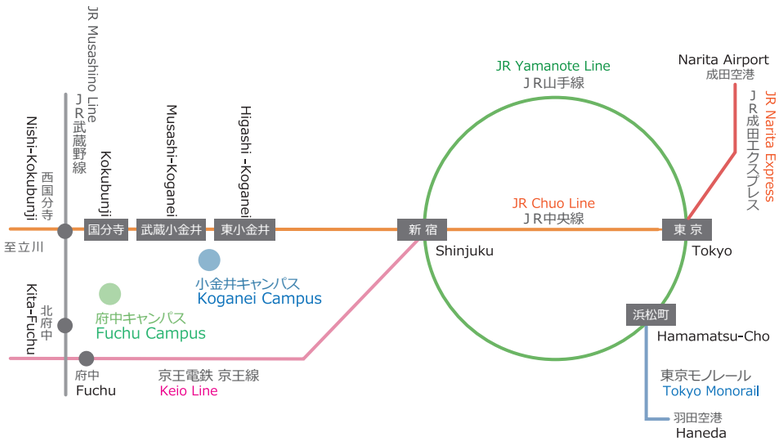
Institute of Global Innovation Research

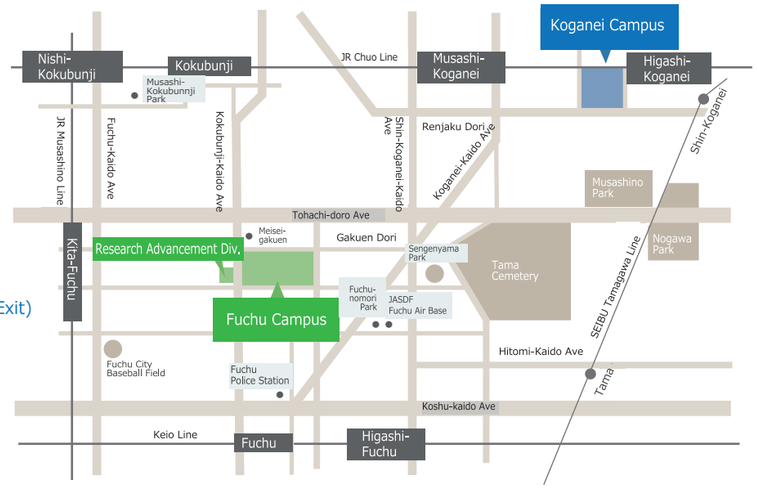
https://en.tuat-global.jp/



Fuchu Campus

3-5-8 Saiwai-cho, Fuchu-shi, Tokyo 183-8509

- JR Chuo Line " Kokubunji Station " (South Exit)
  Keio Bus (Bus Stop #2)
  Bus # 寺 91 bound for "Fuchu Station via Meisei Gakuen,"
  Get off at "Harumi-cho" bus stop
  About 10 minutes
- Keio Line " Fuchu Station " (North Exit)
  Keio Bus (Bus Stop #3)
  Bus # 寺 91 bound for "Kokubunji Station via Meisei Gakuen,"
  Get off at "Harumi-cho" bus stop
  About 7 minutes
- JR Musashino Line "Kita-Fuchu Station"
  About 12 minutes walk



Koganei Campus

2-24-16 Naka-cho, Koganei-shi, Tokyo 184-8588

- JR Chuo Line " Higashi-Koganei Station"
  South Exit : About 8 minutes walk
  nonowa Exit: About 6 minutes walk
- JR Chuo Line " Musashi-Koganei Station" (South Exit)
  About 20 minutes walk

Contact

Research General Affairs/International Affairs Section,
Research General Affairs/Risk Management Office,
Research Advancement Division

3-8-1 Harumi-cho, Fuchu-shi, Tokyo 183-8538
TEL: 042-367-5646
https://en.tuat-global.jp/

Jul. 2025.ed.

Institute of Global Innovation Research

Challenge to the global Problems of "food" and "energy"

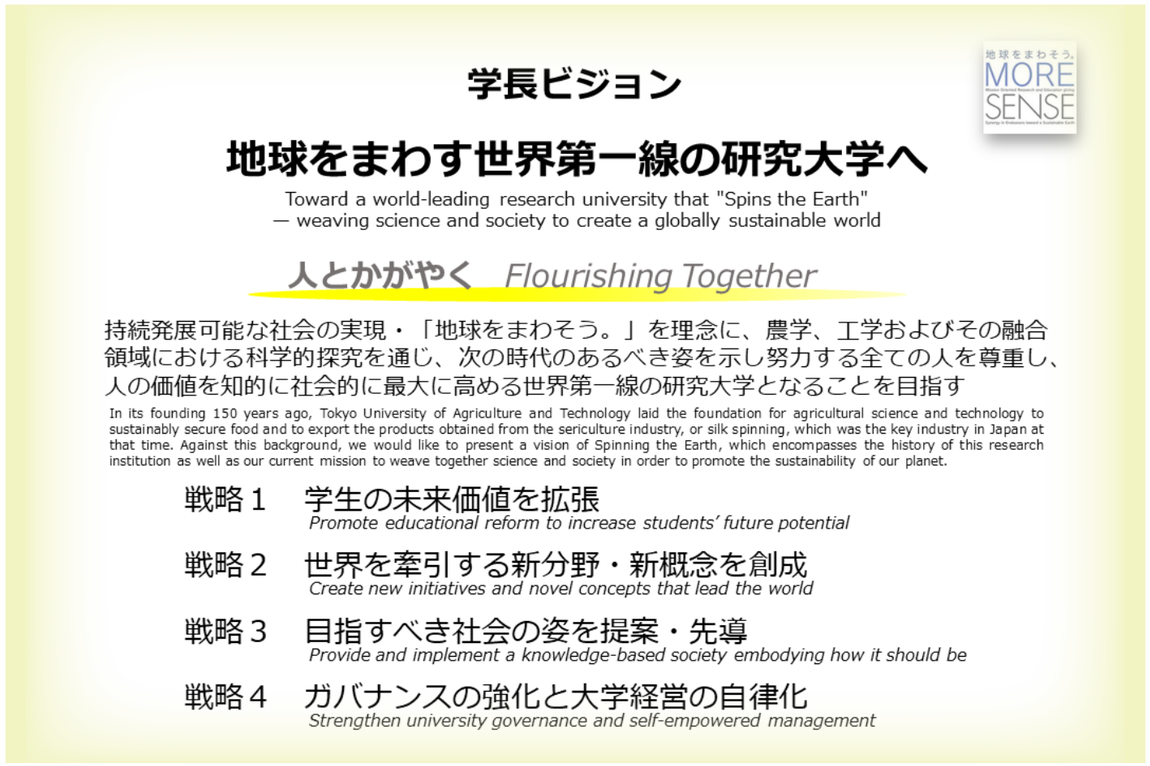
AY2025

Tokyo University of Agriculture and Technology

Message

GIR Dean
Prof. Tomoko Yoshino

TUAT aims to become a world-leading research university through scientific exploration of agriculture, engineering, and related interdisciplinary fields. In 2016, to strengthen our advanced research capabilities, TUAT established the Institute of Global Innovation Research (GIR). At the GIR, we promote international collaborative research in the three key fields of Food, Energy and Life Sciences. We also endeavor to further the careers of promising young researchers and assist them in working on an international scale.
Our strategic research teams welcome the world's leading researchers as core faculty members in each of our fields of research while encouraging TUAT researchers and students to study abroad to build a network for conducting advanced research through international collaborations.
In 2020, we took our efforts further by establishing the Global Research Hub (GRH), which consists of research units that were formed from our strategic research teams. At the GRH, we strive to realize the establishment of independent research centers that also participate in international collaboration.
In April 2025, we launched the ARC Teams initiative (Strategic Research Teams for Advanced Research Careers), aimed at advancing the sophistication of our research activities by combining our traditional practices of hiring and inviting foreign researchers with the overseas dispatch of our faculty members. Through these two-way exchanges, we aim to simultaneously accelerate international joint research and strengthen the basic research capabilities of our faculty members. We will continue to promote the creation of new initiatives to further enhance our globally competitive research capabilities by building upon a foundation of international collaboration.



Approaches

Three Priority Areas : "Food" "Energy" "Life Science"
World-leading Research、Promotion of Young Researchers

a) Invite the world's leading researchers as core members of "Global Research Hub" and "Strategic Research Teams" for research collaboration.
Encourage students to conduct cutting edge research at GIR and to study abroad.

b) Flexible personnel system for promoting and fostering young researchers.

International Collaborative Research Center
Global Research Hub
①Research Center of Informatics for Human-Animal Interaction
②Research Center for Nitrogen and Phosphorus Upcycling
World-leading research
Global brain circulation of researchers

Boost the number of international co-authored papers
Submission to high-impact journals

Priority Field 1 FOOD
Solve the problems in food production and environmental depletion.
- Conservation of Regional Biodiversity
- Environmental Stress Resistance of Plant
- Plastic Pollution
- Green Infrastructure
- Biomass Production

Priority Field 2 ENERGY
Solve energy problems through the development of capacitors/LEDs and application of ionic liquids.
- LED
- Li-Ion Battery
- Green Manufacturing
- Resource/Energy Recovery
- Environmental-friendly Process for the Production of Useful Compounds

Priority Field 3 LIFE SCIENCE
Development in advanced technologies on protein science and biomedical science.
- Disease
- Drug Discovery
- Health
- Microorganism
- Cell Biology

History

2014	Established "Global Innovation Research Organization (GIRO)" launched with 9 Strategic Research Teams
2016	Reorganization of "GIRO" as "Institute of Global Innovation Research (GIR)" integrates all of the following organizations ・Global Innovation Research Organization ・Women's Future Development Organization ・Organization for Promotion of Tenure-track System ・Innovation Advancement Organization
2018	Launched "Field Group" and "Strategic Research Initiative for Interdisciplinary Field" in the GIR
2019	Removed"Innovation Advancement Organization" from the GIR
2022	Launched "Global Research Hub (GRH)"in the GIR Termination of "Field Group" and "Strategic Research Initiative for Interdisciplinary Field"
2023	Launched two research centers in the GRH ・Research Center of Informatics for Human-Animal Interaction ・Research Center for Nitrogen and Phosphorus Upcycling
2025	Launched ARC teams in the GIR

Global Research Hub (GRH)

Research Center of Informatics for Human-Animal Interaction

Prof. Toshihisa Tanaka
Division of Advanced Electrical and Electronics Engineering, Institute of Engineering

Dr. Fabien Lotte
Inria Centre at the University of Bordeaux (France)

Research Center for Nitrogen and Phosphorus Upcycling

Prof. Akihiko Terada
Division of Applied Chemistry, Institute of Engineering

Dr. Susanne Lackner
Technical University of Darmstadt (Germany)

Teams for Advanced Research Career (ARC)

Yoshida Team

Establishment of a platform for developing innovative woody biomass materials based on the hierarchical structure of trees

Prof. Makoto Yoshida
Division of Natural Resources and Ecomaterials, Institute of Agriculture

Dr. Redouane Borsali
Grenoble Alpes University (France)

Kawano Team

Lipid Modalities: Integrative Approaches Combining Metabolomic Profiling and Synthetic Membrane Systems

Prof. Ryuji Kawano
Division of Biotechnology and Life Science, Institute of Engineering

Dr. Takanari Inoue
Johns Hopkins University (U.S.A.)

Akasaka Team

Research on biodiversity and ecosystem conservation taking into account synergies and trade-offs of ecosystem services

Prof. Munemitsu Akasaka
Institute of Global Innovation Research

Dr. Tatsuya Amano
The University of Queensland (Australia)

Food

Food is one of the critical challenges that the international community is currently facing. Particularly, food shortages afflict many people living mainly in the Asia-Pacific region.

Because these problems relate closely with global environmental concerns, "Food" as a priority theme encompasses both food production and environmental science to solve these issues.

Kato Team

Watershed scale ecosystem services assessment through water saving irrigation with Smart Agriculture

Prof. Tasuku Kato
Division of International Environmental and Agricultural Science, Institute of Agriculture

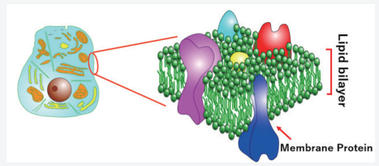
Dr. Claudio Gandolfi
University of Milan (Italy)

Julien Boulange Team

Determining the role of global agricultural systems in mitigating flood events

Assoc. Prof. Julien Boulange 准
Division of International Environmental and Agricultural Science, Institute of Agriculture

Dr. Simon Gosling
University of Nottingham (U.K.)



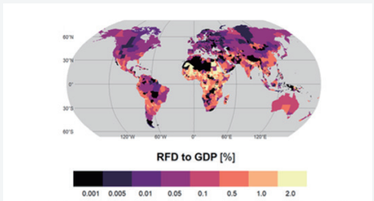
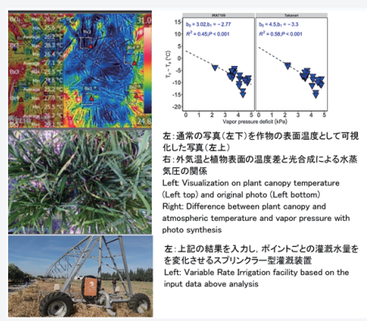


Fig. 1: Residual flood damage (RFD) as a percentage of national gross domestic product (GDP) under ssp585 (representing a resource-hungry society that relies on fossil fuels paired with high greenhouse gas concentrations) and after intensive adaptation using hard flood protection.



左：通常の写真（左下）を作物の表面温度として可視化した写真（左上）
右：外気温と植物表面の温度差と光合成による水蒸気圧の関係
Left: Visualization on plant canopy temperature (Left top) and original photo (Left bottom)
Right: Difference between plant canopy and atmospheric temperature and vapor pressure with photo synthesis

左：上記の結果を入力し、ポイントごとの灌漑水量を変化させるスプリンクラー型灌漑装置
Left: Variable Rate Irrigation facility based on the input data above analysis

Energy

The rising energy consumption on a global scale in recent years is expected to continue, and energy issues should therefore be considered to be a great challenge facing humanity.

"Energy" as a priority theme addresses energy problems according to the application of capacitors, LED, and ionic liquids, while adding a new dimension to these research areas.

Iwama Team

Next Gen. Post-Li-ion Batteries for Carbon Neutral Society

Assoc. Prof. Etsuro Iwama
Division of Applied Chemistry, Institute of Engineering

Dr. Patrice Simon
Paul Sabatier University (France)

Mizuuchi Team

Towards Three-Dimensional Autonomous Mobile Robot through the International Joint Research on Informatics, Robotics, Cybernetics, and Artificial Intelligence

Prof. Ikuo Mizuuchi
Division of Advanced Mechanical Systems Engineering, Institute of Engineering

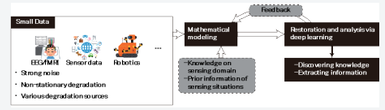
Dr. Václav Hlaváč
Czech technical university (Czech Republic)

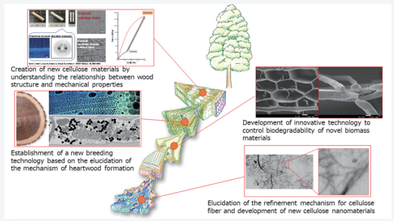
Kubo Team

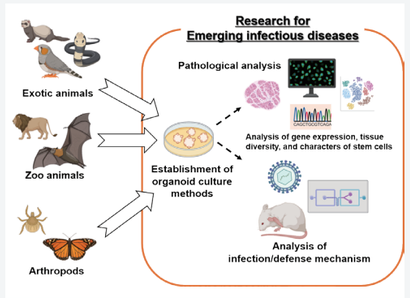
Metasurface Energy Harvesting for powering IoT devices

Prof. Wakana Kubo
Institute of Global Innovation Research

Dr. Xu Fang
University of Southampton (U.K.)







Life Science

Life science has a significant impact on our health and well-being and is an important science area that directs us to find a solution for food and energy issues as a fundamental technology.

"Life Science" as a priority theme pushes and precedes the edge of technical possibility, mainly in protein synthesis and life science itself.

Usui Team

Establishment of a research base using organoids from non-model organisms

Assoc. Prof. Tatsuya Usui
Division of Animal Life Science, Institute of Agriculture

Dr. Wael Mohamed El-Deeb
King Faisal University (Saudi Arabia)

Yatabe Team

Mathematical Modeling and Deep Learning for Small-Data AI

Assoc. Prof. Kohei Yatabe
Division of Advanced Electrical and Electronics Engineering, Institute of Engineering

Dr. Andrzej Cichocki
Polish Academy of Science (Poland)

Hamabe Team

Evaluation of the interplay between oncological and cardiovascular diseases in veterinary medicine

Assoc. Prof. Lina Hamabe
Division of Animal Life Science, Institute of Agriculture

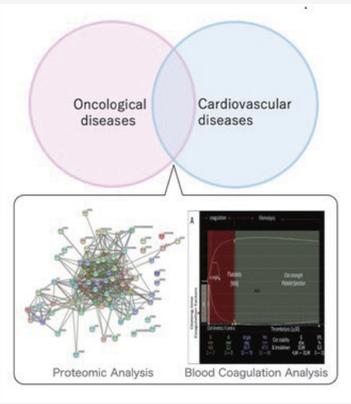
Dr. Zeki Yilmaz
Bursa Uludag University (Turkey)

Sakurai Team

Development and target identification of anticancer and antifungal agents for new therapeutic modalities

Prof. Kaori Sakurai
Division of Biotechnology and Life Science, Institute of Engineering

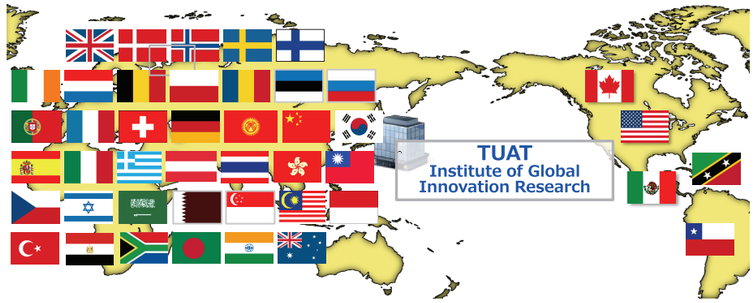
Dr. Bengang Xing
Nanyang Technological University (Singapore)

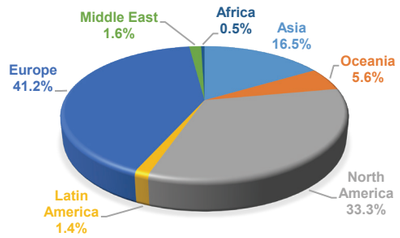


Research Collaborations

◆ 43 Countries, 186 Universities

Asia	Oceania	North America	Latin America	Europe	Middle East	Africa	Cumulative Headcount
71	24	143	6	177	7	2	430





◆ GIR Open Seminar

Number of GIR Open Seminar : 534	
2014 (Aug.~)	18
2015	44
2016	41
2017	58
2018	73
2019	88
2020	21
2021	30
2022	49
2023	59
2024	53

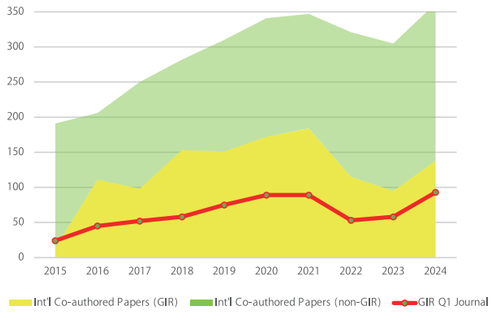
◆ Press Release

Number of Press Releasee GIR vs TUAT Total		
2014 (Aug.~)	5 / 15	33.3%
2015	6 / 14	42.8%
2016	9 / 21	42.8%
2017	13 / 25	52.0%
2018	13 / 27	48.1%
2019	32 / 52	61.5%
2020	26 / 47	55.3%
2021	40 / 67	59.7%
2022	35 / 61	57.3%
2023	32 / 61	52.5%
2024	41 / 59	69.5%

◆ WoS International Co-authored Papers

	2015	2020	2021	2022	2023	2024
No. of Researchers	400	378	386	392	402	402
No. of Researchers (GIR)	52	118	101	93	103	119
No. of Co-authored Papers	197	363	347	314	305	362
No. of Co-authored Papers (GIR)	42	176	190	131	95	138

◆ Number of WoS International Co-Authored Papers (GIR vs Non-GIR)



Achievements - Strategic Research Teams

2019 - 2021 Arakaki Team

Research Theme: Understanding and application of regulation mechanisms of hardness and toughness of biological hard materials

University of California Irvine (U.S.A.)

Prof. David Kisailus

TUAT

Prof. Atsushi Arakaki

What are the benefits of conducting research at GIR?

- Trusted collaborators
- Opportunity for biweekly free-discussion with overseas collaborators
- Students entering a doctoral program

Title : zzzToughening mechanisms of the elytra of the diabolical ironclad beetle
Nature 586, 543-548 (2020)
DOI10.1038/s41586-020-2813-8

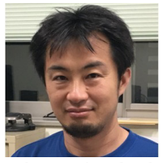
2021 - 2023 Koike Team

Research Theme: Research on biodiversity and ecosystem conservation taking into account synergies and trade-offs of ecosystem servicesh

University of Queensland (Australia)

Dr. Tatsuya Amano

TUAT



Prof. Munemitsu akasaka

What are the benefits of conducting research at GIR?

- Less negative impact in the COVID-19 pandemic
- Positive impact on students by working with world's top researchers

Title : The role of non-English-language science in informing national biodiversity assessments
Nature Sustainability 6 (7) , 845-854 (2023)
DOI10.1038/s41893-023-01087-8

2018 - 2021 Terada Team

Research Theme: A new nitrogen management system in water/wastewater treatment

Korea Advanced Institute of Science and Technology (Republic of Korea)

Dr. Sukhwan Yoon

TUAT

Prof. Akihiko Terada

What are the benefits of conducting research at GIR?

- Deeply recognised the importance of submitting to top journals and improving the quality of research through the collaboration with world's top researchers
- New overseas research collaborators through existing team members
- The increasing number of co-authors brings the opportunities to organize sessions at international conference, write opinion papers, and etc.
- Increasing number of co-author invitations

Title: Organic carbon determines nitrous oxide consumption activity of clade I and II nosZ bacteria: Genomic and biokinetic insights
Water Research 209 , 117910 (2022) DOI10.1016/j.watres.2021.117910