, surrogacy agencies had been established for the reproduction business. After the industry became regulated, it is said that there has been an increased risk of problems from illegal surrogacy."

Since these changes involve a wide variety of issues, including economic disparity, poverty and other social problems, denying their importance unilaterally indicates a lack of perspective and understanding. Considering the fact that buyers of surrogacy services are mainly people from the wealthy classes in developed countries, Japanese people should not ignore this issue. Yasuda believes that "reproduction can connect the lives of Japanese women with the lives of women in other Asian countries. To understand the stories of reproduction, a couple, a family and a life sufficiently, it's necessary to increase the knowledge of reproduction from global perspective."

Not limited to infertility, everyone lives their own bittersweet life experiences with mixed feelings. Seeing each one of the lives from the narrator perspective in order to pursue the truth of "life" is what Yasuda has had a lifelong interest in.



Yuko Yasuda
Associate Professor,
College of Letters
Subject of Research: Qualitative study of crises and recovery in life originating from reproduction
Research Keywords: Clinical psychology, life-span developmental psychology, qualitative psychology



The crisis to save the drinking water in Asia.



to secure safe drinking water. Water for purchase includes water wagons, such as tanker trucks, personally sold bottled spring or ground water and bottled water from private beverage manufacturers. The approach devised by Shimizu and his team is as follows. For purposes that do not require strict water quality or for uses apart from drinking, tap water will be used, and for drinking, bottled water will be purchased. However, bottled water will be supplied not by conventional private manufacturers or individuals, but by a water utility who will bottle highly safe water treated at a purification facility and then sell it at a lower price than general bottled water.

"The point is that without a need for large-scale facility investments, residents can have safe, low-cost drinking water. At the same time, water utilities can invest their profits from the sale of bottled water in the maintenance, management, renewal and expansion of distribution pipes and water purification facilities," Shimizu says. By doing so, safe drinking water may be supplied via conventional water supply

system in the future. Possibilities not conventionally available can be found in this "sustainable water supply system."

Is this hybrid water-supply system feasible? To confirm if it was, the field surveys had conducted in the Philippines, Laos and Vietnam. The primary contents of the field survey were interview to water utilities, questionnaire to residents, and collection of metered water consumption data.

The results of the surveys revealed that the utilization ratio of purchased water is as high as 60 to 90% in parts of the Philippines and Laos, while in Vietnam, it is as low as 1.6 to a maximum of 18%. Looking at the cost associated with water as portion of household income, it comes to about 3 to 7%, which includes water charges and water purchasing costs in these three countries. As an OECD (Organization for Economic Cooperation and Development) report says, "Expenses for water and sanitation services should be around 3 to 5%," so the former values represent what is deemed a "costly

expense" for a household.

"While business profitability should be taken into consideration, it is reasonable to reduce the price of bottled water to about half the market price and then maintain the purchasing cost of bottled water to within 3% of household income," Shimizu explains. "For low income households whose water cost exceeds 10% of their income, governments and municipalities should provide subsidies. In this way, the feasibility of an introduction will increase."

The variety of situations at water utilities, such as rainfall, historical and cultural background, geography and economic factors, are diverse depending on the country or region. Shimizu says, "It is important to propose systems that are indeed suitable for these individual characteristics."

The demand for safe water is ever increasing in the Asian region. The key is small businesses full of ideas that are not available from large-scale investments. This is where Shimizu can fully display his skills.

Turn on a water faucet, and safe and clean water comes out in an endless stream. Such a common scene in Japan, however, is rather rare in many other parts of the world. In developing countries, it certainly cannot be said that the facilities to supply safe drinking water have been introduced sufficiently. In many cases, tap water and water purification facilities are available in metropolitan areas only, and once you move away from cities, the condition of the water supply changes drastically.

"ODAs have carried out projects to develop water supply infrastructures in developing countries. Additionally, in recent years, there has been an increase in the large-scale investments in overseas infrastructure facilities by private companies," says Toshiyuki Shimizu, who is studying the stable and efficient use of

water resources in Japan and overseas. "Some people may wonder why, but it is actually difficult to continually supply safe drinking water by only improving the hardware."

First of all, even with a water supply infrastructure, the quality of the drinking water is still not at an appropriate level for drinking in some cases. Even if disinfection facilities have been installed and the quality of water has become suitable for drinking at water purification facilities,

reconstruction of pipeline system and the maintenance of aging facilities become a necessity. "In short, money and human resources are insufficient," Shimizu says. "For this reason, in developing countries, even after the introduction of water supply facilities, these facilities cannot be properly maintained or even continue to operate in many areas."

In developing countries with limited economic resources, what should be done to develop a sustainable system to supply clean and safe water? Shimizu proposes a "hybrid water-supply system" that incorporates both a "water supply via distribution pipeline" and a "drinking water supply by bottled water."

In developing countries, people boil tap water, buy home water purifier kits or simply purchase water in order



Supplying safe and delicious water to all.

Toshiyuki Shimizu

Senior Researcher,
Ritsumeikan Global Innovation
Research Organization



Subject of Research: Clarification of water usage and its' forecasting in order to develop water circulation systems
Research Keywords: Sanitary engineering, Water supply planning

RESEARCH TOPICS

Ranked 3rd for the amount of funding and 4th for the number of acceptances from Grants-in-Aid for Scientific Research (Research Fund) among private universities for three consecutive years

Allocations for AY2015 Grants-in-Aid for Scientific Research in the September 16, 2015 press release from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) ranked Ritsumeikan 3rd, following Keio University and Waseda University, among private universities (1st for private universities in West Japan) for the amount of funding and 4th (1st in private universities in West Japan) for the number of acceptances.

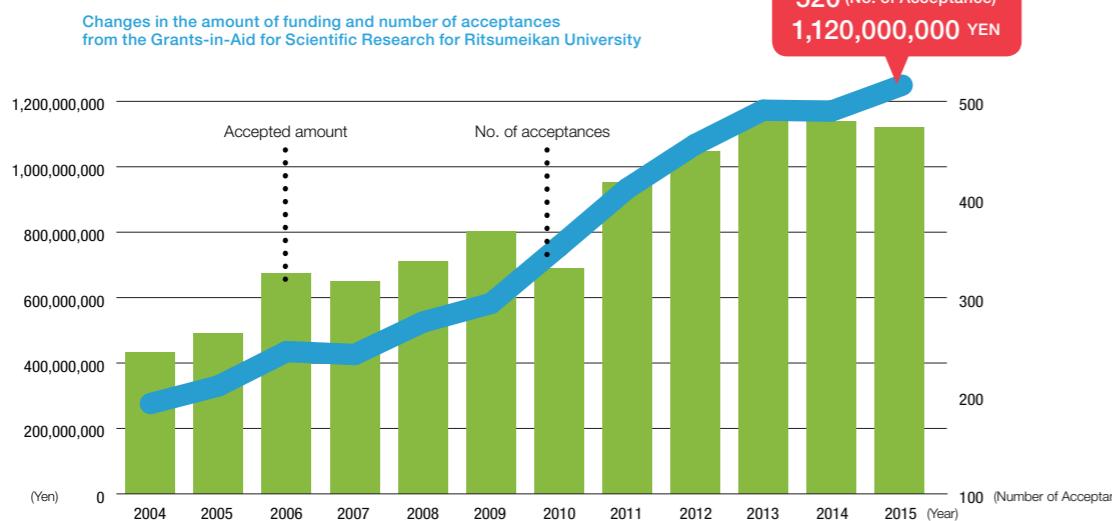
Ritsumeikan University is characterized by the fact that we are ranked

Research Funds Ranking: Research Funds Ranking:Amount	
1	Keio University
2	Waseda University
3	Ritsumeikan University
4	Nihon University
5	Juntendo University
6	Tokyo University of Science
7	Doshisha University
8	Kinki University
9	Meiji University
10	Tokai University

*AY2015 amount and no. of acceptances (new + on-going) for private universities only

Research Funds Ranking: No. of projects (selected)	
1	Keio University
2	Waseda University
3	Nihon University
4	Ritsumeikan University
5	Juntendo University
6	Kinki University
7	Tokai University
8	Tokyo University of Science
9	Doshisha University
10	Kitasato University

*Excerpt from the AY2015 Grants-in-Aid for Scientific Research press release (MEXT, Japan Society for the Promotion of Science)



*Excerpt from the AY2015 Grants-in-Aid for Scientific Research press release (MEXT, Japan Society for the Promotion of Science)

number one for the number of newly accepted projects among all universities in Japan for the disciplines of business administration and sociology, and that our new acceptances are also highly ranked for disciplines such as Separated Information Processing/Intelligent Robotic Systems, Life/Health/Medical Informatics, and Environmental Policies and Environmental Social Systems.

University ranking for no. of acceptances among the top 10 institutions (Accumulative number of new acceptances in the past five years) by research field

No.1
nationwide

2 disciplines

*Including national universities

Business Administration

Sociology

(formerly) Computer System Network

(formerly) Separated Information Processing,
Intelligent Robotic System,

Life/Health/Medical Informatics

Information Library Science/Humanistic Social
Informatics

(formerly) Environmental Impact Analysis/
Environment Policy

Geography

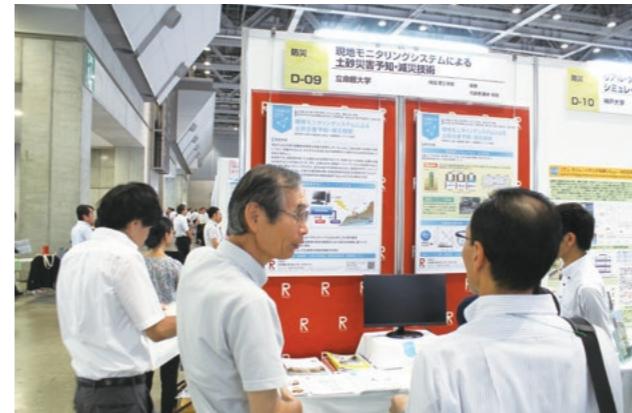
Philosophy/Ethics

Human Geography

*Titles of research fields designated as (formerly), are those that have been substantially revised in accordance with the revision of research fields of AY2013. Therefore, the number of acceptances has been calculated by adding up those between the three academic years of AY2010 to AY2012.

14 researchers, the largest number on record, exhibited at one of the largest events showcasing cooperation between industry and academia, Innovation Japan 2015

On August 27 and 28, Innovation Japan 2015 took place at Tokyo Big Sight, and 14 researchers from Ritsumeikan University, which accounted for the largest number of participants on record, exhibited their research results. Ritsumeikan University introduced cutting-edge research results, such as on light-weight, flexible inflatable robot arms using a plastic material and tamper resistant hardware security technology for vehicles. During the JST short presentations, where exhibitors at the event explain technological items for about five minutes each, seven Ritsumeikan researchers made short presentations. Over the two-day period, a total of 20,662 people visited the event.



On September 25, at the Suzaku Campus, researchers that exhibited at Innovation Japan presented their research results to members of the media.

The research results exhibited at Innovation Japan are available in video format. Please click on the below link.



YouTube Ritsumeikan Channel
<https://www.youtube.com/user/ritsumeikanu>

Ritsumeikan Global Innovation Research Organization (R-GIRO) Advisory Board Meeting held

For the purposes of further enhancing the research promotion and operational management of R-GIRO, we have been holding the Ritsumeikan Global Innovation Research Organization Advisory Board since April 2009. On October 9, on the Suzaku Campus, the 7th R-GIRO Advisory Board Meeting took place. There were reports made on the status of activities made by R-GIRO until the present, research projects officially accepted for COI STREAM (the Center of Innovation Science and Technology based Radical Innovation and Entrepreneurship Program), promoted by the Ministry of Education, Culture, Sports, Science and Technology and the Japan Science and Technology Agency, and the concepts for the R-GIRO research program for the 3rd period due to start in AY2016. We will reflect upon the warm encouragement and advice received at the event for the management of R-GIRO in the future.

Forged a basic agreement on varve-based research, etc. with Fukui Prefecture

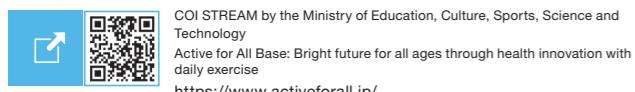
On October 22, to further deepen the research exchange between Fukui Prefecture and Ritsumeikan, based on the varves of Lake Suigetsu, the two parties forged a basic agreement on varve-based research, etc. Fukui Prefecture has a "genuine strategy for Fukui as a hometown" policy, as represented by their dinosaur studies, and part of this is seen in their preservation and utilization of the varves (sediment) of Lake Suigetsu in Fukui Prefecture. Analysis data provided by the study of varve sediment in Lake Suigetsu (worth 52,800 years), where a pivotal role has been played by Takeshi Nakagawa, Professor at the Research Organization of Science and Technology and Director of the Research Centre for Palaeoclimatology, has been adopted for IntCal13 after an agreement to incorporate the data into IntCal, an international calibration curve to convert carbon 14 years to calendar years, at the 21st International Radiocarbon Conference on July 13, 2012 at UNESCO headquarters in Paris. As a result, the varves of Lake Suigetsu have become the most precise international timescale for dating. In the future, we will work towards mutual support of academic studies of sediment varves and the transmission of our results on varve studies, targeting returning research results to Japanese and international societies.



Juntendo University and Ritsumeikan University completed an academic exchange agreement

On October 7, Juntendo University and Ritsumeikan University reached an agreement on a comprehensive educational exchange to promote the enhancement of the study and educational contents and to add to the sophistication of academia and culture.

Under COI STREAM (the Center of Innovation Science and Technology based Radical Innovation and Entrepreneurship Program), promoted by the Ministry of Education, Culture, Sports, Science and Technology and the Japan Science and Technology Agency, the two universities are now working jointly towards research to create "Active for All" programs that maintain and improve health by integrating sports and health with self-care and medicine so all people can enjoy having an active lifestyle. With this goal, and by striving to further promote the effective utilization of the educational and research resources that our two universities possess, we will accelerate our efforts to extend health and life expectancy. Dr. Eiki Kominami, President of Juntendo University, and Dr. Mikio Yoshida, President of Ritsumeikan University, attended the signing ceremony for this comprehensive agreement and finalized the agreement by firmly shaking hands.

 COI STREAM by the Ministry of Education, Culture, Sports, Science and Technology
Active for All Base: Bright future for all ages through health innovation with daily exercise
<https://www.activeforall.jp/>



Ritsumeikan University and the Strong have reached a comprehensive agreement on the historical study of video games

The Ritsumeikan Center for Game Studies (RCGS) and the Art Research Center (ARC) have reached a comprehensive agreement on the study of video game history and game conservation with the Strong National Museum of Play (Strong), an international center covering the history of electronic games and home to the World Video Game Hall of Fame in Rochester, New York.

This agreement was created for the purpose of working towards the recording, storage and study of the history of video games, which can be considered a part of world cultural heritage, by Strong's International Center for the History of Electronic Games (ICHEG), RCGS and ARC, who all share the same ideal of the conservation of video games.

 Ritsumeikan University and Strong have reached a comprehensive agreement on the historical study of video games
<http://www.rcgs.jp/2015/05/blog-post.html>



The Research Center for Pan-Pacific Civilizations and the Institute of Anthropology and History of Colombia (ICANH) have agreed to a memorandum of research exchange

On August 26, the Ritsumeikan University Research Center for Pan-Pacific Civilizations and the Institute of Anthropology and History of Colombia (ICANH) agreed to a memorandum regarding research exchange. ICANH is a public institution with a tradition of research and technology, which has a mission to study, explore, disclose and transfer the knowledge of anthropology, archaeology, history and cultural assets. It assumes an important role in leading national policies in relation to the cultural diversity of Colombia.

With the creation of this memorandum, we will further promote international joint studies between ICANH, which has the latest knowledge and information on Colombian archaeology, and the Research Center for Pan-Pacific Civilizations. At the same time, with the memorandum with ICANH, we also reached a comprehensive agreement among three universities, i.e., Los Andes University, which is considered to be the top university in Colombia, Ritsumeikan University and Ritsumeikan Asia Pacific University (APU). Going forward, we will strive to build close ties in regards to archaeology and anthropology with Los Andes University and ICANH.

Symposium held celebrating the 70th anniversary of the UN, "To Form New Partnerships: Cooperation among the UN, NGOs and Universities"

On October 18, on the Kinugasa Campus, a symposium celebrating the 70th anniversary of the United Nations took place (sponsored by R-GIRO: Research Core for Peace with Ritsumeikan Interdisciplinary Studies). Mr. Yasushi Akashi, former Under-Secretary-General of the United Nations gave a keynote address and a lecture on "The United Nations at its 70th Anniversary: Its Philosophy, Reality and Outlook." During the panel discussion that followed, the panelists held active discussions on a variety viewpoints, such as, how to take advantage of knowledge from the field for research, how to reflect field experience in education and what type of human resource development is necessary for field research.

ENEMANE House 2015 has accepted Dr. Tomoyuki Chikamoto, Professor at the College of Science and Engineering

A group led by Dr. Tomoyuki Chikamoto, Professor at the College of Science and Engineering, as project leader (Project name: Mizu to Kurashino Kasanebako) was accepted by ENEMANE House 2015, and was solicited by the general incorporated association the Sustainable Open Innovation Initiative.

Based upon the idea of showing houses of the future developed by students and using the concepts of energy, life and Asia, ENEMANE House 2015 was a project that actually built, demonstrated and exhibited model homes that use advanced technologies and new ways of living through a collaboration between universities, private companies, etc. It accepted five universities from across Japan in FY2015.

Our group added the concept of a thorough utilization of water to the existing concept of ZEH (net zero energy house) in consideration of creating a sustainable lifestyle that makes environmental symbiosis and comfort compatible through energy reductions and by proposing what houses should be like.

The houses were built in the Yokohama Minatomirai area and demonstrations and exhibitions were held. From the middle of October to early November, the houses were open to the general public, and a vote was held online resulting in Ritsumeikan University winning an Excellence Award and a Special Award (Energy and Resources Award).

 ENEMANE House 2015 official website
<https://sii.or.jp/emh2015/>

Ritsumeikan International Forum celebrated the 10th anniversary of Ritsumeikan University Graduate School of Technology Management (MOT) and the establishment of the OIC

On September 4, at the Grand Hall on the second floor of Ritsumeikan Ibaraki Future Plaza (Building B), a symposium was held to celebrate the 10th anniversary of the MOT and the establishment of the OIC (Osaka Ibaraki Campus). With the theme of a "strategy to promote the popularity of next-generation automobiles for the survival of Japan and other global trends," stakeholders were invited from around the world, and key members from industry, government and academia involved in Japanese policy making met and studied strategies to advance the popularity of next-generation automobiles for the survival of Japan.

Symposium held celebrating the opening of the Research and Development Institute of Regional Information at the OIC

On May 30, at the Grand Hall on the second floor of Ritsumeikan Ibaraki Future Plaza (Building B), a symposium was held by the Research and Development Institute of Regional Information to celebrate the opening of the OIC. The symposium was entitled, "Global Environmental Changes and Cooperation and Commitment by Local Communities: From Mutual Studies in Communities for Forming Consensus to Realizing the Future Earth." We invited researchers involved in studies on global environmental changes and discussed the roles and commitments of universities in local communities and created forums for mutual studies with citizens.

Agreeing to a memorandum on a partnership and cooperation with Hoosiers Corporation for the conservation and utilization of the Nagae Family Residence, a designated Tangible Cultural Property in Kyoto

On May 27, Ritsumeikan University agreed to a memorandum with Hoosiers Corporation (Chiyoda-ku, Tokyo) to form a partnership and cooperate towards the conservation and utilization of the Nagae Family Residence, a designated Tangible Cultural Property in Kyoto. A reporting conference was held at the Nagae Family Residence.

Through this memorandum, we have achieved an unprecedented initiative where a private business and a university, which is an educational and research institute, will work together to conserve and utilize a large Kyoto-style town house (Kyomachiya) symbolizing the history and culture of Kyoto and will be supported by public organizations, such as the Kyoto Municipal Government and the Kyoto City Landscape and Construction Center for Regional Development.

We have routinely conducted surveys and research on Kyomachiya traditional houses, Funahoko floats and the Nagae Family Residence, supporting the operation of the Nagae Family Residence with students and Yamahoko float events by the Funahoko Conservation Club. In the future, as an educational and research institute, we will contribute to the community by successfully developing a living, spatial and town making culture unique to Kyoto through the digital archiving of collections, conducting research on the living culture and other Kyoto studies, and also promote an understanding of Kyoto traditional culture and lives by university and graduate school students using Kyomachiya traditional houses.



EVENT GUIDE

Ritsumeikan University Student Venture Contest 2015 Final Screening

② November 28 (Saturday) 14:00 -
④ Conference Hall on the 1st floor of Ritsumeikan Ibaraki Future Plaza (Building B)
Ritsumeikan University Osaka Ibaraki Campus

Each of the eight teams that passed strict screening procedures will give a presentation on their business plan in front of an audience. Admission is free for both the final screening and keynote lecture. No application in advance is required. Entry or exit at any time during the event is permitted.

 Center of Innovation Program
Bright future for all ages with health innovation through daily exercise
Active for All Base Symposium 2015
"For Those who Cannot Continue to Exercise"

③ December 1 (Tuesday) 14:00 -
④ Knowledge Theater, 4th Floor, North Building, Grand Front Osaka

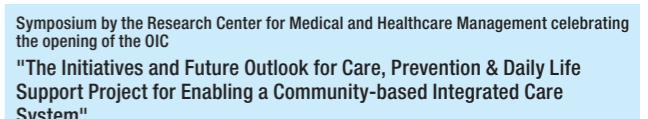
We have invited Ms. Kaori Araki, the mental coach for the Japanese team that competed in the 2015 Rugby World Cup to give a keynote address entitled, "The Resiliency to Start and Continue with Exercise." Advance application for participation is required. Please send your name, address, department, contact phone number and email address to the email below.

liaisonb@st.ritsumei.ac.jp

International Robot Exhibition 2015

② December 2 (Wednesday) - 5 (Saturday) 10:00 - 17:00
④ Tokyo Big Sight

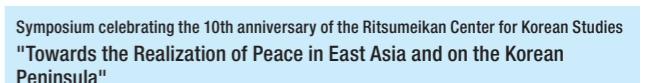
Dr. Sadao Kawamura, Professor of the College of Science and Engineering, Dr. Shinichi Hirai, Professor of the College of Science and Engineering, Dr. Sang-Ho Hyon, Associate Professor of the College of Science and Engineering will participate in this exhibition. Admission: 1,000 yen (*Free of charge for those who register in advance, those with an invitation ticket and children that are junior high school age or younger). Entry or exit at any time during the event is permitted. For further details, please access the International Robot Exhibition 2015 official website.
<http://www.nikkan.co.jp/eve/irex/index.html>

 Symposium by the Research Center for Medical and Healthcare Management celebrating the opening of the OIC
"The Initiatives and Future Outlook for Care, Prevention & Daily Life Support Project for Enabling a Community-based Integrated Care System"

③ December 6 (Sunday) 13:30 -
④ Conference Hall on the 1st floor of Ritsumeikan Ibaraki Future Plaza (Building B)
Ritsumeikan University Osaka Ibaraki Campus

Admission free, no advance application required

 Please send your name, address, department, contact phone number and email address and send your application to the following email address:
rcmhm@st.ritsumei.ac.jp

 Symposium celebrating the 10th anniversary of the Ritsumeikan Center for Korean Studies
"Towards the Realization of Peace in East Asia and on the Korean Peninsula"

② December 12 (Saturday) 10:00 - 17:30
④ Large lecture room, Suzaku Campus, Ritsumeikan University

Admission free, no advance application required

Ritsumeikan University Robotics Technology Information Meeting

③ December 18 (Friday) 12:00 - 17:00
④ Osaka Innovation Hub (7th Floor Knowledge Capital Tower C, Grand Front Osaka)

For the purpose of commercializing research results, we will sponsor a seminar in which researchers will give presentations in person on their latest research on robotics technology, which is the pride of Ritsumeikan, and introduce technologies for industry-academia collaboration. In addition to the presentations, we will exhibit posters and robots.

 Symposium celebrating the opening of the OIC, Research Center for Design Science, Ritsumeikan University
"Future of Open Innovation & Collaboration" — Feel the Challenger's Beat

③ December 18 (Friday) 14:30 -
④ Conference Hall on the 1st floor of Ritsumeikan Ibaraki Future Plaza (Building B)
Ritsumeikan University Osaka Ibaraki Campus

Admission free, no advance application required

COLUMN #1 The World of Shirakawa's Letter Science

H(sai), the beginning of Shirakawa Letter Science

Takao Sugihashi

One of the features of Ritsumeikan University is embedded in its own name, in its kanji characters. In the past, a social system and culture based on kanji (Chinese) characters existed authoritatively in East Asia. Based on the study of Dr. Shizuka Shirakawa, we'd like to introduce you some early kanji characters.

The first of the column is about "口", the starting point for Shirakawa's Letter Science. This character is embedded in some other characters, such as 名 (name), 召 (summon), 史 (history) and 事 (affair). However, its presence in these other characters cannot be explained related their meanings if one considers only the current meaning of "口" of "mouth". The original form of "口" is "匚". Dr. Shirakawa interprets it as a bowl that contains felicitations to the gods. Because "匚" was used to mean "to do" in fortune-telling inscriptions on bones and tortoise carapaces, the character was named "sai" (to do). This character is also the logo of the Shirakawa Shizuka Institute of East Asian Characters and Culture.

This discovery, derived from an investigation into the religious and shamanic societies behind the initial development of kanji characters, has clarified the origins of many kanji characters and groups of characters and has thus contributed greatly to research in the places where kanji characters are used.

Since the character "口" came to have the meaning "mouth," the next problem was to investigate the process of the meaning change and the relationship between "sai" (to do) and "mouth."

**The Shirakawa Shizuka Institute of East Asian Characters and Culture**

Based on the high level accomplishments of the research on Far Eastern characters and cultures by the late Shizuka Shirakawa, Cultural Merit Award recipient and professor emeritus at Ritsumeikan University, this institute aims to educate and spread awareness to the general public on Far Eastern characters and cultures and help progress and improve the academic research on these cultures. We sincerely hope that our activities may contribute to peace and development in the East Asian region. URL: <http://www.ritsumei.ac.jp/acad/re/k-rsc/sio/index.html>

About Dr. Shizuka Shirakawa

Based on the belief that Japan and China share a cultural typology in the East Asia region, Dr. Shirakawa organized primary meanings of kanji letters based on their shapes and built a creative achievement on the ancient cultures of China and Japan. His original theories, called "Shirakawa's Letter Science," have gained a high reputation in academia both in Japan and overseas. While Dr. Shirakawa started with the study of ancient Japan, his range of research expanded into ancient China due to the necessity of comparative study, and as a result he advanced towards a great study that covered the entire kanji cultural sphere. He became a Person of Cultural Merit in November 1998 and was given the Order of Cultural Merit in November 2004.



Takao Sugihashi Doctoral Degree from the Faculty of Letters, Graduate School of Letters, Kyoto University, Doctor (Literature) in 1974. After holding the position of research assistant of the Faculty of Letters, Kyoto University, Assistant Professor in College of Letters, Ritsumeikan University in 1977. Filled the posts of guest researcher at Princeton University, Professor, Dean of College of Letters and Dean of Graduate School of Letters, Ritsumeikan University. Tokunin professor and professor emeritus in 2012. Director of the Shirakawa Shizuka Institute of East Asian Characters and Culture since 2014. Director of the Japan Ancient Document Association.

COLUMN #2 Lifestyle recipes

Sweets for athletes are here!
"SOY DELI: Kyoto Bean Fighters"

Kumiko Ebi

Do you know the glass-walled room with a kitchen and a low dining table on the 1st floor of the Experiment Building at the College of Sport and Health Science? It is the RecO Studio, a practice room for learning about nutrition and cooking that was created in cooperation with Osaka Gas. It was built in the hopes that students would learn how to handle gas and become more independent through learning to cook. However, the RecO Studio also serves as a base for many people to create interesting and new things, more so than its designation as a "practice room" would suggest.

SOY DELI: Kyoto Bean Fighters (SOY DELI) is one such item and was commercialized in July. It is an unprecedented sweet for athletes that enables the supplementation of protein in a tasty manner by using soybean powder instead of wheat flour.



For athletes, protein supplementation is one of the challenges they face. Powder types do not taste good, and their "protein-like" appearance tends to put off consumers. SOY DELI actively sought to create a delicious flavor and made more than a dozen prototypes. It has a fluffy and moist palatability, which for Japanese people is easier to eat as their quantity of saliva secretions is less than that of Western people. With just a single bar (30g), one can ingest 60 soybeans worth of protein, and it also contains a good balance of essential amino acids.

This project was proposed by a company from Kyoto. Soybeans were obtained from an established grain broker and baked using the traditional techniques of a baked sweets manufacturer who has a long traditional history. A sport beverage manufacturer headquartered in Kyoto is working hard on sales promotion. SOY DELI, the sweet for athletes, was created through the dynamic power of Kyoto, where people are known to take on the challenge of making new things while also caring about tradition.

Currently, the product is available at university CO-OP stores or the official website (<http://soydeli.jp>). In the future, it will be sold at universities affiliated with Ritsumeikan, so please make sure to try it.



SOY DELI website:
<http://soydeli.jp/>

Comment from Ryohei Miki, Coordinator in charge (Research Office at BKC)
I believe that industry-academia collaboration creates the future. This SOY DELI product is a result of bold innovations made by all involved in order to create a new value beyond the usual business categories or industries.

Kumiko Ebi Completed Doctorial Course, Second Term (Nutrition Science), Graduate School of Nutrition Science, Koshien University in 2007. Doctor of Nutrition Science. Contracted researcher, Department of Sports Medicine, Japan Institute of Sports Sciences, in 2006. Professor at the College of Sport and Health Science, Ritsumeikan University since 2010. Vice-chairperson, Japan Sports Nutrition Association. Member of the Japanese Society of Nutrition and Dietetics, Japan Society of Nutrition and Food Science, Japan Sports Association, Japanese Society of Sport Education, Japanese Society of Clinical Sports Medicine, and the Japan Association for the Integrated Study of Dietary Habits.

COLUMN #3 "Altruism" rooted in society

Towards the creation of a world where people will always have hopes and dreams

Ritsumeikan Inamori Philosophy Research Center

For the half a century since its foundation, KYOCERA Corporation, a company that has continuously made profits without accruing any deficits, has set its corporate philosophy of "what is right as a human being" as its management foundation and has heralded the "material and spiritual happiness of all employees," in particular their spiritual happiness, as their first Management Rationale and corporate target.

Professor Atsushi Aoyama of the Graduate School of Technology Management, Ritsumeikan University analyzes it as follows. "The management of KYOCERA consists of a value system based on views of happiness, work and life (the spirit of an "altruistic mind") and an elaborate management system to achieve it (amoeba management). By setting the concept of spirit as the core of management, the inner workings of employee minds are linked to the competitiveness of the company, thereby reflecting the philosophy and values onto management in order to achieve the material and spiritual happiness of the employees. (Atsushi Aoyama, "Kazuo Inamori of KYOCERA: Management System of Spirit", 2011, Nikkan Kogyo Shimbun)



Furthermore, Professor Aoyama points out that when the concept of spiritual management and the spirit of an "altruistic mind" is spread through society, more people will realize that there is a specific method for achieving their thoughts and goals. This awareness leads to a better society for all to live in when people obtain ideal happiness as human beings through confronting and overcoming their difficulties with colleagues and by enhancing both humanity and themselves in the process of dealing with problems and overcoming them.

To create a new subject for study that promotes the realization of a society where people can sustainably have hopes and dreams, making Inamori's management philosophy more universally applicable and more widely practiced, and to gather researchers in management, psychology and many other academic domains, the Ritsumeikan Inamori Philosophy Research Center was established on the Osaka Ibaraki Campus (OIC) in June 2015. Professor Aoyama himself was inaugurated as Chief Director, and Dr. Kazuo Inamori (Chairman Emeritus of KYOCERA) assumed office as Director Emeritus.

In the following issue and beyond, we will discuss what an "altruistic mind" rooted in society should be, while referring to the development of our center's research activities where appropriate.

Ritsumeikan Inamori Philosophy Research Center A research center established at the OIC in June 2015 with a goal of making the study and use of Inamori's management philosophy more universally applicable and more widely practiced from diverse academic viewpoints, such as philosophy, psychology and management. We also promote the research and development of educational programs to help people master Inamori's management philosophy.

Ritsumeikan Saturday Lecture Series

The late Dr. Hiroshi Suekawa, then the President of Ritsumeikan University, proposed that "study and science are for the sake of protecting the benefits and human rights of citizens and the general public. A university is a place to develop human beings through study, and it is important to walk, think and study along with the general public." Therefore, the Ritsumeikan Saturday Lecture Series was established to open the lectures of the university to the general public and strengthen the ties between the university and the local community. Ever since the first lecture entitled "About the Labor Union Act" by Professor Hiroshi Suekawa on March 31, 1946 during the turmoil of the postwar period, for more than half a century, this series of lectures has taken place.

Dec. Five years after the Great East Japan Earthquake, restoration and support To be connected beyond distances

December 5 No.3149
Feeling the winds of Fukushima
Fighting the rumors and potential of fading away
Tatsuya Sato, Professor, College of Letters

December 12 No.3150
Small buildings, large expansion
Miyako restoration support activities with students
Shinsaku Munemoto, Associate Professor, College of Science and Engineering

December 19 No.3151
Challenges of restoration from earthquake damage
Views from overlapping debts, compensation system for nuclear damage, etc.
Toshihiko Kubo, Professor, College of Economics

Jan. Publications and libraries in the digital age

January 9 No.3152
Utilization of information technology in electronic libraries
Akira Maeda, Professor, College of Information Science and Engineering

January 16 No.3153
From printing and publication to digital archiving
Takaaki Kaneko, Associate Professor, Kinugasa Research Organization

January 23 No.3154
Digitization of Japanese documents as seen from overseas libraries
Toshinori Egami, Head of Library Services Unit, Library Material Section, International Research Center for Japanese Studies

January 30 No.3155
New role for libraries in the age of electronic publishing
Toshihiko Yuasa Professor, College of Letters

Ritsumeikan Saturday Lecture Series website
<http://www.ritsumei.ac.jp/acad/re/k-rsc/kikou/doyokozakikoh.htm>

Admission free, no advance application required

Lecture room, Suekawa Memorial Hall, Kinugasa Campus, Ritsumeikan University

Research Organizations, Research Institutes and Research Centers

Ritsumeikan University heralds "striving to become a unique university for research that contributes to humanity, nature and society" as part of its Academy Vision of 2020 and is actively taking on the challenge to achieve this goal.

Towards receiving acceptance from the Grants-in-Aid for Scientific Research (Research Fund), where the government assists creative and pioneering research and the formation of a world-class research base, the university has established research organizations to promote research in fields

such as the humanities, social sciences and natural sciences. In 2015, the Research Organization of Open Innovation & Collaboration was established on the Osaka Ibaraki Campus.

44 research institutes and centers under individual research organizations promote a wide range of activities from the basics to applications.

These organizations are actively engaged in research exchanges with the government, municipalities and industry, thereby returning their achievements to society.

Ritsumeikan Global Innovation Research Organization (R-GIRO)

R-GIRO is a research organization under the direct control of the University President, and was established in 2008 with the goal of "forming a research hub specifically for policy-driven research topics" and "strengthening the development of young researchers who will lead the next generation." The organization's goal is to contribute to the next generation of society by producing valuable research findings and actively disseminating them through the promotion of interdisciplinary research activity which aims to integrate the natural science fields with those in the humanities and social sciences toward the realization of a symbiotic society that the 21st century demands.

In programs of the 1st stage of R-GIRO (AY2008-2011), we focused on the "realization of a society that is capable of coexisting sustainably with nature (return to the earth's nature)" and started research in the natural sciences field, followed by the addition of the humanities and social sciences fields, promoting

Ritsumeikan Global Innovation Research Organization (R-GIRO)

cross-university projects integrating humanities and science.

In 2nd stage programs (AY2012-2015), 33 projects that promoted research in 1st stage programs have been integrated into seven research bases and nine projects, developing them to be applied to society, such as in the commercialization of research results.

For 3rd stage programs, which are due to start in AY2016, while continuing with the research we have accumulated thus far, we will further narrow them down by focusing on and striving to solve themes that should be faced from global perspective and that are urgent challenges for Japan, such as its declining birthrate and aging population and environmental issues, in consideration of how to create a sustainable society where people can experience affluence and happiness in the 21st century.

Ritsumeikan Asia-Japan Research Organization

This research organization, founded in December 2015, is directly managed by the President and strives to form partnerships with Japanese and international research institutes, including Ritsumeikan Asia Pacific University (APU), to exert its role as the core of a diverse research network, drive Asian studies from global viewpoints and promote international academic communication and exchange. Additionally, not only research activities but also the results are

Ritsumeikan Asia-Japan Research Organization

Asia-Japan Research Institute

turned into educational projects, open projects or public relations projects, allowing the institute to have a capability for comprehensive Asia Pacific educational exchange and act as a base for information transmission. The institute is further expected to serve a support role as a forum to develop global human resources by, for example, offering experience to help communicate with local residents.

Asia-Japan Research Institute

On the themes of co-existence, co-creation and reconciliation, this research institute takes on a diverse range of research, including cultural and civilization studies on the culture, climate, ethnic groups, religions, etc. of East and Southeast Asia, in addition to joint studies, general studies and practical studies and a wide variety of studies regarding security and diplomatic political history of

Japan and Asia.

We accept young researchers from the Australian National University, one of the leading research universities in the world, and focus on the development of international joint studies and the global transmission of results through international joint theses, etc.

Research projects being promoted

[Co-existence] Studies on culture and civilization brought about by human awareness and historical entities based on the culture, climate, ethnic groups and religions of East and Southeast Asia

- Transition of Asian thoughts and philosophies in the global era
- Civil ethics and political thoughts in Asia
- Religions, philosophies and thoughts in Southeast Asia
- Mutual understanding of modern and classical Asian literature
- Traditional entertainment in Asia and the meaning of new "festivals" and "rituals"
- Islamic social changes, thoughts and life
- Islamic religion and arts
- Japan in Asia and Asia in Japan

[Co-creation] Joint, general and practical studies between Japan and Asia, on the basis of setting actual challenges

- Essence of management with Chinese and Japanese management styles
- Current Asia, involving natural resources
- Industrial strengths, manufacturing capabilities and educational policies in Asia
- Software power in the Asian century
- The food situation and agriculture in Asia
- Asian tourism
- Research and development in environmental and energy fields, contributing to the sustainable development of Asia
- Preventative measures against natural disasters in Asia
- Architecture in Asia

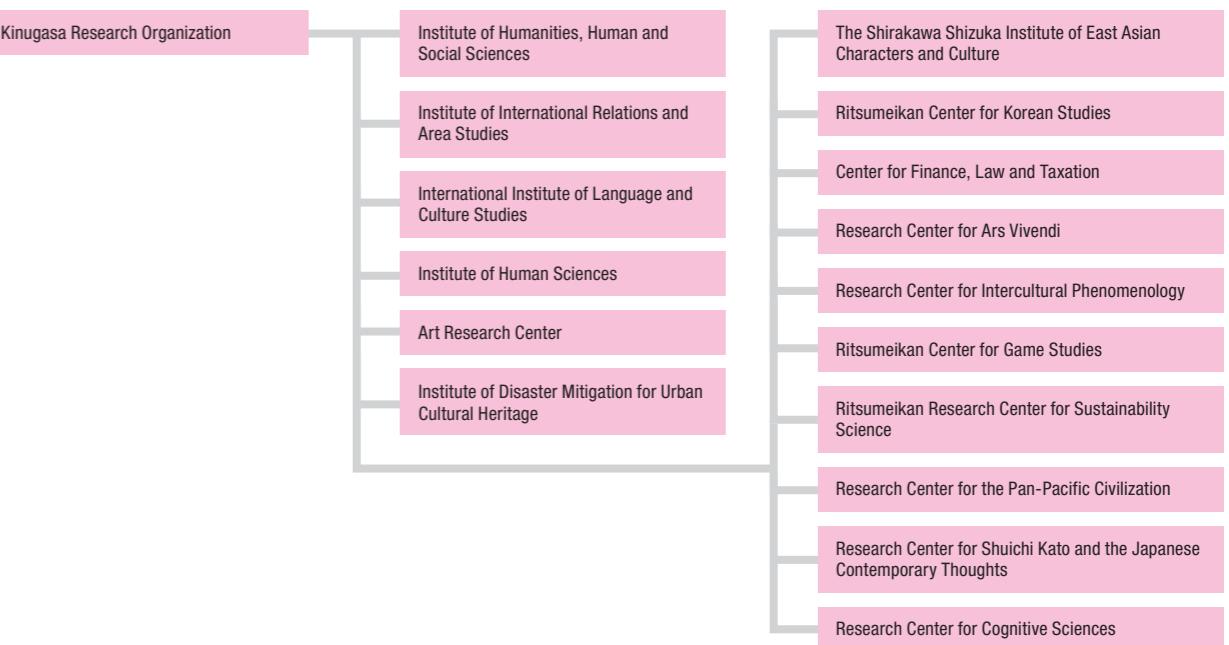
[Reconciliation] Studies on security and diplomatic politics (and their history) in East Asia, Southeast Asia, South Asia and the Islamic sphere

- Diplomatic political studies
- Discussions on the "recognition of history" in East Asia
- Studies of US diplomatic policies in Asia
- Rules and liberation in Southeast Asia: From the century of development from dictatorship to democracy
- Studies on modern history and political trends in Japan
- Studies on the history of political balance and diplomatic politics in Asia
- Studies on the Arab revolution and Middle Eastern politics
- History of relations between India and Pakistan

Kinugasa Research Organization

Kinugasa Research Organization was founded in 1998 and it supports research activity as a research organization which manages the research institutes and research centers. The organization's goal is to contribute to human welfare and social progress under the four principles of "autonomy," "democracy," "openness," and "peaceful use".

The Research Center for Shuichi Kato and the Japanese Contemporary Thoughts was established in April 2015 and the Research Center for Cognitive Sciences in October of the same year. The latter is engaged in discovering the basic processes of human cognitive activities (such as perception, thought and language) as well as applied issues within limited contexts, with a goal of establishing a cognitive science structure with a panoramic view to achieve a creative collaboration between humans and the environment, humans and humans and finally humans and machines.



Research Center for Shuichi Kato and the Japanese Contemporary Thoughts

The purpose of the activities of this research center is to study the vast number of books and posthumous writings in the Kato Shuichi Collection and to disseminate and utilize the findings from them, as well as for the development of intellectual thought internationally. At the Research Center, researchers of the history of political philosophy, the history of Japanese literature, cultural anthropology, journalism and library sciences meet to create and spread a full picture of Shuichi Kato's world of knowledge and wisdom.

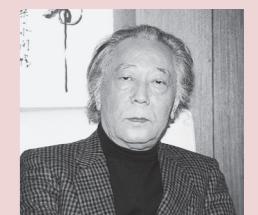


Research organization

Director: Tsutomu Washizu, Professor, Kinugasa Research Organization
Research theme: Study of intellectuals and cosmopolitanism in postwar Japan
 (1) Basic research group
 The Kato Shuichi Collection as a foundation
 (2) Research results utilization group
 Building and using the Kato Shuichi Collection digital archives

Shuichi Kato (1919-2008)

Shuichi Kato is an internationally known intellectual representing postwar Japan. Although he was trained as a doctor of hematology who graduated from the Faculty of Medicine at the Imperial University of Tokyo, he also had profound knowledge of French literature and Japanese culture, and his book *A History of Japanese Literature: The First Thousand Years* (Volume 1: 1975, Volume 2: 1980) discusses the characteristics of Japanese literature by referencing them to the details of their historical development, serving as a sort of Bible for overseas researchers of Japanese culture. He taught at a number of universities, such as the University of British Columbia, the Free University of Berlin, Yale University, the University of Geneva, Ca' Foscari University of Venice, Peking University, the University of Hong Kong, the University of Tokyo and Ritsumeikan University.



The Kato Shuichi Collection (Scheduled open in April 2016)

In February 2011, our library received a donation of a great variety of books, posthumous writings and notebooks collected from Mr. Shuichi Kato's home through the bequest of his bereaved family. Since Mr. Kato had a strong affinity for our university, illustrated by the fact that he was a visiting professor at the College of International Relations and the first Director of the Kyoto Museum for World Peace, the generous donation was provided based on the intentions of his bereaved family. We are currently organizing these materials, and plan to establish the "Kato Shuichi Collection" in the Kaichiro Hirai Memorial Library, which is due to open on the Kinugasa Campus in April 2016, making the most of the books and some of the notebooks to be disclosed to the general public. We also plan to make notebooks available in series in the future.

BKC Research Organization of Social Sciences

Research Organization of Social Science (BKC) was founded in 1998 in order to promote research activity in business-related fields, in conjunction

with the relocation of the College of Economics and the College of Business Administration to BKC. Its goal is to advance research with greater

social connectivity by promoting research which fuses economics and technology.

BKC Research Organization of Social Sciences

Institute of Social Systems

Research Center for Finance

Ritsumeikan International Research Center for Gastronomic Science

Research Organization of Open Innovation and Collaboration

Based on the OIC's educational concepts of Asia's Gateway, Urban Co-Creation and Regional Cooperation, the organization promotes activities towards being a research organization that develops world-class human resources, creates new innovations and serves as a core presence in the local community.

While taking advantage of the academic nature and neutrality of our university, we aim for the creation of new values by connecting diverse people and organizations accumulated in the cities around Osaka, fully drawing out the potential

scattered in this diversity and creatively link them together. Furthermore, utilizing its location in the largest city in West Japan and its capital city for trade, Osaka, we also strive to develop education, research and the creation of knowledge by taking advantage of the plentiful number of cases from the local economy, industry, community and society.

Taking on the challenge of solving issues in the community and society as forms of education and research while utilizing connections with the community and society, we will move forward

with contributions to the community and human resource development.

In June 2015, we established the Ritsumeikan Inamori Philosophy Research Center to engage in studies to make Inamori's management philosophy, that is, the practical philosophy of corporate management by Mr. Kazuo Inamori, Chairman Emeritus of KYOCERA, more universally applicable and more widely practiced and to develop of educational programs that enable his philosophy to be mastered.

Research Organization of Open Innovation and Collaboration

The Research and Development on Regional Information Institute

Research Center for Innovation Management

Research Center for Medical and Healthcare Management

Research Center for Design Science

Center for Global MOT Research

Ritsumeikan Inamori Philosophy Research Center

Center for Global MOT Research

Generally speaking, for companies to develop and grow sustainably, it is important to secure and maintain competitive advantages in certain business fields. Otherwise, in a harshly competitive market, companies cannot maintain healthy corporate management. Nowadays, we find common challenges faced by Japanese companies, especially those based on technology. "Even by securing competitive advantages with excellent development technology, are the means to maintain them sufficient?" As an academic and practical method to study this challenge, technology management or management of technology (MOT) has attracted attention. At our Graduate School of Technology Management, we provide education for companies that emphasize technological development and innovation creation

on the basis of technology. Further, as a research organization that can take care of Project-Based Learning (PBL), we established the Center for Global MOT Research in April 2014. This center deals with not only studies on a variety of technology management issues in relation to the creation and promotion of the wider practice of new technologies and new businesses, realization of the sustainable business practices, and accounting, finance and intellectual assets for MOT, but also present and future analysis based on specific cases of MOT, research medium and small-scale companies and community invigoration from an MOT viewpoint and provide international cooperation with global companies and international research organizations. In addition, the center actively hosts training, visiting lectures,

technological instruction and clinical sessions for companies for the purpose of returning the achievements of MOT studies. MOT training for employees conducted with a certain manufacturer (a series of 11 lectures over a year, including training at a camp) has celebrated its 10th anniversary this year. Also, we work closely with research offices and other research centers, focusing on securing external financing and strengthening relationships with industry. The center will continue to create excellent innovations, the creation of profitability throughout their life cycles and the establishment of business models having both of them. Your continued support would be very much appreciated.

Research Organization of Science and Technology

The Research Organization of Science and Technology was established in 1994 as the Research Organization of Science and Engineering (changed to its present name in 2012) to contribute to the development of science and technology and local society. The organization's goal is to contribute to local society through joint research in industry-academia-government partnerships.

The organization sets its mission as the contribution to the development of science technology and communities and society through the promotion of industry-government-academia joint research and develops research across fields, beyond conventional research domains. It also drives research activities closely related to the humanities and social sciences as well as provides

sophistication and invigoration of our research in the field of science technology.

We newly established the Center for Systems Vision Science in April 2015 and the Research Center for Biological Resources in October of the same year.

Research Organization of Science and Technology

The Institute of Science and Engineering

Synchrotron Radiation Center

VLSI Research Center

Research Center for ECO-Technology

Bio Simulation Research Center

Frontier Research Center for Natural Disaster Mitigation

The Bio Medical Devices Center

Research Center for BIWAKO Σ

Advanced Micro/Nano System Technology Research Center

Research Center for Drug Discovery and Development Science

Research Center for Sport and Health Science

Robotics Research Center

Research Center for Energy-innovation Materials

Research Centre for Palaeoclimatology

Research Center for Soft/Hard Hybrid Functional Materials

Research Center for Advanced ICT for Medical and Healthcare

Center for Systems Vision Science

Research Center for Biological Resources

Research Centre for Palaeoclimatology

The earth's climate is constantly changing, but the way it has changed has only been understood through observations over the last few hundreds of years. Over the long history of the earth, climates have repeated great changes that are beyond the imagination of humans. In April 2014, to promote studies to learn about the past, discover the causes of changes and consider what will happen in the future, the Research Centre for Palaeoclimatology

was established at the Biwako-Kusatsu Campus. The Research Centre for Palaeoclimatology is especially talented at climate reconstructions of great detail, using sediment varves. Geology has set long periods of time in the form of tens of thousands of years or hundreds of millions of years as main subjects of study. However, for humans, the changes that take place in a short span of time like a few years or tens of years are more important.

Research details of the Research Centre for Palaeoclimatology

- *Climate reconstruction using the sediment varves of Lake Suigetsu in Fukui Prefecture
- *Climate reconstruction using the sediment varves of Lake Petexbatún in Guatemala
- *Timing comparisons of drastic climate changes by region
- *Higher precision of radiocarbon dating
- *Higher precision of climate reconstruction using pollen fossils

What is a varve?

A thin stratum formed by the accumulation of sediment with the change of the season. As a pair of light and dark stripes is equivalent to a year, if the varves are preserved perfectly, the number of stripes directly represents the number of years. Sediment varves of Lake Suigetsu in Fukui Prefecture have been adopted as an international standard timescale to define the previous 50,000 years. As quality information on natural environments (temperatures, water temperatures, flora, etc.) and natural disasters (earthquakes, tsunamis, floods and volcanic activities) are recorded in varves, research has been making progress both in Japan and overseas.

Publications

Li Guodong

Pan-Pacific Civilization Library #3

"Inasakubunka ni Miru Chugoku Kishu to Nippon" (Guizhou, China and Japan seen from Rice Producing Cultures)

Yuzankaku



Kuniko Muramoto, Tadashi Nakamura, Hozumi Araki (Editors/writers)

"Rinchi no Taijinjenjogaku - Higashinihondaishinsai to Fukko no Monogatari" (Study of Assistance of People on the Spot: Story of the Great East Japan Earthquake and Restoration)

Koyo Shobo



Tatsuya Sato

"Shinrigaku no Meicho 30" (30 Masterpieces of Psychology)

Chikumashobo

**RADIANT, research activity report**

We published the research report, RADIANT, as a forum to introduce the wide range of research activities of Ritsumeikan University. With a theme of "Asia," the first issue describes researchers involved in natural sciences, the humanities and social sciences. In the future, with a perspective built on a single theme, the report plans to continue to introduce specific research being conducted at Ritsumeikan University.

RADIANT is an adjective that means to "shed light" or "shine brightly." We used this meaning so that the research results of Ritsumeikan University can be a step towards creating a bright future and help to shed light upon the world in the future.

RADIANT

RITSUMEIKAN UNIVERSITY

Website for research and industry-government-academia cooperation

Covers all the latest information on research activities

 Website for research and industry-government-academia cooperation
<http://www.ritsumei.ac.jp/research/>

**Awards**

Minister of Economy, Trade and Industry Award
13th Awards for Persons of Merit in Industry-Academia-Government Collaboration

Gang Xu, Professor, College of Information Science and Engineering

Award-winning Reason: Development of 3D vision sensors for industrial robots

31st Masayoshi Ohira Memorial Prize

Jun Honma Professor, College of International Relations

Winning book: "Minshuka no Paradokusu: Indonesia ni Miru Ajia Seiji no Shinso" (Paradox of Democratization: Depth of Asian Politics as seen in Indonesia) (Iwanami Shoten)

"2015 Association Award" (Writing category), Japan Communication Association

Katsuyuki Hidaka, Professor, College of Social Sciences

Winning book: "Showa Nosutarujia towa Nanika: Kioku to Radikaru Demokurashi no Media Gaku" (What is Showa Nostalgia?: Media Study of Memories and Radical Democracy) (Sekaihisosha)

8th Shiseido Female Researcher Science Grant

Ikuko Kitaba, Associate Professor, Research Organization of Science and Technology

Award-winning research subject: "Geological examination of the Svensmark hypothesis: Can the event of a geomagnetic field weakening cause cooling in a short period of time?"

Director-General of the Kinki Bureau of Telecommunications Award "FY2015 Info-Communications Promotion Month"

Nobuhiko Nishio, Professor, College of Information Science and Engineering

Award-winning reason: Significant contribution to the promotion of ICT use and utilization by building a mechanism to maintain the rich lives of residents by creating, for example, new information infrastructures, including a "Geospatial Guiding Light System."

Research Office

The Research Office has a goal of contributing to society through research exchanges, technological transfers, support of ventures, etc., utilizing the intellectual assets of the university. To centralize information on researchers in the university and their diverse external needs and to promote industry-government-academia activities more smoothly, depending on the challenges involved, we serve as an integrated point of contact for all the various matters associated with research.

Research Office at Kinugasa Campus

Humanities and Social Sciences

College of Law, College of Social Sciences, College of International Relations, College of Letters, College of Image Arts and Sciences, Graduate School of Science for Human Services, Graduate School of Core Ethics and Frontier Sciences, School of Law, Graduate School of Public Policy

56-1 Toji-in Kitamachi, Kita-ku, Kyoto 603-8577, Japan

TEL: +81-75-465-8224

FAX: +81-75-465-8342

Mail: liaisonk@st.ritsumei.ac.jp**Research Office at Biwako Kusatsu Campus**

Social Sciences Natural Sciences

College of Economics, College of Sport and Health Science, College of Science and Engineering, College of Information Science and Engineering, College of Life Sciences, College of Pharmaceutical Sciences

1-1-1 Noji-higashi, Kusatsu, Shiga 525-8577, Japan

TEL: +81-77-561-2802

FAX: +81-77-561-2811

Mail: liaisonb@st.ritsumei.ac.jp**Research Office at Osaka Ibaraki Campus**

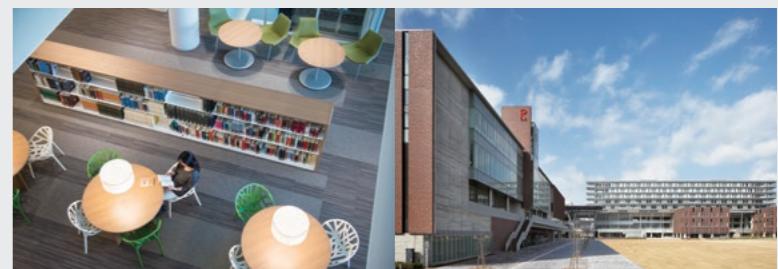
Social Sciences

College of Policy Science, College of Business Administration, College of Comprehensive Psychology (Scheduled to open in April 2016), Graduate School of Technology Management, Graduate School of Management

2-150 Iwakura-cho, Ibaraki, Osaka 567-8570, Japan

TEL: +81-72-665-2570

FAX: +81-72-665-2579

Mail: oicro@st.ritsumei.ac.jp

 Inquiries in relation to delivery of the research report, RADIANT

If you want to suspend shipment of your copy or change your mailing address, please make contact as per the details below:
Office of Research Planning and Development, Ritsumeikan University
TEL: +81-75-813-8199 FAX: +81-75-813-8202 Mail: res-plan@st.ritsumei.ac.jp