Ignite curiosity.
Explore the unknown.
Create the future.

Tsukuba Institute for Advanced Research
University of Tsukuba

TIAR is a research institute established by researchers for researchers and society.

We are committed to conducting research at the highest international standards, with the mission of pioneering new academic domains and fostering the autonomous development of both the institute and its researchers. To fulfill this mission, researchers from across the globe, guided by intellectual curiosity and a profound sense of ethical responsibility, work across disciplinary boundaries to generate new scholarly value.

Organizational Structure and Overview

Introducing the Organizational Structure of the TIAR

Tsukuba Institute for Advanced Research

- TIAR Committee
  - Human Resources Strategy Comittee
  - Office for Strategy Promotion
    - Jihatsu Research Unit
    - Society and Science Research Unit

- Featured Research Centers
  - International Institute for Integrative Sleep Medicine(IIIS)
  - Center for Artificial Intelligence Research (C-AIR)
  - Microbiology Research Center for Sustainability (MiCS)
  - Hydrogen Boride Research Center (HBRC)

Jihatsu Research Unit

This unit secures extended research time, enabling early- and mid-career researchers to pursue their work proactively. Through connections across disciplines, it fosters new ideas and encourages researchers to grow into frontrunners in their respective fields.

Society and Science Research Unit

This unit brings together researchers from the natural sciences and the humanities and social sciences to advance research that integrates societal perspectives. It enables researchers to envision future societies from diverse viewpoints and create new value that supports sustainable development.

Tsukuba Institute for Advanced Research

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Tsukuba Institute
for Advanced Research

Our Research Initiatives — Featured Research Centers



IIIS
INTERNATIONAL INSTITUTE FOR INTEGRATIVE SLEEP MEDICINE

wpi

International Institute for Integrative Sleep Medicine (IIIS)

YANAGISAWA Masashi
Director of International Institute for Integrative Sleep Medicine

Although sleep is an everyday event, the nature of sleepiness, the physiological significance of sleep, and its associations with body functions remain poorly understood. It is reported that, in comparison to other countries, people in Japan have exceptionally short sleep time, which may cause performance decline, risks to both physical and mental health, and various economic losses resulting from the sleep debt. To address these issues, the International Institute for Integrative Sleep Medicine (IIIS) at the University of Tsukuba, under the leadership of Director Masashi Yanagisawa, has established the interdisciplinary field of integrative sleep medicine by combining neuroscience, clinical research, pharmaceutical science, and data science, and pursues the neuronal basis of sleep-wake control at the globally top level. Furthermore, as the university's only World Premier International Research Center Initiative (WPI), IIIS promotes international brain circulation and serves as a hub institution in global scientific research.



CENTER FOR ARTIFICIAL INTELLIGENCE RESEARCH

Center for Artificial Intelligence Research (C-AIR)

FUKUI Kazuhiro
Director of Center for Artificial Intelligence Research

The Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba serves as a hub for AI-related research across the university and aims to develop AI that supports human activity. While clarifying the principles of knowledge representation, extraction, and utilization in AI, the center also promotes interdisciplinary research in areas such as ELSI (ethical, legal, and social implications), international regulatory alignment, privacy-enhancing AI, and quantum computing, contributing to the development of social infrastructure for human-centered AI. In 2024, a new Japan–U.S. AI cooperation framework was included in the joint statement of the Japan–U.S. summit. As part of this initiative, the University of Tsukuba formed a partnership with the University of Washington, Amazon, and NVIDIA to advance projects in robotics, health, aging, and longevity, climate and sustainability, improving AI model efficiency, and trustworthy AI.



MiCS
Microbiology Research Center for Sustainability

Microbiology Research Center for Sustainability (MiCS)

NOMURA Nobuhiko
Director of Microbiology Research Center for Sustainability

Most microorganisms are invisible to the naked eye, yet their total biomass on Earth exceeds that of all animals, including humans, by over 50 times. They are integral to global biogeochemical cycles, inhabiting water, soil, and other ecosystems. The human gut alone contains around 60 trillion microbial cells—surpassing the body's 38 trillion human cells—underscoring the profound symbiosis between microbes and life on Earth. Directed by Nobuhiko Nomura, the Microbiology Research Center for Sustainability (MiCS) promotes the elucidation of the unknown, control, and application of microbes through interdisciplinary collaboration across medicine, natural sciences, engineering, agricultural sciences, and environmental and social fields.



HBRC
Hydrogen Boride Research Center

Hydrogen Boride Research Center (HBRC)

KONDO Takahiro
Director of Hydrogen Boride Research Center

In 2017, a research team led by Professor Takehiro Kondo successfully synthesized hydrogen boride, a material that plays a key role in hydrogen production, transportation, storage, and utilization, all of which are critical components for realizing a carbon-neutral society.

Hydrogen boride is expected to be used not only for hydrogen applications, but also as a fuel for laser fusion and in space exploration.

The Hydrogen Boride Research Center at the University of Tsukuba established on April 1, 2025, aims to become a global hub for hydrogen boride research, contributing to research and application across the fields of materials, fusion energy, space, health and medicine, and environmental energy.