

# Welcome to OIST

Born from an ambitious vision, the Okinawa Institute of Science and Technology is a pioneering graduate university dedicated to driving groundbreaking science that shapes a sustainable future for Okinawa and the world.



Nov 2021 – New five-year strategy launched

APR 2023 – Lab 5 opened

Nov 2021 – 10<sup>th</sup> anniversary

APR 2020 Lab 4 opened

Milestones

DEC 2018 OIST Innovation Incubator opened

FEB 2018 – First graduation ceremony

JUL 2016 – Marine Science Station opened

JUN 2015 Lab 3 opened

SEP 2012 - First PhD students enrolled

JUN 2012 Lab 2 opened

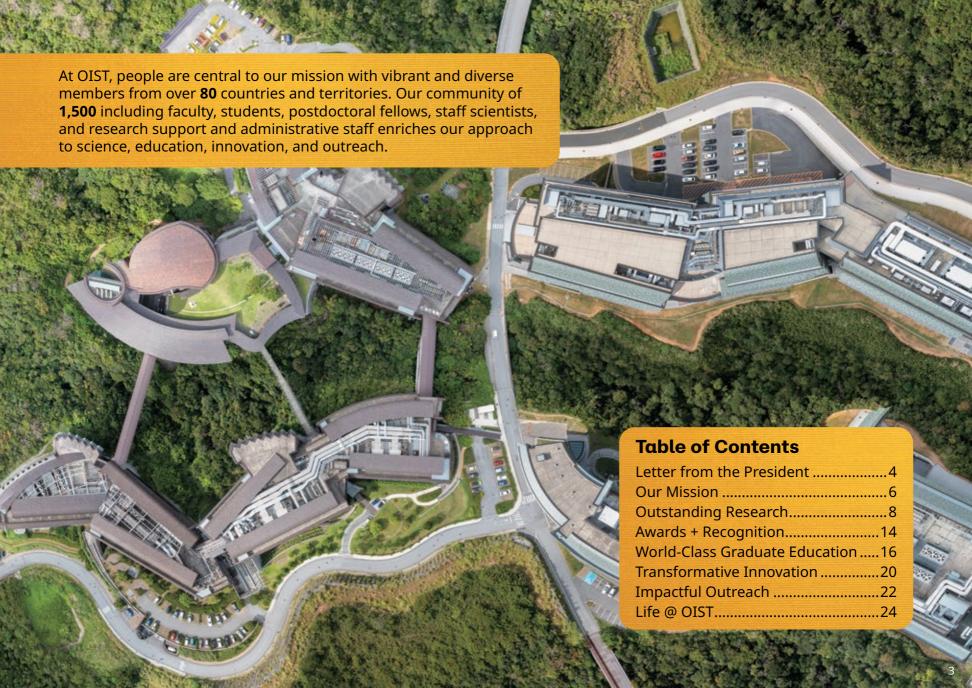
NOV 2011 - University accredited

MAR 2010 First lab and the Center Building opened

MAR 2006 - Seaside House opened

APR 2003 – Onna Village selected as location

JUN 2001 LA new international graduate university in Okinawa announced by the Honorable Koji Omi





Welcome to the Okinawa Institute of Science and Technology (OIST), a leading research and graduate university that serves as a pivotal gateway between Japan and the world, where curiosity fuels discovery. Located in a subtropical forest and overlooking vibrant coral reefs, OIST offers a unique environment, free from disciplinary and organizational boundaries.

This bold investment by the Japanese government has attracted world-leading scientists who conduct truly interdisciplinary research and education, driven by unmatched curiosity and inventive power. The unprecedented success of OIST in its first decade demonstrates our expertise in governing excellence in interdisciplinary research and leadership, setting the stage for further development.

OIST plays a three-dimensional role — globally, nationally, and locally — providing trustworthy leadership in society and bridging gaps with knowledge-based transformations. This creates an optimal environment for business creation, fostering a collaborative ethos and a sustainable future.

We take pride in our commitment to free, knowledge-seeking research and our ability to combine this with collaborative spaces for reasoning. These dimensions allow curious minds to explore the mysteries of life and the universe, which are essential for a complete society.

As we move forward, OIST is poised for even greater impact. We are steadfast in expanding our networks and partnerships by leveraging our strengths and continuing to lead in scientific discovery through exploratory research. We are dedicated to clustering research strengths, tackling complex global challenges, enhancing visibility, and fostering leadership training and co-creation in collaborations. We are committed

to fostering transformative innovation and impactful outreach and disseminating knowledge to society through trust-based partnerships. We are proud to be a hub for groundbreaking research, a global gateway for contributing to the sustainable development of Okinawa, and a catalyst for promoting networks, collaboration, and mobility within science and technology in Japan.

Our reputation for excellence in science and graduate education is built on the strength of our world-class faculty, state-of-the-art facilities, and an academic environment that fosters curiosity and collaboration. Our goal is to strengthen our unique model and thrive in an ever-evolving global landscape. We are dedicated to contributing to a resilient and sustainable world, ensuring that OIST fulfills its mission and plays a crucial role in addressing local, national, and global challenges.

Warm regards, Karin Markides

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Conduct outstanding curiosity-driven research and internationally renowned graduate education.

Explore intersections between disciplines and knowledge-building outreach, and nurture creative and transformative innovations.

Contribute to the sustainable and prosperous development of Okinawa, and promote and sustain the advancement of science and technology in Japan and throughout the world.



OIST is a global leader in scientific and technological discovery with a culture of excellence that drives groundbreaking research across disciplines. Our commitment to scientific rigor advances knowledge and also yields tangible benefits for society by educating future leaders, generating innovations that enhance lives, and driving impactful development for Okinawa, Japan, and the world.

Our unique approach emphasizes interdisciplinarity and collaboration and crosses traditional barriers to unlock new possibilities. Researchers from diverse fields work together, supported by cutting-edge core facilities and hightrust funding. This environment fosters long-term, high-potential projects that address pressing global-to-local challenges. Since 2012, our researchers have produced over 4,500 publications and delivered more than 9.300 scientific presentations, reflecting the significant output and wide-reaching impact of our research, with faculty numbers growing from 46 in 2012 to 89 in 2024.\*

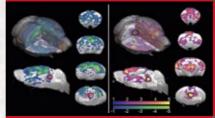
OIST's international orientation attracts top talent from around the world, creating a vibrant community where scientists of diverse backgrounds learn from each other and develop fluency in the global language of science — English. This environment strengthens Okinawa's position as an intellectual hub and attracts ambitious faculty members, students, postdoctoral fellows, staff scientists, research support staff, and administrative staff members. Our collaborative spirit is further evidenced by the fact that more than **two-thirds** of our scientific publications involve international collaborators, and **30%** include co-authorship with Japanese partners, highlighting our global integration and domestic engagement.

Our professors are exploring areas including biology, chemistry, computer science, ecology and evolution, engineering and applied sciences, marine sciences, mathematics, neuroscience, quantum, and physics, with a strong emphasis on interdisciplinarity. Each research unit is led by a faculty member — an assistant, associate, or full professor — who is tasked with advancing knowledge and also with nurturing the next generation of leaders in society. This commitment to excellence and mentorship has led to our faculty, researchers, and students being recognized nationally and internationally for their significant scientific contributions.

At OIST, we champion scientific freedom as a cornerstone of our world-class research. By attracting top talent from Japan and around the world, we create an environment where scientists can independently pursue their curiosity. Each research unit has a dedicated budget, enabling bold and innovative research directions under a high-trust funding model. This autonomy is balanced with accountability, where each unit undergoes a rigorous external review every five years to ensure it meets the highest scientific standards and delivers tangible results. These reviews are an important hallmark of our commitment to excellence.

### First to develop

a new strain of rice that helps prevent obesity-related diseases.



## First to study

how activating the brain's serotonin center affects animals that are awake.



and measure dark excitons — excited states of matter found in semiconductors.



## First to grow

reef-building coral cells in the lab.



#### First to simulate

how hurricanes may impact inland communities.



<sup>\*</sup>All numbers are as of May 2024, unless otherwise noted.

#### **Core Facilities**

Our Core Facilities are central to our research excellence, providing researchers with state-of-the-art equipment, specialized expertise, and a collaborative environment essential for pioneering interdisciplinary research. By centralizing resources, we alleviate the need for individual labs to acquire and maintain costly equipment and staff, allowing researchers to focus on discovery and innovation.

Our facilities support a broad spectrum of disciplines — from engineering to imaging and scientific computing to sequencing — enhancing efficiency, reliability, and the speed of research outputs. While primarily dedicated to OIST researchers, select access is also available to external collaborators, enabling focused partnerships that expand the reach and impact of our cutting-edge resources.

#### **OIST's Visiting Program**

Our Visiting Program addresses a critical need for collaboration across diverse fields. Based on successful models in the theoretical sciences, it brings together experimental and theoretical scientists from all career stages, fostering interdisciplinary exchanges. Since its inception in 2022, the program has enhanced global scientific collaboration and advanced research at OIST by hosting 150 scientists from 110 research institutes across 25 countries. The results have been remarkable, producing more than 80 seminars, over 60 research articles, seven workshops, five outreach events in local schools, and 50 public lectures.\*

"One of our goals is to develop a supplement that protects cell membranes and slows aging. We're conducting basic research on cell and organismal aging and collaborating with Suntory Wellness to perform chemical screenings to identify the necessary compound. It sounds like science fiction, but reversing cell aging and restoring hair color has already been achieved in mice."

— Keiko Kono, Assistant Professor, Yeast Genetics Forum President's Award



"I'm a computer scientist, an electrical engineer, a mathematical scientist, and a physicist — and at OIST I can do all those things. So while my unit's research spans many length scales and disciplines, the seemingly different projects are united by the aim to gain understanding of and explore links between fundamental physical phenomena."

— Mahesh Bandi, Professor, Fluid Dynamics Research Prize



"My research focuses on the biological intelligence of cephalopods — octopuses, cuttlefish, and squid. These animals vastly differ from humans and display remarkable intelligence. OIST's location is ideal because Okinawa's coral reefs host a diverse range of cephalopod species. Here, we can observe their complex behaviors in the field, breed them in our Marine Science Station, and study them in our lab with OIST's cuttingedge equipment."

— Sam Reiter, Assistant Professor

\*As of Aug. 2024.

#### **Open Centers**

At OIST, the Open Centers are dynamic hubs that enhance the university's visibility in targeted research clusters and foster interdisciplinary research through shared scientific visions. These Centers promote open science and enhance collaboration, visibility, and exchanges with researchers from other universities and industry partners. Open Centers also harness opportunities for external funding and donations, supporting talent recruitment at all levels to advance OIST's strategic objectives.



#### **OIST Center for Quantum Technologies**

Established in 2022, the OCQT hosts **18** research units to advance interdisciplinary quantum science research. Focused on the frontier of the field, the Center specializes in quantum computation, communication, sensing, cryptography, and cybersecurity. Quantum advancements are set to transform device connectivity and data security, dramatically increasing computational speed and efficiency, and redefining our daily interactions with technology.

#### **OIST Energy neXus**

OIST is dedicated to advancing sustainable energy solutions to address regional and global challenges, including climate change and energy security. Focusing on energy capture, distribution, smart grid solutions, transportation, storage, and efficiency, the Energy neXus seeks to enhance energy system resilience, explore self-sustained solutions, and reduce carbon emissions, particularly in island ecosystems like Okinawa. Collaborations with partners such as Stanford University, the University of Hawai'i, Okinawa Electric Power Company, NTT, Orion Breweries, and local and national governments bolster these efforts, establishing OIST as a leader in sustainable energy research and innovation.

#### **Partnership and Collaboration**

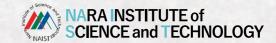
To enhance our scientific research and education capabilities and amplify our impact, we collaborate with partners across industry, government, and academia. We work with hundreds of entities, but a selection of key academic collaborators is below.

#### **Domestic Partners\***





















#### International Partners

- Chalmers University of Technology, Sweden
- Max Planck Society, Germany
- National Centre for Scientific Research (CNRS), France
- ·Scripps Institution of Oceanography, U.S.A.
- Standford University, U.S.A.
- University of Cambridge, U.K.
- ·University of Hawai'i, U.S.A.
- University of Oxford, U.K.

#### **BRIDGE Network**

OIST is also a proud member of the BRIDGE Network, uniting **five** distinguished institutes across **four** regions to strengthen excellence in scientific research and education through collaboration and exchange.







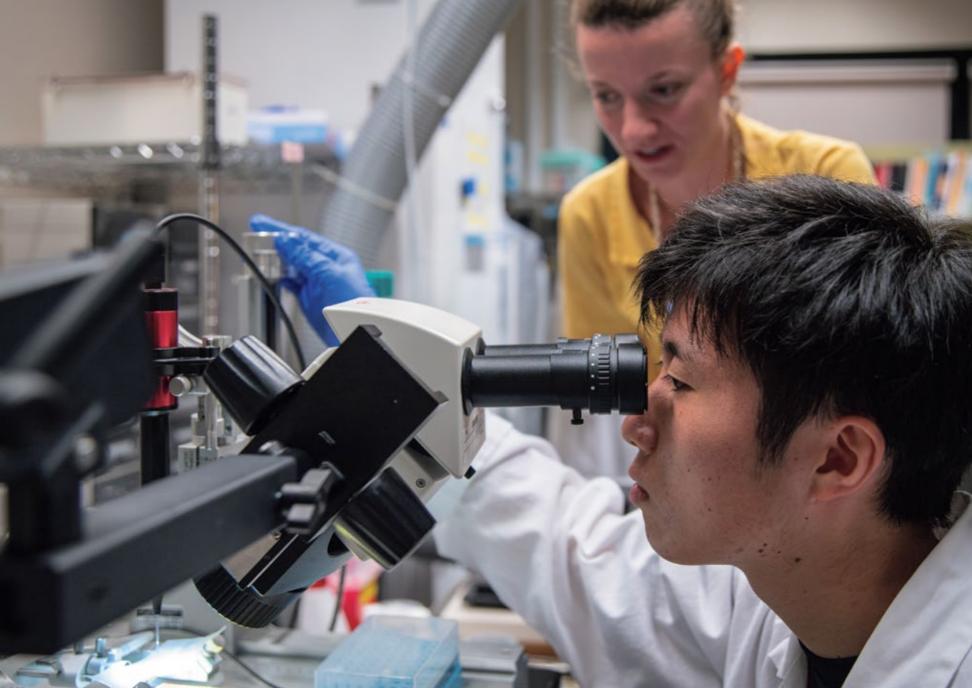


#### MIRAI

OIST is a member of MIRAI, a partnership between **17** Swedish and Japanese universities contributing to long-term research collaboration and promoting Sweden and Japan as nations of world-leading, large-scale research infrastructure.



<sup>\*</sup>OIST values collaboration with numerous academic partners. This list is limited to those with whom we have established institutional collaborations or are partners in the Japan Ministry of Education, Culture, Sports, Science and Technology's (MEXT) program for "Forming Japan's Peak Research Universities" (J-PEAKS).





We have achieved remarkable results for a young university. When normalized for size, OIST ranked **first** in Japan and in the top **10** globally for the quality of research publications in the natural sciences, according to the *Nature Index 2019*.

In addition to institutional accolades, our faculty members, researchers, and students have been recognized individually, receiving **155** awards since 2014. These honors reflect the high caliber and significant impact of their work, underscoring the global recognition of OIST's contributions.



## 1 Nobel Prize



## 15 International Scientific Society Fellows



## 5 National Medals

4 from Japan 1 from France

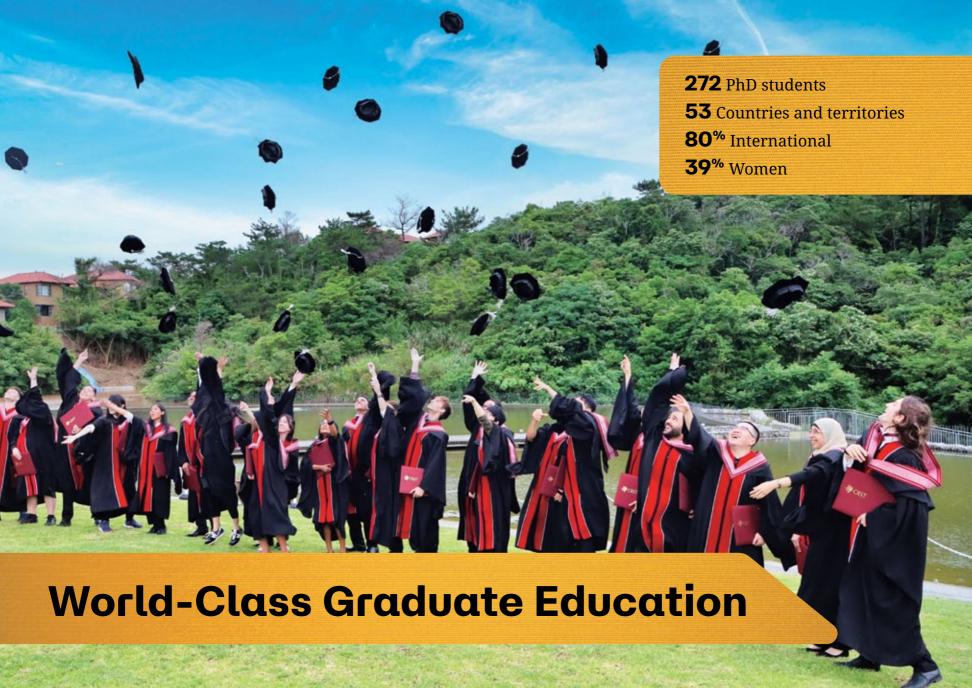


## 3 Japan Society for the Promotion of Science (JSPS) Prizes

#### **Nobel Laureates**

OIST's history is enriched by contributions from Nobel Laureates, from our first president Sydney Brenner, awarded in 2002, to our founding leaders including Steven Chu (1997), Jerry Friedman (1990), Tim Hunt (2001), Yuan T. Lee (1986), Susumu Tonegawa (1987), and Torsten Wiesel (1981).

This tradition of scientific excellence and global impact continues with our current Board of Governors, featuring laureates Ben L. Feringa (2016), Serge Haroche (2012), Ryoji Noyori (2001), and Akira Yoshino (2019). Adding to this lineage, OIST Adjunct Professor Svante Pääbo was honored with the 2022 Nobel Prize for his groundbreaking research on extinct hominins and human evolution.



At OIST, we are committed to providing first-rate PhD education that meets the highest international standards. Each year, through a highly selective process we admit about **60** students into our fully funded five-year program. These students join an international cohort from over **50** countries and territories, fostering a dynamic and interdisciplinary community.

With a **3:1** student-to-faculty ratio, we ensure personalized attention and a tailored educational experience. Our curriculum is designed to train students to collaborate across traditional disciplinary boundaries, solve complex problems, generate new knowledge, shift mindsets, and drive innovation.

OIST graduates are not only academically accomplished but also emerge as well-rounded leaders.
Our alumni have secured significant positions in academia and industry, with about **a third** starting their careers in Japan (including those coming from abroad).

We aim to lead international graduate education in Japan, preparing scientific leaders equipped to address some of the world's most urgent challenges.



"My academic background covers multiple fields — from biomedical engineering to astrophysics — and is driven by an ongoing search for novel understanding between disciplines. At OIST, I explored connections between quantum magnets and gravity with a sight to materials that could one day seed the development of new knowledge or technologies. In this process, OIST's diverse alumni were an invaluable collaborative resource to me, which serendipitously brought my research to a groundbreaking level."

— Leilee Chojnacki, BSc (National University of Ireland Galway), MSc (University of Waterloo, Canada), PhD '24



"As a student, OIST is providing an individualized program catered to my career path and development utilizing in-house technology and personnel. Having the freedom to focus only on science, as this is a fully funded PhD program, as well as having access to OIST resources has allowed me to dive deeply into my research, preparing me for a successful career in academia or industry."

— Nonno Hasegawa, BSc (University of Guelph, Canada), PhD '25, JSPS Doctoral Research Fellowship



"Ever since I attended OIST's open campus as a fifth grader, it has had a huge impact on me. Now, as a PhD student here, I see firsthand how OIST is striving to integrate local knowledge and resources with scientific advancements, positioning itself as a potential leader in driving scientific and economic development in Okinawa."

— Sutashu Tomonaga, BEng (Waseda University, Japan), PhD '26

#### **Alumni**

Over **160** OIST alumni are actively addressing academic, industrial, and socio-economic challenges in Japan and worldwide. They are engaging in basic and applied research, leading industries, and founding startup companies as they advance their careers after OIST. Our graduates have secured tenure-track faculty positions at prestigious universities, such as the University of Tokyo, Academia Sinica (Taiwan), Max Planck Institute (Germany), Caltech (U.S.A), and Massachusetts Institute of Technology (U.S.A.), as well as landed roles in major companies like Amazon Web Services (Japan), Roche (Switzerland), and Johnson & Johnson (Sweden).

Each year, the Peter Gruss Doctoral Dissertation Excellence Award recognizes and rewards an outstanding OIST PhD thesis.

- 2024 winner, Vivek Pareek, is a postdoctoral research associate in physics at Caltech (U.S.A.).
- 2023 winner, Agneesh Barua, is a Human Frontier Science Program long-term postdoctoral fellow at the University of Lausanne (Switzerland).
- 2022 winner, Paavo Parmas, is a programspecific Assistant Professor at Kyoto University's Graduate School of Informatics.
- 2021 winner, Han Yan, is an Assistant Professor at the University of Tokyo's Institute of Solid State Physics.



"I owe a lot of the success I had during my postdoctoral work to the training and mentoring I received at OIST. I am especially thankful to [my supervisor] for his continued support, encouragement, and advice during and after my PhD."

> — Faisal Mahmood, PhD '17, Associate Professor, Harvard Medical School



"After working for several years as a science educator, I joined OIST to merge my passions for academia and conservation. During a PhD lab rotation, I re-discovered a fascinating marine organism that came to be the focus of my dissertation research. One of the biggest challenges during my PhD turned out to be that I had limited experience with computational methods and programming, which is now the part of my work I most enjoy."

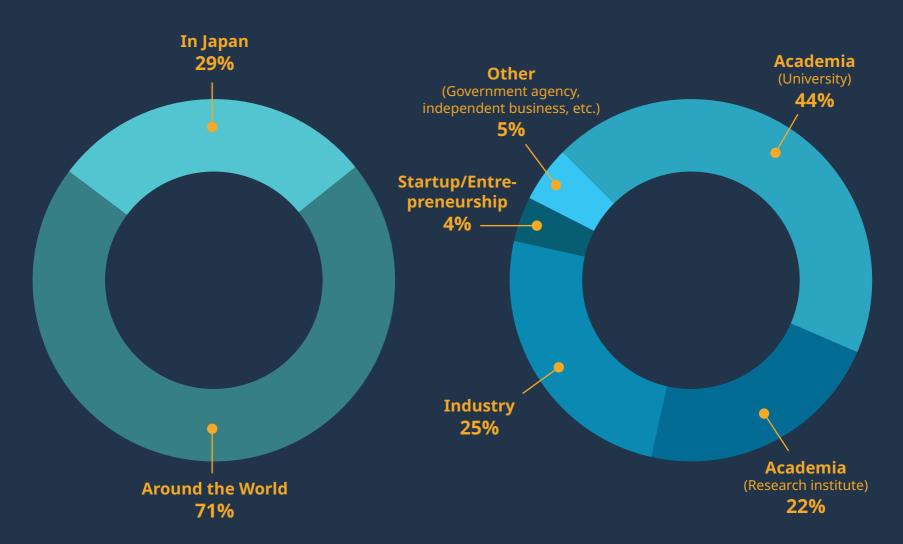
— Margaret Mars Brisbin, PhD '20, Assistant Professor, University of South Florida College of Marine Science



"Since graduating from OIST, I've been working for a neurotech startup in Tokyo to study human well-being and develop neurotech infrastructure for promoting it. My OIST education set me apart in a competitive market because PhDs are practiced in opening up new frontiers by creating knowledge and embracing challenges in the process."

— Hiro Hamada, PhD '19, Chief Researcher, ARAYA

#### **Alumni Employment and Career Paths**



Data collected Sep. 2017 through May 2024.



OIST is dedicated to transforming fundamental science into real-world solutions. fostering innovation and entrepreneurship for the benefit of Okinawa, Japan, and beyond. Through various programs, we connect our students, scientists, and entrepreneurs with commercialization practices, mentors, funding opportunities, and advanced technologies, creating an innovative environment that bridges the gap between research and market application.

We are cultivating an interconnected ecosystem in Okinawa that fuels innovation by integrating OIST research with local businesses, national networks, and the global landscape. Notably, **25%** of all startups in Okinawa have originated from OIST research and activities, highlighting our pivotal role.

#### **Proof-of-Concept Program**

The POC Program is a competitive funding initiative for OIST researchers to transform their ideas into new products and services that benefit society. A key feature is the Technology Pioneer Fellowship, a two-year fellowship that equips entrepreneurial scientists with the skills, resources, and network to create significant societal impact through their research and innovations (*see below*). Bridging the gap between academia and industry, the POC Program cultivates a new generation of scientific leaders ready to address global challenges and propel technological advancements in fields ranging from medical devices to wastewater treatment, quantum technologies, and cancer therapy.

#### **OIST Innovation Accelerator**

Our Accelerator is an entrepreneurship training program, competition, and startup incubator. As Okinawa's first global startup accelerator, we welcome innovators from around the world to build their businesses at OIST, using our platform as a gateway to Japan. We offer funding opportunities, personalized coaching and mentoring, investor and business connections, peer support, and access to the university's state-of-the-art lab facilities and equipment. We host **12** teams a year for a bootcamp, with the aim of keeping **four** on campus for up to a year. To date, the program has yielded **ten** startups that continue to operate their businesses from Okinawa.

#### **OIST-Lifetime Ventures Fund**

The Fund is a seed-focused venture capital fund managed by Lifetime Ventures with a targeted size of **¥5 billion**. The Fund has access to world-class technologies and entrepreneurs from OIST and its extensive global network. Focused on deep tech solutions in sectors like health-tech and sustainability, the Fund aims to catalyze the development of science-based technologies towards better human and planetary health.



#### **Technology Pioneer Fellowship**

Fellow Viktoras Lisicovas developed an innovative femtosecond laser-based system that offers a safer and more effective way to remove blood vessel blockages and treat heart disease. The technology eliminates the need for abrasive tools and enhances plaque removal while minimizing tissue damage. This approach will reduce inflammation, accelerate patient recovery, and lower the risk of plaque recurrence.



OIST's outreach efforts are multifaceted. encompassing science education to enhance public understanding and appreciation of basic science, among other initiatives. We connect students and adults to the exciting world of science and technology through many yearround outreach activities. At the same time. we are building a robust innovation network, facilitating collaborations between researchers, entrepreneurs, and the private and public sectors to foster technological and economic growth. Through on- and off-campus programs, events, partnerships, and research projects, we foster connections that promote educational, industrial, and scientific collaboration in Okinawa and beyond.



**270,530** outreach participants since our founding

**28,000** campus visitors per year

**1,500** Super Science High School participants this year

Impactful Outreach

#### **Science Education**

OIST strives to be a leading hub of science education, dedicated to enriching Okinawa and Japan. We engage children, youth, and families in science and the scientific method through active participation in diverse activities. Our outreach activities harness inherent curiosity, providing firsthand experiences in advanced, interdisciplinary scientific research. By developing skills necessary for informed, culturally connected, and evidencebased decision-making, we enhance public understanding and responsibility. Our initiatives include campus tours. Super Science High School programs, an annual open house, public lectures, film screenings, hackathons, summer camps, cultural activities, and more.

#### Startups and Industry

OIST's outreach includes programs designed to connect researchers, entrepreneurs, and public and industry partners. We are creating a dynamic innovation ecosystem around the university by fostering collaborations between startups, seasoned companies from Japan, and international players. For instance, we facilitate connections through our incubator and with OIST's industry-affiliated network (INO) by hosting targeted events, workshops, and networking sessions. These initiatives have led to knowledge transfer, human resource exchanges, and fruitful partnerships in technology development.

#### **Research and Technologies**

OIST is working to combine scientific innovation with efforts to address local needs with global impact. Our researchers apply their expertise in areas such as genomics, marine science, plant science, and engineering to vital local resource issues, from preserving the island's forests and coral reefs to boosting local agriculture and aquaculture.

Projects include partnering with local farmers to grow a new rice variety with digestion-resistant starch, assessing coral biodiversity through environmental genomics analysis, supporting the fishery community through increased resilience to climate impacts, developing technology to support *Bashofu* craftsmanship, and developing mobility and sustainable energy solutions for the prefecture.

#### OIST STEM Experience, Exploration, and Discovery Program

The OIST SEED Program was created for science-oriented high schools across Japan. This initiative aims to spark student interest in science and technology and enhance their research skills for future studies. Participants engage in activities in English and interact with OIST's diverse community of students, researchers, and staff. The program deepens understanding of scientific concepts through research introductions, campus and lab tours, and lectures.

#### Sustainable Energy Testbed

The Testbed is a partnership between the public sector, private sector, and universities that establishes a living laboratory for sustainable energy research and development in Okinawa. This "collaboratory" allows companies and researchers to test advanced technologies in real-world conditions, addressing island communities' unique energy challenges, such as vulnerability to natural disasters and the need for energy independence. Focusing on island challenges in energy production and management, next-generation batteries, transportation and logistics, and carbon capture/reuse, this collaborative model aims to develop energy and mobility solutions for Okinawa and support Japan's goal of reaching net zero by 2050.



At OIST, advancing science and nurturing our community are intertwined. We strive to create an inclusive and welcoming environment by offering programs to support relocation and enrich life at OIST and throughout Okinawa.

#### **Resource Center**

Our Resource Center provides comprehensive daily life support to the entire OIST community, including family members. The Center offers free essential assistance for various needs — from healthcare referrals to banking information, cell phone options, and driver's license conversion.

#### **Child Development Center**

Our on-campus bilingual childcare provides early childhood education for children ages 0–6 years and an after-school program for elementary-aged children. The CDC supports the growth of happy, healthy, and socially confident children through a curriculum inspired by their interests and creativity. More than 220 OIST children currently attend these programs.

#### **Ganjuu** Wellbeing Service

*Ganjuu*, our bilingual counseling and mental wellness center, offers free support to our staff, students, and family members. Named after the Okinawan word for "good, strong, and healthy,"

*Ganjuu* is dedicated to nurturing these essential qualities by helping our community members navigate challenges from health issues to interpersonal relationships.

#### **Language Education**

OIST serves a diverse community, many of whom do not speak English or Japanese as their first language. We offer free Japanese and English language courses to support their daily lives and facilitate communication both within and outside OIST.

#### Clubs

OIST hosts many clubs that are open to all members of the OIST community, including family members. Clubs include Aerial Skills, Beach Cleanup, Big Lungs Music OISTers Band, Bike Share, Board Games and Video Games, *Capoeira*, Climbing, ECO (Environmentally Conscious OISTers), Gardening, *Haarii* (Dragon Boat), *Hokulani* Music Club, *Iaido*, Kickboxing, Knitting and Crafts, LGBTQ Allies, Light Music, POWER (Promotion of Okinawa's Welfare, Economy, and Resources), Ultimate Frisbee, and Woodworking.

In addition to these services and activities, we also have a relocation team to help with settling in Okinawa, as well as a health clinic, convenience store, gym, laundromat, multi-purpose rooms, and community kitchens to support daily life on campus.





