

# OIST vision, plan and current efforts towards the 2021 review

## 10年後見直しに向けたOISTの計画と現状について

A presentation to the 15<sup>th</sup> External Panel on Future Challenges for OIST

沖縄科学技術大学院大学学園の今後の諸課題に関する検討会（第15回）

September 18, 2018



## The Basic Policy on Economic and Fiscal Management and Reform 2018 (Big-Boned Policy)

Approved by the Cabinet on June 15, 2018 (An Excerpt)

(Development of Okinawa)

The policy also calls for human resource development and a productivity revolution. To achieve these goals, measures such as to expand the **Okinawa Institute of Science and Technology Graduate University to make it an international hub for science, technology, and innovation**, to develop human resources focusing on IT and manufacturing sectors, to provide improved English educational programs through cooperation with the United States, and to address the profound issue of child poverty, will be implemented.

# 経済財政運営と改革の基本方針2018（骨太の方針）

平成30年6月15日 閣議決定（抜粋）

（沖縄振興）

また、科学技術・イノベーションの国際的拠点を目指した沖縄科学技術大学院大学の規模拡充とともに、ITやものづくりの中核を担う人材の育成、米国の協力を得た英語教育の充実、深刻な子供の貧困への対策などにより、沖縄における人づくり革命と生産性革命を実現する。



## OIST in a Nutshell

Our goal is to bring together the best scientists from around the world to produce the **highest quality research**. This research will help to educate leaders of tomorrow and allows **innovations** and **technology transfer** that can compete on a global scale, while contributing to the development of Okinawa and the local economy.

# Outline

- Overview and brief history of OIST
- Excellence in Research
- Excellence in Education
- Excellence in Innovation
- External funding
- Plans for growth
- Roadmap towards 2021



## OIST Graduate University



**Who we are:** The Okinawa Institute of Science and Technology is an interdisciplinary research university offering a 5-year PhD program in science. Over half of the faculty and students are recruited from outside Japan, and all education and research is conducted entirely in English

沖縄科学技術大学院大学（OIST）は5年一貫制の博士課程を置く大学院大学です。教員と学生の半数以上を外国人とし、教育と研究は全て英語で行います。OISTの教育研究活動は学際的で先端的なものです。

**Mission Statement:** The OIST Graduate University shall conduct internationally outstanding education and research in science and technology, and thus contribute to the sustainable development of Okinawa, and promote and sustain the advancement of science and technology in Japan and throughout the world.

**設立目的:** 沖縄科学技術大学院大学は、国際的に卓越した科学技術に関する教育及び研究を実施することにより、沖縄の自立的発展と、世界の科学技術の向上に寄与することを目的としています。

# What makes OIST unique

- Operational principles resembling leading western universities
- Operational language: English
- International: Over 60% of faculty are non-Japanese
- Interdisciplinary: cross-disciplinary research and education
- Education: 2:1 student to faculty ratio
- Funding: OIST is a Special Private School Corporation, funded mostly by the Japanese government: **high trust funding for creative research!**
- OIST is committed to accelerating the economic growth of Okinawa and Japan through industry partnerships and entrepreneurship
- Location: Okinawa is a beautiful sub-tropical island in the center of Asia's rapid economic development

## OIST - a young university with a short, but excellent, history

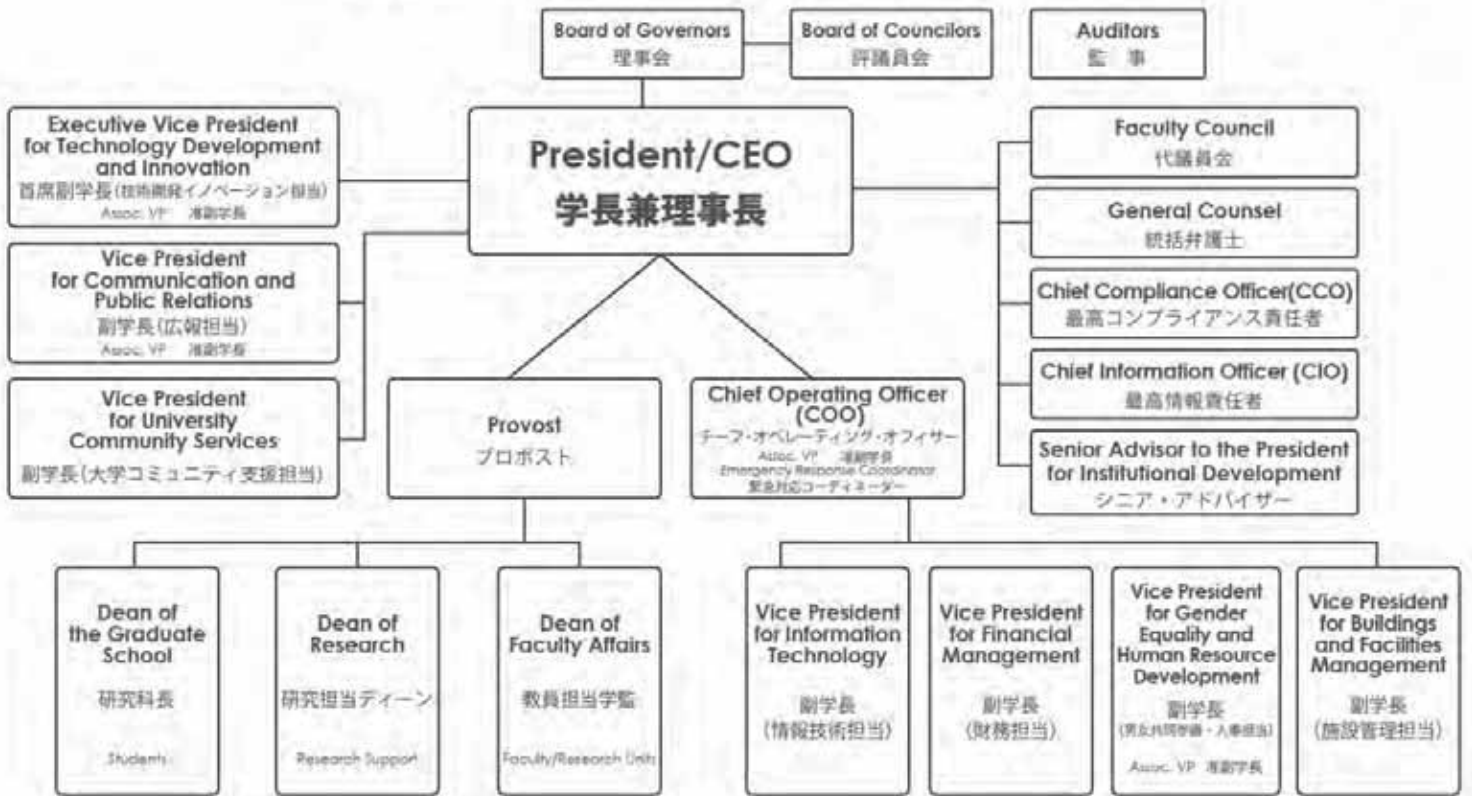


沿革：創立間もない大学だが、卓越した業績を上げている



# OIST School Corporation Organization

## 学校法人沖縄科学技術大学院大学学園組織図



## Board of Governors

|                      |                    |                        |                   |                                |   |
|----------------------|--------------------|------------------------|-------------------|--------------------------------|---|
|                      |                    |                        |                   |                                |   |
| Dr. Cherry Murray    | Dr. Akito Arima    | Dr. Yoko Aniya         | Dr. Curtis Callan | Dr. Rita Collwell              | Dr. Senapathy Gopalakrishnan  |
|                      |                    |                        |                   |                                |   |
| Dr. Jerome Friedman* | Dr. Serge Haroche* | Dr. Kazuhito Hashimoto | Dr. Motoko Kotani | Dr. VijayRaghavan Krishnaswamy | Dr. Kiyoshi Kurokawa  |
|                      |                    |                        |                   |                                | + OIST President and CEO Peter Gruss and OIST Executive Vice President and Vice-CEO Robert Baughman |
| Dr. Yuan T. Lee*     | Dr. Erwin Neher*   | Dr. Ryoji Noyori*      | Mr. Koji Omi      | Dr. Albrecht Wagner            | * denotes Nobel Laureates   |



# Board of Councilors

## Employees of the Corporation

Mary Collins      Keisuke Yoshio      Keiji Takanashi  
Machi Dilworth      Ali Ganjehlou      Emi Matsushima  
Erik De Schutter      Gail Tripp  
Milind Purohit      Ulf Skoglund

## Persons vested in the economy and society of Okinawa

Moritake Tomikawa      Yoko Aniya      Eriko Wauke  
Yoshimi Nagahama      Fuji Takayasu      Hideo Yamasaki  
Robert Nakasone      Masaki Masudo  
Yoshihisa Kawakami      Irene Hirano

## Representatives from the university

Albrecht Wagner      Keith Hodgson      Ken Peach  
Ryo Matsumoto      Yoshiharu Doi  
Frederick Gilman      Lee James O'Riordan

## Persons with superior insight into the fairness and transparency of university management

Akito Arima      Monte Cassim      Ralph Eichler  
Ryo Hirasawa      Tisato Kajiyama      Katsuhiko Shirai

## Persons with leadership experience or extensive public service in organizations other than universities

Nobuaki Tanaka      Phillip Yeo      Reiko Miura-Ko      David Swinbanks      Jürgen Zöllner      Nasser Kazeminy



**OIST developed an integrated research, education and innovation strategy**



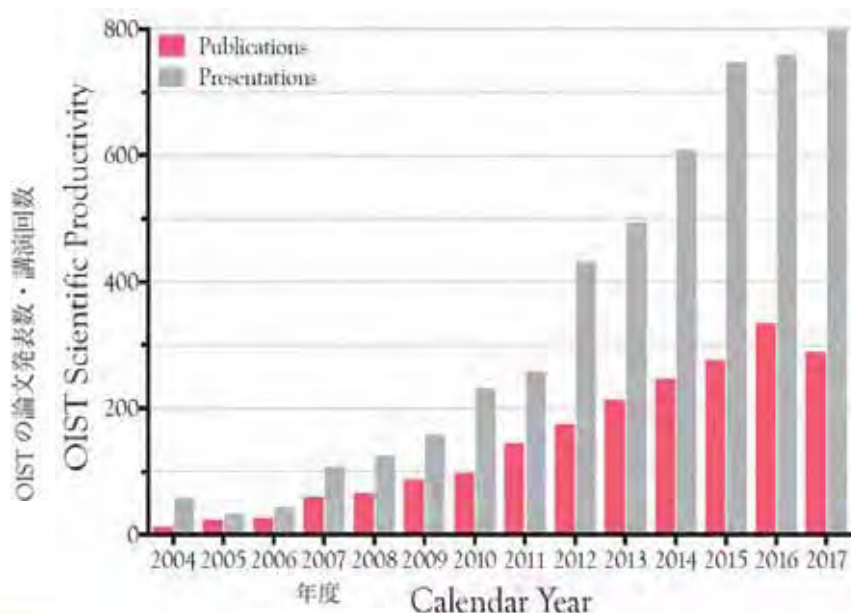
# Outline

- Overview and brief history of OIST
- **Excellence in Research**
- Excellence in Education
- Excellence in Innovation
- External funding
- Plans for growth
- Roadmap towards 2021



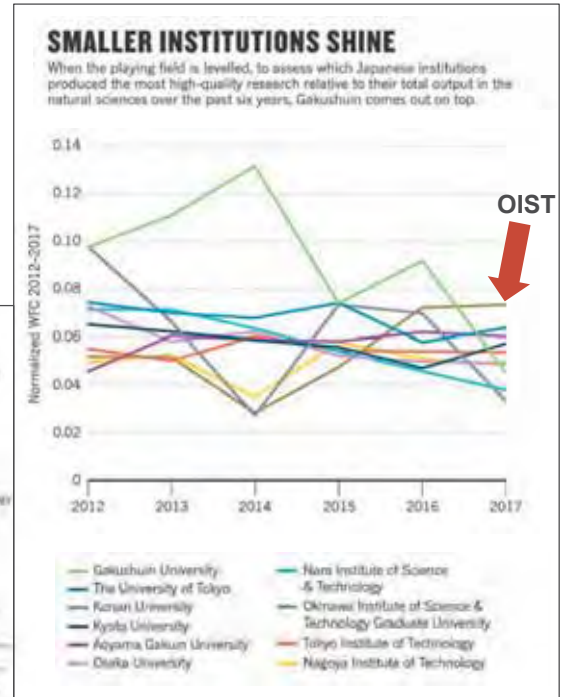
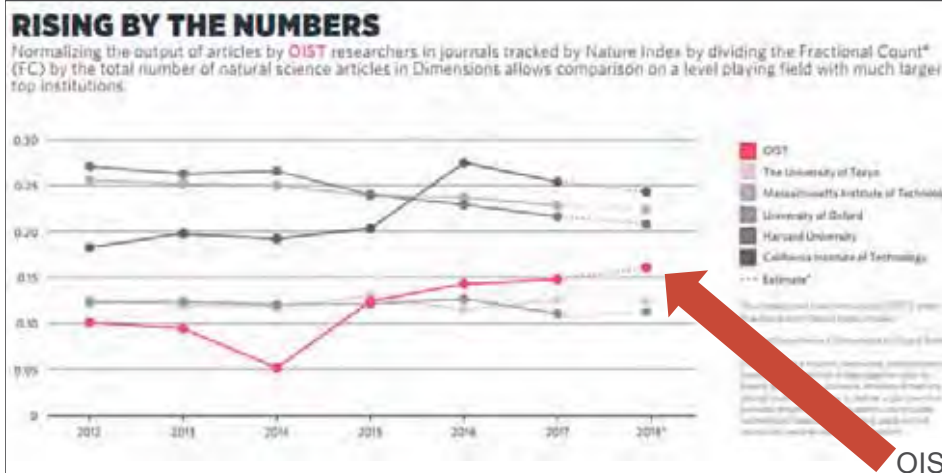
## Scientific Impact 研究成果

- ~14,000 publications, books, and presentations made by OIST researchers.
- およそ計14,000の出版、発表がOIST研究員によって行われた。



# ネイチャーインデックス2018日本版

- ネイチャーインデックス2018において、平成24年から平成29年に発表された高品質な科学論文の国内平均値ランキングでOISTは8位。
- 平成26年以降、高品質な科学論文に占めるOISTからの論文の割合は安定的に増加している。
- 平成29年、高品質な研究論文のランキングでOISTは1位。

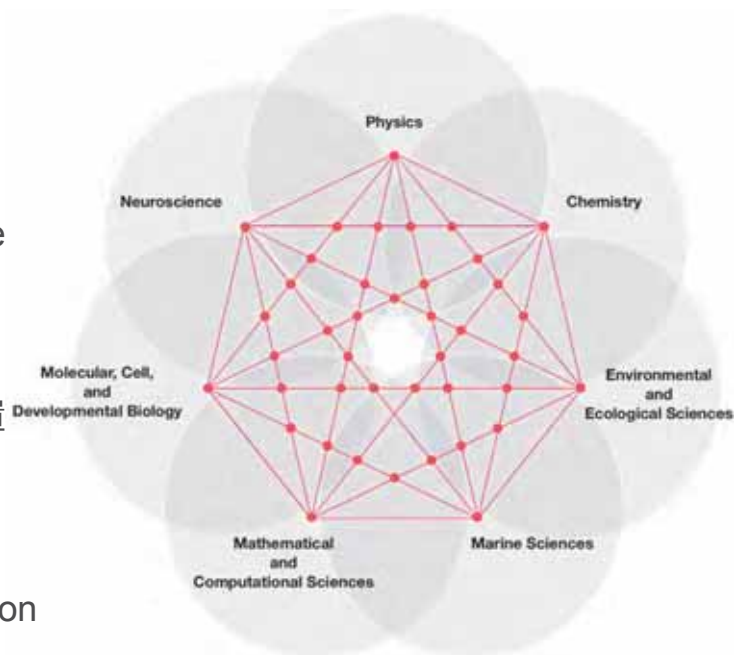


OIST is already amongst the global elites in terms of quality!

Source: *Nature* 555, S54-S55 (2018)

## Environment Optimized to Promote Cross-Disciplinary Research 学際的研究に最適な環境

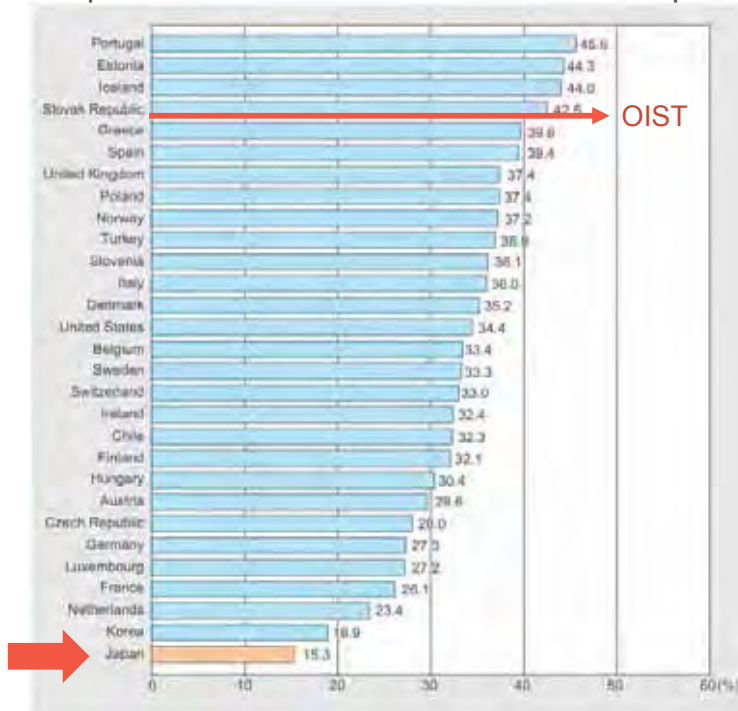
- OIST has no academic departments  
学部の壁の無い組織（単一の研究科・専攻）
- Assignment of office and laboratory space prevents partitioning of researchers by disciplines  
-- they must mix  
分野の垣根を越えたオフィス及び研究室の配置  
-- 研究者間の交流を促進
- Strong emphasis on shared and common equipment -- free access to instrumentation by all  
研究機器・設備の共同利用を促進  
-- 全研究員が自由に研究機器・設備を利用





# Gender Equality at OIST

Proportion of Female Researchers Low in Japan



OIST Employees (as of May 2018)

|                        | Japan | Intl. | % of Women | Total |
|------------------------|-------|-------|------------|-------|
| Faculty                | 22    | 35    | 21%        | 57    |
| Research Units Staff   | 198   | 240   | 43%        | 438   |
| Research Support Staff | 65    | 16    | 43%        | 81    |
| Administrative Staff   | 261   | 50    | 62%        | 311   |

OIST Students (as of May 2018)

|          | Total | % Japan | % Women |
|----------|-------|---------|---------|
| Students | 156   | 16%     | 40%     |



Source: "Men and Women in Japan 2017". Gender Equality Bureau Cabinet Office.

## RECENT FACULTY RECRUITS 新任教員

### Molecular and Cell Biology

生物学

Tom Bourguignon



Keiko Kono  
河野 恵子

Paola Laurino

Simone Piglotti

### Physics

物理学

Yejun Feng

Akihiro Kusumi  
楠見 明弘

Yasha Neiman

Yoshinori Okada  
岡田佳憲

Fabian Pauly



### Neuroscience

神経科学

Izumi Fukunaga  
福永泉美

Marylka Yoe Uusisaari

Jun Tani  
谷 淳



### Mathematics

数学

Anastasiia Tsvietkova



# Research Highlights 研究ハイライト



**CAPTURING ELECTRON MOVEMENT**  
電子の動きを捉える

Researchers in the Femtosecond Spectroscopy Unit, led by Prof. Keshav Dani, combined a femtosecond laser and an electron microscope into a powerful system that captures both the time and spatial scale of the motion of electrons.

ケシャブ・ダニ准教授率いるフェムト秒分光法ユニットの研究者らがフェムト秒レーザーと電子顕微鏡を組み合わせたパワフルな装置を用い、電子の動きの時間的・空間的動きを捉えることに成功。



**SUPRAMOLECULAR ASSEMBLIES**  
超分子集合体

Prof. Ye Zhang and the Bioinspired Soft Matter Unit recently published their work on molecular scaffolds inspired by the extracellular matrix in *Angewandte Chemie International Edition*.

生体模倣ソフトマターユニットとイェ・ジャン准教授が、細胞外のマトリックスに触発された分子足場のついでの研究を「国際版応用化学」誌に発表



**ROBOT LEARNING** ロボットによる学習

The Neural Computation Unit, led by Prof. Kenji Doya, investigates how robots can utilize simulation, similar to humans, to learn faster. Prof Doya is leading the Kakenhi project “Correspondence and Fusion of Artificial Intelligence and Brain Science”

銅谷賢治教授率いる神経計算ユニットは、人間と同様にロボットがシミュレーションを利用しながら、いかに早く学ぶことができるかを研究中。銅谷教授は科研費を用い、「人工知能と脳科学の対照と融合」というプロジェクトを進行中



See the new [OIST Brochure](#) for more success stories

# Research Highlights 研究ハイライト



**ENERGY FROM THE OCEAN**  
海からのエネルギー

Professor Tsumoru Shintake and the Quantum Wave Microscopy Unit reach for a clean future with energy powered by ocean waves.

新竹積教授率いる量子波光学顕微鏡ユニットでは、海の波の力を利用したクリーンなエネルギーを開発中



**ADVANCED SOLAR CELLS**  
次世代太陽電池

Prof. Yabing Qi and the Energy Materials and Surface Sciences Unit work to improve the lifespan, performance and production of perovskite solar cells.

ヤビン・チー教授率いるエネルギー材料と表面科学ユニットでは、ペロブスカイト太陽電池の耐用年数、性能、製造工程を改良すべく研究中



**NEW BIOSENSORS**  
新たなバイオセンサー

Researchers in the Micro/Bio/Nanofluidics Unit, led by Prof. Amy Shen, conduct fundamental research to develop a wide range of biosensors and other devices.

エイミー・シェン率いるマイクロ・バイオ・ナノ流体ユニットでは、広範囲に用いられるバイオセンサーやその他の装置の開発のため、基礎研究を続行中



See the new [OIST Brochure](#) for more success stories

# Research Highlights 研究ハイライト



## OIST CHILDREN'S RESEARCH CENTER OIST子供研究センター

The Children's Research Center, led by Prof. Gail Tripp, aims understand the causes of Attention Deficit Hyperactivity Disorder (ADHD) to help aid treatment for children. Researchers in the Center have advanced degrees and licenses in psychology and are experienced working with children.

ゲイル・トリップ教授率いる子供研究センターでは、注意欠陥多動性障害（ADHD）の原因を理解することを目的としながら、子供たちの治療をサポートしています。当センターには、心理学分野で博士号やライセンスを持つ研究員が複数おり、子供達への対応において豊富な経験を持つ。



## OKEON PROJECT OKEONちゅら森プロジェクト

Prof. Evan Economo leads the Okinawa Environmental Observation Network (OKEON) project to monitor the terrestrial environment of Okinawa, involving researchers at OIST, collaborators a various institutions, museums and high schools across Okinawa, and the local community.

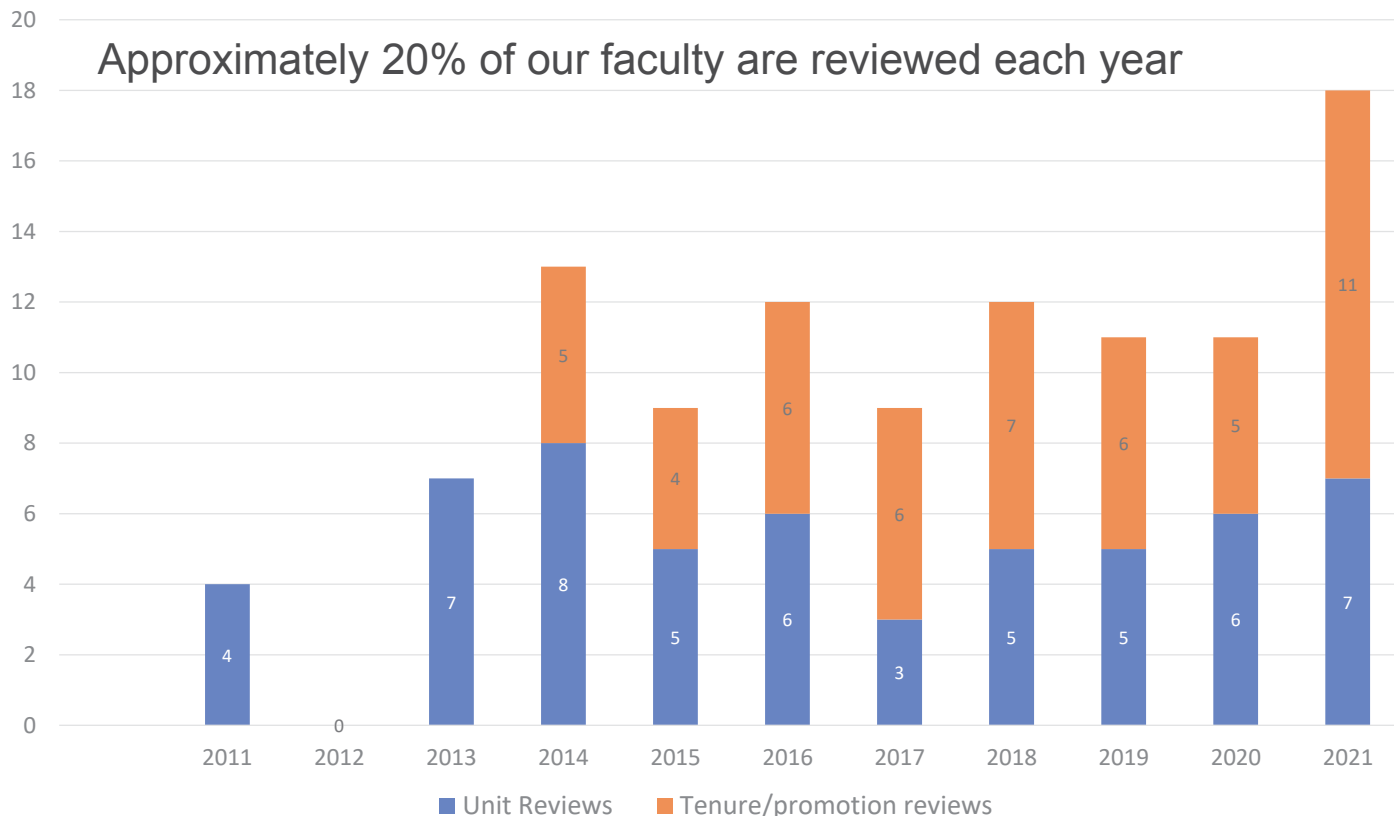
エヴァン・エコノモ准教授は、OKEONちゅら森プロジェクトを統括し、OIST研究員、諸機関、博物館、沖縄県内の高校や地域社会と協働しながら、沖縄の陸上環境のモニタリングを行っている。



See the new [OIST Brochure](#) for more success stories

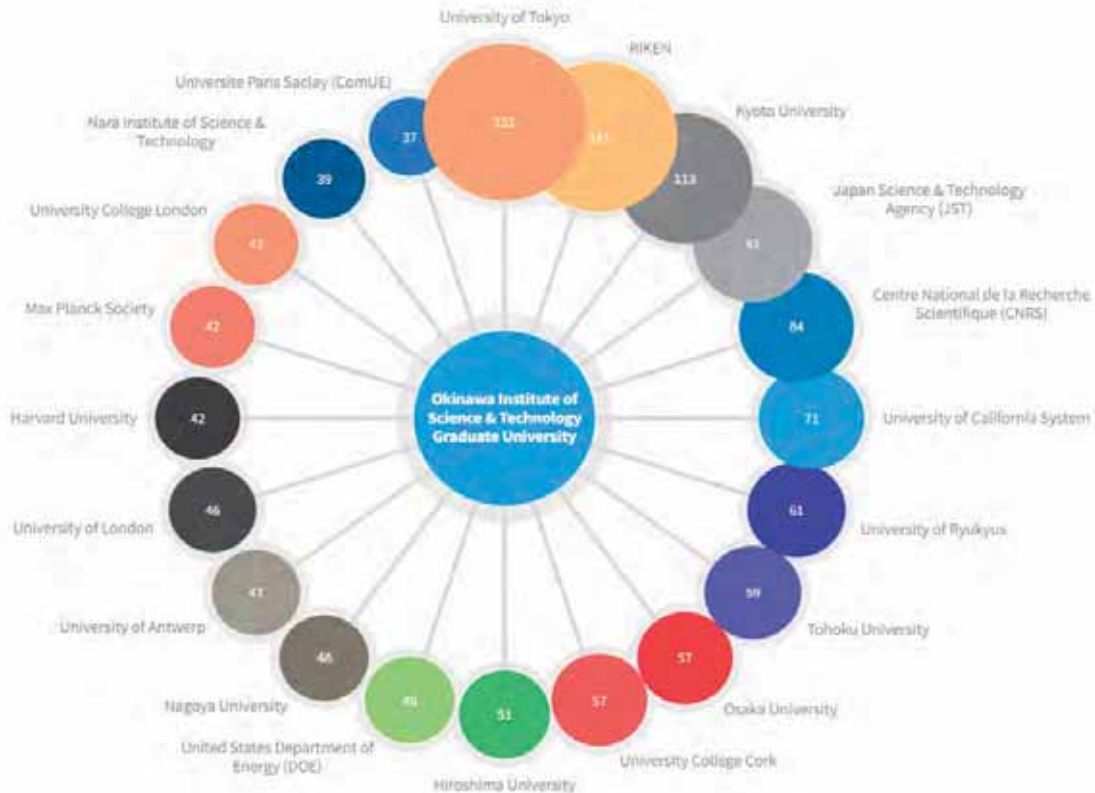
## Faculty Reviews per year

Approximately 20% of our faculty are reviewed each year



# Collaborations are actively encouraged

Number of co-authored publications with collaborators outside of OIST  
他大学との連携を積極的に推進: 学外研究者との共著論文数



InCites dataset updated Jul 28, 2018. Includes Web of Science content indexed through May 31, 2018.

## Promoting partnerships: “KICKS” and “JUMPS”

### OIST Kick Start Funds

- Internal, competitive program designed to provide support for new collaborative research
- Funding: 10M Yen per year per project
- Number of awards: 5 per year
  - Fund destinations:
    - **Japan:** Kyoto University, Tohoku University, RIKEN
    - **USA:** UC Berkeley, Iowa State
    - **Germany:** Trier U
    - **Brazil:** IDOR
    - **Taiwan:** National Chiao Tung University

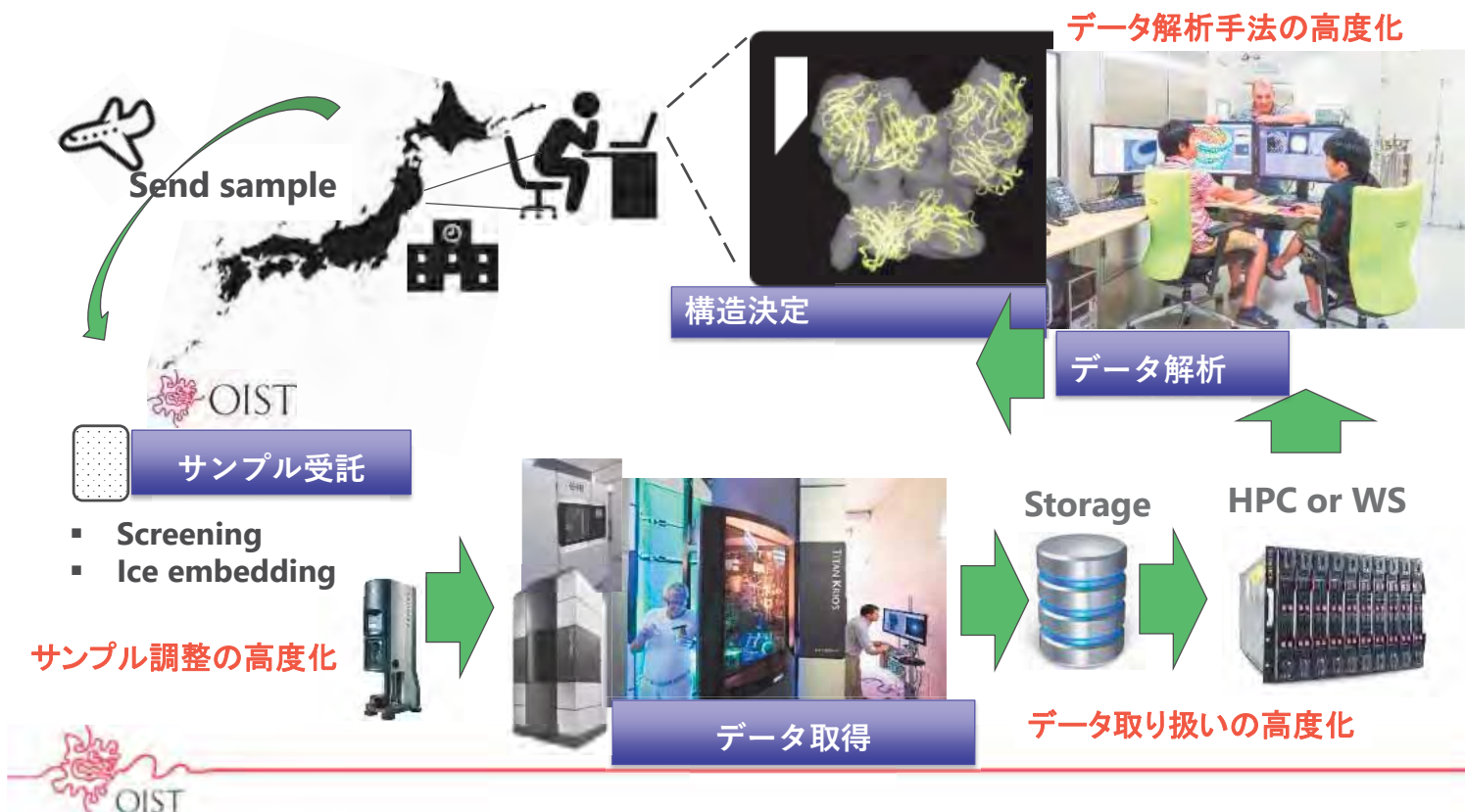
### Jump-start Networking in Japan

- Provides funds for Japanese researchers to collaborate with the OIST Research Support Division and use OIST facilities
- Funding: up to 1M yen per project per year
- Number of awards: up to 10 per year

# 創薬等先端技術支援基盤プラットフォーム



クライオ電顕によるタンパク質構造解析支援と技術の高度化



## Basis of structural analysis support at OIST OISTにおける構造解析支援の基盤

### タンパク質構造解析の技術 1. Protein Structural Analysis



トモグラフィー法  
**Cryo-EM Tomography**  
Prof. Ulf SKOGLUND



Dr. Lars-Goran OFVERSTEDT



単粒子解析法  
**Single Particle Analysis**  
Prof. Matthias WOLF



単粒子解析アルゴリズム開発  
**Algorithm Development**  
Dr. Kun-Yi HSIN

### クライオ電子顕微鏡の設備 2. Cryo-electron Microscope



**Titan Krios**  
(300keV)



**Talos Arctica**  
(200keV)

### 研究支援体制 3. Research Support



**Principal Investigator** 研究代表者  
Dr. Bruno HUMBEL  
Imaging Section Leader



Dr. Mary COLLINS  
Dean of Research



Dr. Mizuki SHIMANUKI  
Research Resources Manager



Dr. Eddy TAILLEFER  
Scientific Computing & Data  
Analysis Section

### Resources added to OIST by the AMED funding

AMEDからの資金によって  
OISTに追加された研究資源

Electron microscope 電子顕微鏡



**Talos L120C**  
(120keV)  
March, 2018

EM Staff 電子顕微鏡スタッフ



Dr. Ryo KANNO  
Cryo-EM specialist  
April, 2018



Dr. Malgorzata HALL  
Cryo-EM specialist  
June, 2018

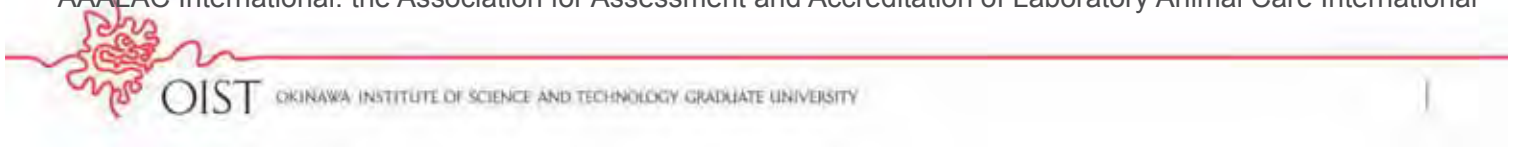


# Peer reviews of research support sections

All sections will receive peer review by the end of FY2019

| Timing    | Section  |
|-----------|--|
| Jul 2014  | Animal Resources Section<br>(As a part of accreditation of AAALAC International)                                     |
| Jul 2016  | Okinawa Marine Science Support Section<br>(As a part of OIST International Advisory Board meeting on Marine Science) |
| Nov 2016  | Scientific Computing & Data Analysis Section   |
| Jun 2017  | DNA Sequencing Section   |
| Jul 2017  | Okinawa Marine Science Support Section (Same as above)   |
| Sep 2018  | Okinawa Marine Science Support Section (Same as above)   |
| Dec 2018  | Mechanical Engineering & Microfabrication Support Section  |
| Jan 2019  | Instrumental Analysis Section  |
| Late 2019 | Imaging Section  |

\*AAALAC International: the Association for Assessment and Accreditation of Laboratory Animal Care International



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# Education 教育

- Students are required to rotate through a lab outside of their primary research interests to foster an interdisciplinary mindset
- 学際的思考力を身に付けるため、専門分野以外の科目を受講するラボ・ロテーションが義務付けられている
- Students are required to take professional development courses to broaden their horizons and tackle challenges outside the lab
- 視野を広げ現実的な課題解決能力を身に付けるため、プロフェッショナル・ディベロップメント科目を全学生が受講
- Entrepreneurship courses and workshops are offered through our Technology Development and Innovation Center
- 本学の技術開発イノベーションセンターにおいて、起業に関する講義やワークショップを提供している



## Student numbers and graduates 2012-2019

|             | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|-------------|---------|---------|---------|---------|---------|---------|---------|
| Applied     | 208     | 398     | 231     | 294     | 441     | 386     | 502     |
| Interviewed | 80      | 72      | 71      | 86      | 88      | 82      | 114     |
| Offered     | 49      | 41      | 40      | 54      | 56      | 48      | 60      |
| Enrolled    | 34      | 20      | 27      | 24      | 35      | 37      | 35      |
| Graduates   | -       | -       | -       | -       | 7       | 13      | -       |







# 1st OIST GRADUATION 卒業式

24 February 2018

2018年2月24日

First graduation ceremony brought together government and industry VIPs with students and their families from Japan and around the world.

Honorary Degree awarded to Mr. Koji Omi, a key figure in establishing OIST

Commencement address by Nobel Laureate and former BOG Member, Dr. Steven Chu.

初めての卒業式では、政府や産業界の主賓の方々、学生と国内外から訪れた彼らの家族らが一堂に会しました。

OIST創立の中心人物の一人、尾身幸次氏に名誉学位を贈られた。

ノーベル賞受賞者で元OIST理事のスティーブン・チュー博士よりお祝いの言葉をいただく。

**Dr. Steven Chu**

*1996 Nobel Prize in Physics*

スティーブン・チュー博士  
1996年ノーベル物理学賞



## 1st OIST GRADUATES 第一期卒業生

**Mark Daly**  
**Lee James O'Riordan**  
**Faisal Mahmood**  
**Märt Toots**  
**Dongxin Zhang**

**Yi-Jyun Luo**  
**Kenneth Baughman**  
**Rico Pohle**  
**Zafer Hawash**  
**Caroline Starzynski**

**Cong Liu**  
**Nino Espinas**  
**Keita Ikegami**  
**Daisuke Takahashi**

**Of 20 that have graduated to date:**

### **Postdoctoral positions at universities: 7**

- ✓ Harvard University, USA x 2
- ✓ Johns Hopkins University, USA
- ✓ The University of Tokyo, Japan x 2
- ✓ Karlstad University, Sweden
- ✓ University of the Ryukyus, Japan

### **Private industry- for profit: 2**

- ✓ Twilio, Tallinn, Estonia
- ✓ Nature publishing, London, UK

### **Postdoctoral positions at national labs/research institutes: 3**

- ✓ Lawrence Berkeley National Lab, USA
- ✓ JSPS Postdoctoral Fellow, RIKEN Center for Sustainable Resource Science, Japan
- ✓ Inria, France

### **OIST Junior Research Fellow: 4**

### **Still deciding/not known: 4**



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## OIST model for innovation

Our goal is to bring together the best scientists from around the world to produce the **highest quality research**. This research will help to educate leaders of tomorrow and allows **innovations** and **technology transfer** that can compete on a global scale, while contributing to the development of Okinawa and the local economy.



# Technology Development and Innovation Center

## FOSTER INNOVATION AT OIST AND IN OKINAWA TO ACCELERATE SELF-SUSTAINING ECONOMIC GROWTH

TDIC achieves this mission by conducting 8 wide-ranging activities in 3 strategic areas:

|  |   |
|--|---|
| <b>INTELLECTUAL PROPERTY</b>                                 | <ul style="list-style-type: none"><li>Identify and patent research discoveries</li><li>Conduct technology transfer by marketing and licensing patents</li></ul>   |
| <b>TECHNOLOGY DEVELOPMENT RESEARCH</b>                       | <ul style="list-style-type: none"><li>Expand research sponsorship through collaborations with industry</li><li>Enhance the OIST Proof-of-Concept Program to drive inventions towards commercialization</li></ul>  |
| <b>ENTREPRENEURSHIP &amp; INNOVATION ECOSYSTEM PROMOTION</b> | <ul style="list-style-type: none"><li>Foster entrepreneurship through educational courses, seminars</li><li>Support the creation and incubation of startup companies</li><li>Strengthen regional, national, and international partnerships with public-private sector to develop the innovation ecosystem</li><li>Understand the components and indicators of successful innovation in science and technology</li></ul> |



L. Ha & R. Baughman

## TDIC MISSION | 目的

### OISTと沖縄のイノベーションを育成し自立的な経済成長の加速

TDICでは3つの戦略分野より8項目の幅広い活動を行うことで目的を達成します

|                                      |   |
|--------------------------------------|---|
| <b>知的財産</b>                          | <ul style="list-style-type: none"><li>発明の同定と特許化</li><li>特許の市場化とライセンス契約による技術移転</li></ul>   |
| <b>先進技術研究</b>                        | <ul style="list-style-type: none"><li>企業との共同研究を通して研究支援を拡大</li><li>発明の商業化推進に向けてPOCプログラムを強化</li></ul>   |
| <b>起業家育成 &amp; イノベーション・エコシステムの推進</b> | <ul style="list-style-type: none"><li>トレーニング、セミナーを通じて起業家精神を育成</li><li>スタートアップ企業の設立、運営支援</li><li>イノベーション・エコシステムの展開に向けて沖縄、日本さらに海外の民間部門との連携強化</li><li>科学技術におけるイノベーションの成功の指標要素を理解</li></ul> |





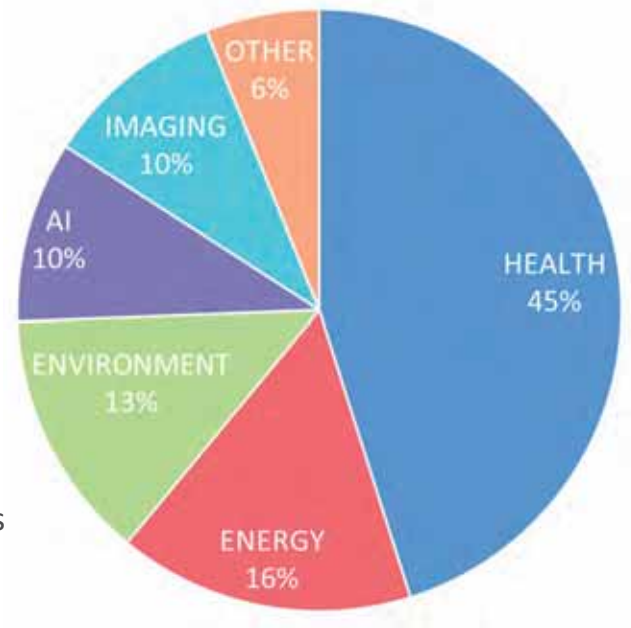
## PATENTS: IP ASSETS

**326** Patent applications filed since 2004

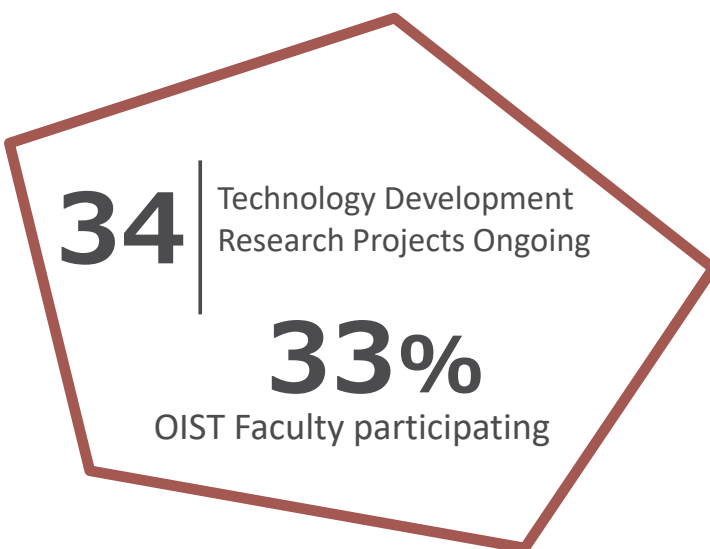
**81** Patents awarded as of Sep 2018

**85%** Application-to-Patent success rate

- Health-related IP includes medical devices, biosensors, chemical synthesis, analytical methods
- Energy and Environment IP are increasing



TDIC supports a range of technology development research projects



### PROOF-OF-CONCEPT RESEARCH

Pre-commercialization studies to establish feasibility and identify market applications (ITR, Phase I/II)

### CO-DEVELOPMENT WITH INDUSTRY PARTNERS

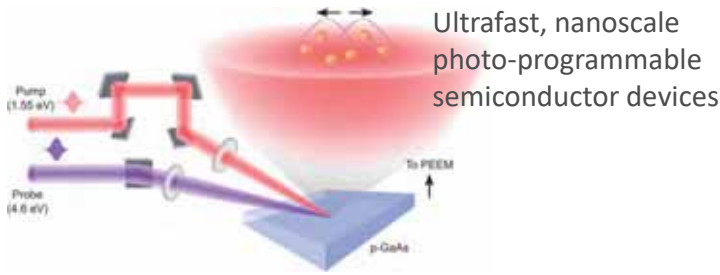
Academic-Industry collaborations to develop new technologies that meet specific market needs





Technology Development & Innovation Center

# TECHNOLOGY DEVELOPMENT RESEARCH

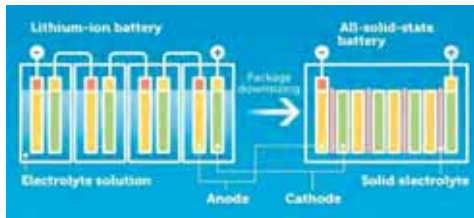


Ultrafast, nanoscale photo-programmable semiconductor devices



Developing synthetic polypeptides to control the outbreak of crown-of-thorns starfish in coral reefs

## NEW POC PROJECTS (2018) Innovative Technology Research



All-solid-state Li-ion batteries with improved stability



Evaluating the effectiveness of a parenting program for Japanese mothers of children with ADHD



Technology Development & Innovation Center

# TECHNOLOGY DEVELOPMENT RESEARCH

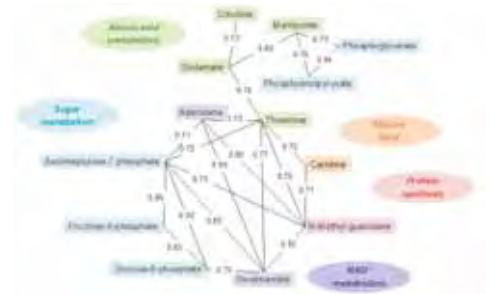


Portable nanoplasmonic device for biomedical applications in the field



Combined mass- and ion-mobility spectrometry to identify novel chemical structures

Metabolic biomarkers of aging

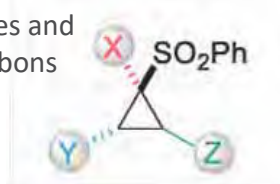


New variety of rice with non-digestible starch, adapted to grow in Okinawa



## NEW POC PROJECTS (2018) Phase I/II Pre-Commercialization

One-step method for synthesizing new classes of cyclopropanes and linear hydrocarbons

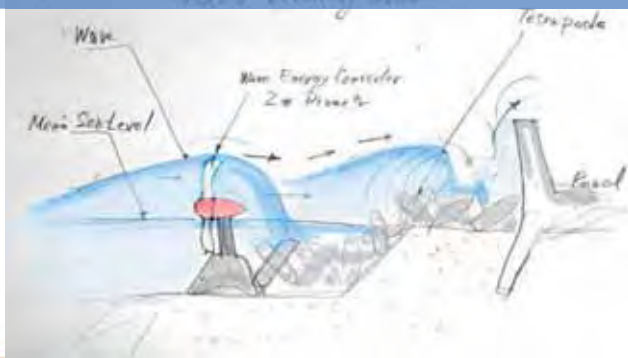


Optimizing MFC technology to treat agricultural waste



Pilot project in the Maldives to test prototypes of a new turbine designed to convert energy from breaking waves to electricity

モルディブにて沿岸の砕波エネルギーを利用する新型タービンの試作品基の実証実験を開始



Holiday Inn Kandooma Maldives



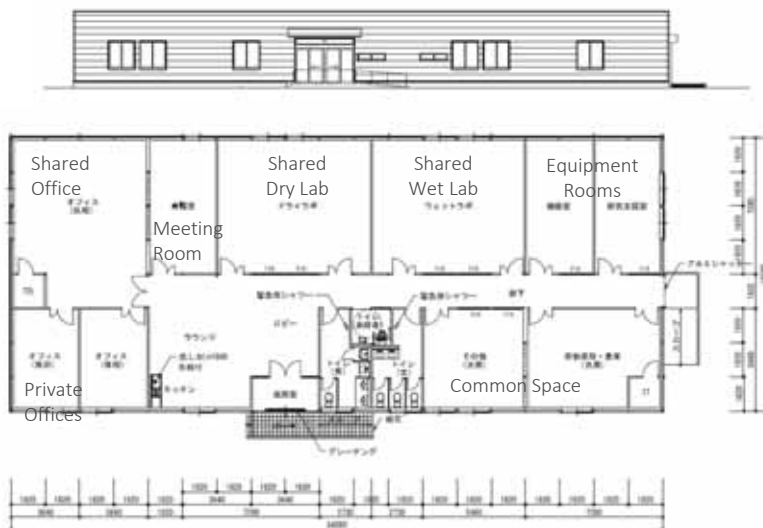
Technology Development & Innovation Center  
**ENTREPRENEURSHIP & INNOVATION**

**INNOVATION INCUBATOR: LAYOUT** レイアウト

Phase I: 500m<sup>2</sup> Pre-fab building with temporary infrastructure  
 フェーズI: 500m<sup>2</sup> プレハブ施設 仮インフラ



example of similar building



| Space Use Allocation<br>用途                          | Size (m <sup>2</sup> )<br>面積 |
|---|------------------------------|
| Shared Office (10 desks)<br>共有オフィス                  | 53                           |
| Private Offices (2)<br>専用オフィス                       | 40                           |
| Shared Dry Lab (6 benches)<br>共有ドライラボ               | 60                           |
| Shared Wet Lab (6 benches)<br>共有ウェットラボ              | 60                           |
| Shared Equipment Rooms<br>共有機器室                     | 53                           |
| Meeting Room<br>会議室                                 | 26                           |
| Common Space (kitchen, storage)<br>共有スペース (キッチン・倉庫) | 149                          |
| Other (entryway, hallways)<br>その他 (玄関、廊下)           | 62                           |
| Total 合計  | 503                          |





## INNOVATION INCUBATOR: OCCUPANTS

INCUBATOR OCCUPANCY TIMELINE

| Category          | FY2018/H30               |   |   | FY2019/H31 |   |   | FY2020/H32                         |    |    | FY2021/H33          |   |   | FY2022/H34          |   |   | FY2023 |   |   |    |    |    |   |   |
|-------------------|--------------------------|---|---|------------|---|---|------------------------------------|----|----|---------------------|---|---|---------------------|---|---|--------|---|---|----|----|----|---|---|
|                   | 2018                     |   |   | 2019       |   |   | 2020                               |    |    | 2021                |   |   | 2022                |   |   | 2023   |   |   |    |    |    |   |   |
|                   | 4                        | 5 | 6 | 7          | 8 | 9 | 10                                 | 11 | 12 | 1                   | 2 | 3 | 4                   | 5 | 6 | 7      | 8 | 9 | 10 | 11 | 12 | 1 | 2 |
| STARTUPS          | MICROBIAL FUEL CELLS     |   |   |            |   |   | NEXT GENERATION SOLAR ENERGY       |    |    |                     |   |   |                     |   |   |        |   |   |    |    |    |   |   |
|                   | NANOPLASMONIC BIOSENSORS |   |   |            |   |   | METABOLOMICS OF AGING              |    |    |                     |   |   |                     |   |   |        |   |   |    |    |    |   |   |
|                   | WAVE ENERGY              |   |   |            |   |   | NANOPARTICLE ENVIRONMENTAL SENSORS |    |    |                     |   |   |                     |   |   |        |   |   |    |    |    |   |   |
|                   | SHOREDITCH-SON           |   |   |            |   |   | Accelerator Startup                |    |    | Accelerator Startup |   |   | Accelerator Startup |   |   |        |   |   |    |    |    |   |   |
|                   | Accelerator Startup      |   |   |            |   |   | Accelerator Startup                |    |    | Accelerator Startup |   |   | Accelerator Startup |   |   |        |   |   |    |    |    |   |   |
|                   |                          |   |   |            |   |   | Accelerator Startup                |    |    | Accelerator Startup |   |   | Accelerator Startup |   |   |        |   |   |    |    |    |   |   |
|                   |                          |   |   |            |   |   | Accelerator Startup                |    |    | Accelerator Startup |   |   | Accelerator Startup |   |   |        |   |   |    |    |    |   |   |
| INDUSTRY PARTNERS |                          |   |   |            |   |   | Industry Partner (in negotiation)  |    |    |                     |   |   |                     |   |   |        |   |   |    |    |    |   |   |
|                   |                          |   |   |            |   |   | Industry Partner (in negotiation)  |    |    |                     |   |   |                     |   |   |        |   |   |    |    |    |   |   |

LEGEND

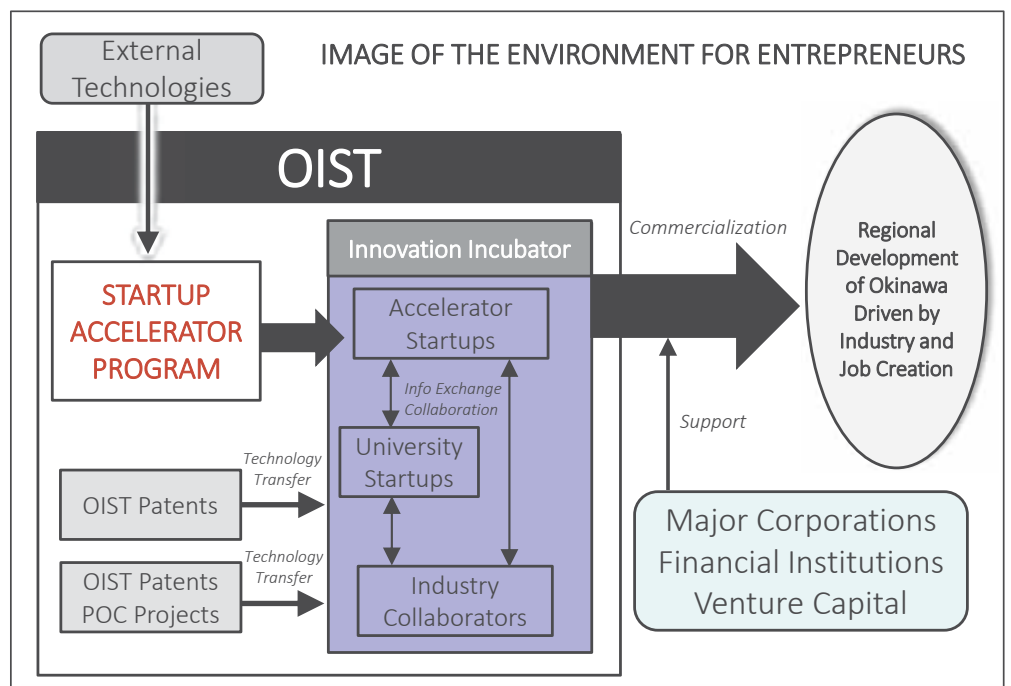
- OIST STARTUPS
- EXTERNAL ACCELERATOR STARTUPS
- EXTERNAL INDUSTRY PARTNERS



## STARTUP ACCELERATOR PROGRAM: NEW MODEL

### NEW MODEL TO PROMOTE STARTUPS IN OKINAWA

1. Recruit science innovators to join OIST as Entrepreneurs-in-Residence, bringing in external technologies
2. Integrate infrastructure, training, and funding into a comprehensive platform to support innovation
3. Network with the private sector to invest in spin-off companies



Adapted from: <https://newswitch.jp/p/12456>

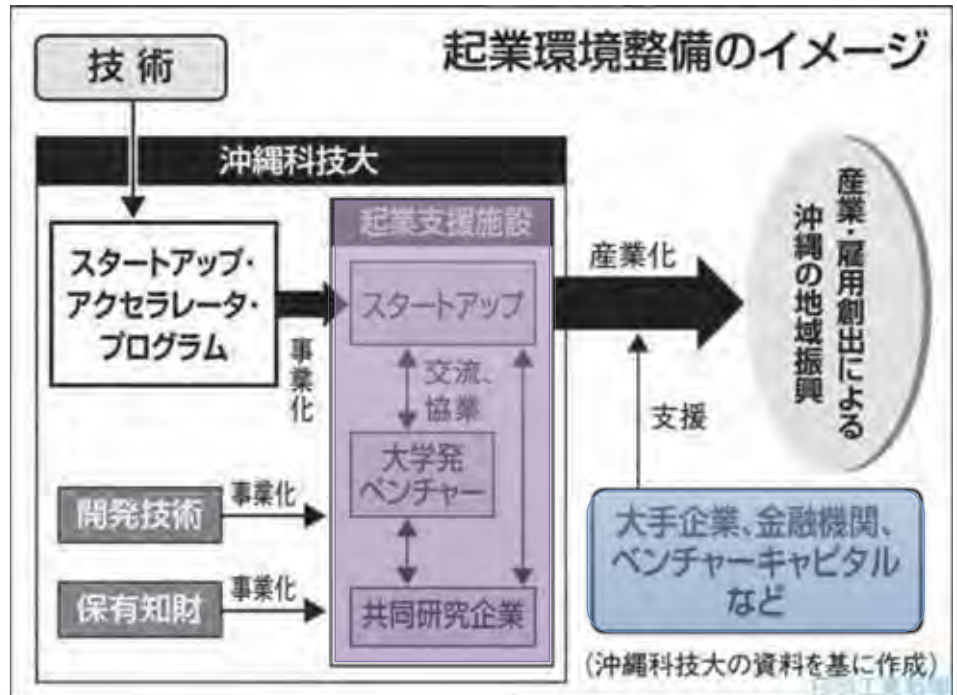
L. Ha & R. Baughman



## スタートアップ・アクセラレータープログラム: 新モデル

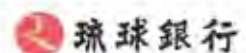
## 沖縄におけるスタートアップ促進の新モデル

1. 採用: 客員起業家(EIR)として科学分野の革新者をOISTに採用することで外部のテクノロジーを呼び込む
2. 統合: インフラ基盤、研修プログラム、助成金をイノベーション支援の包括的なプラットフォームに統合する
3. ネットワーク: スピンオフ会社への投資のために民間セクターとのネットワークを広げる

Source: <https://newswitch.jp/p/12456>

## 起業家育成ネットワーク: ベンチャーキャピタル、金融機関、企業

- 6件のMOUおよび契約を締結
- DEEPCOREとのMOUを締結
  - ソフトバンクグループの100%子会社
  - 東京を拠点にハイテク技術のアクセラレーター、インキュベーター、ベンチャー投資などを行う
  - 下記共同プロジェクトにおいてMOUを締結:
    - 起業家開発
    - 技術開発などにおける企業との共同研究
    - スタートアップ投資



地域経済活性化支援機構 Regional Economy Vitalization Corporation of Japan (REVIC)





# Outline

- Overview and brief history of OIST
- Excellence in Research
- Excellence in Education
- Excellence in Innovation
- **External funding**
- Plans for growth
- Roadmap towards 2021



## The Mid-Term Strategy for External Funding 外部資金中期戦略

The plan for raising external funds encompasses the following categories of income:

外部資金中期戦略には、以下の区分が含まれます。

- Research (Grant) funding 研究助成金
- Business Development funding 事業開発
- Donations 寄付金



# Results:

Comparison of external funding acquisition results and original plan developed in May 2013  
(Million yen) 本学の外部資金の獲得額と2013年5月に策定した外部資金中期計画における「当初見込」額との比較 (百万円)

| No | Item                            |               | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|----|---------------------------------|---------------|--------|--------|--------|--------|--------|
| 1  | Research Funding<br>研究助成金       | Original 当初見込 | 282    | 318    | 384    | 466    | 542    |
| 2  |                                 | Actual 実績     | 294    | 333    | 291    | 360    | 648    |
| 3  |                                 | Difference 差  | 12     | 15     | -93    | -106   | 106    |
| 4  | Business<br>Development<br>事業開発 | Original 当初見込 | 97     | 86     | 101    | 123    | 148    |
| 5  |                                 | Actual 実績     | 113    | 81     | 141    | 230    | 211    |
| 6  |                                 | Difference 差  | 16     | -5     | 40     | 107    | 63     |
| 7  | Donation<br>寄付金                 | Original 当初見込 | 23     | 30     | 45     | 55     | 55     |
| 8  |                                 | Actual 実績     | 8      | 1      | 36     | 11     | 35     |
| 9  |                                 | Difference 差  | -15    | -29    | -9     | -44    | -20    |
| 10 | Endowment<br>基金からの利払い           | Original 当初見込 | 0      | 1      | 10     | 39     | 97     |
| 11 |                                 | Actual 実績     | 0      | 0      | 0      | 0      | 0      |
| 12 |                                 | Difference 差  | 0      | -1     | -10    | -39    | -97    |
| 13 | Total<br>合計                     | Original 当初見込 | 402    | 435    | 540    | 683    | 842    |
| 14 |                                 | Actual 実績     | 415    | 415    | 469    | 600    | 894    |
| 15 |                                 | Difference 差  | 13     | -20    | -71    | -83    | 52     |

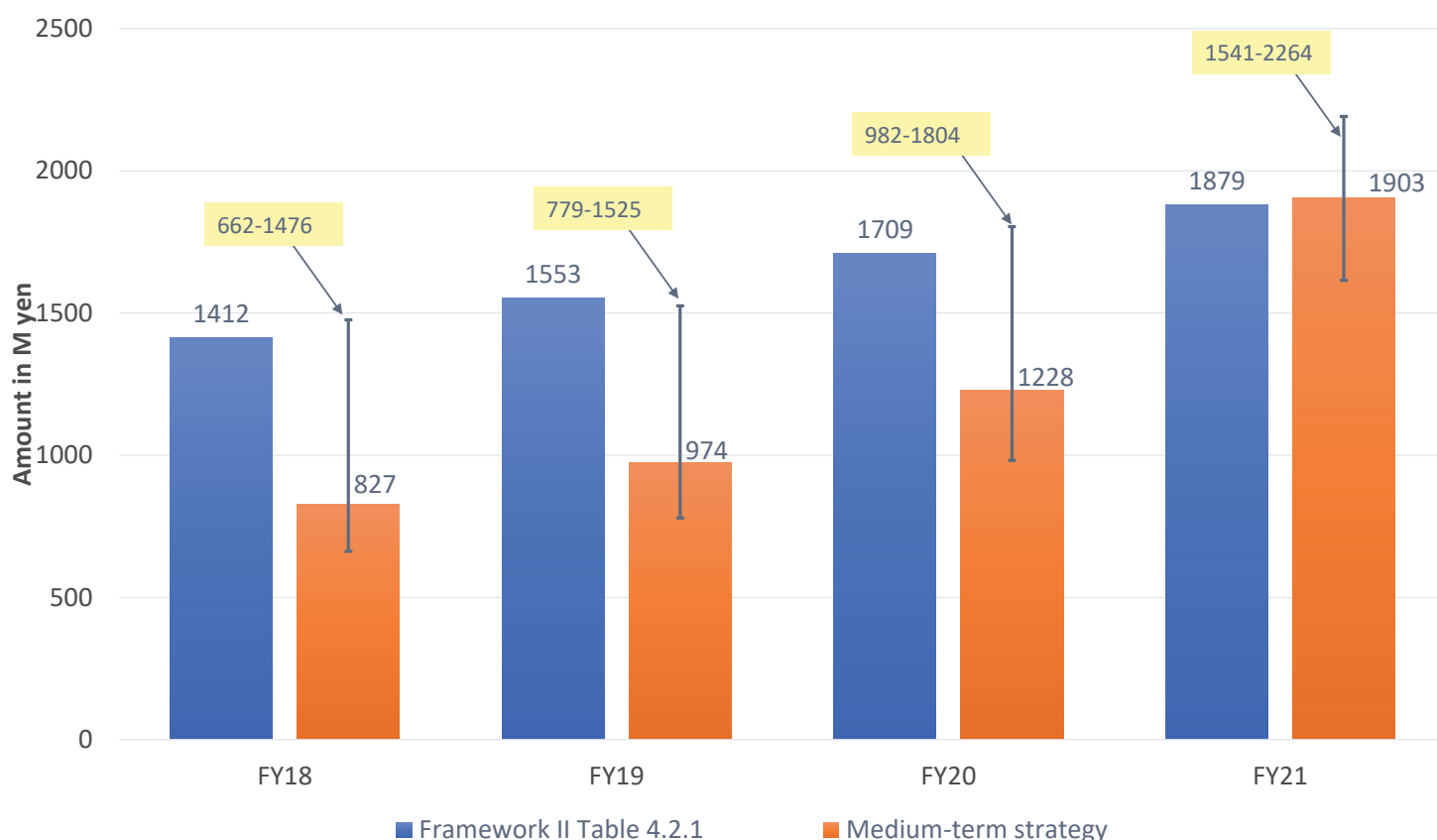


# Results:

- In FY17, OIST had exceeded the original goal for external funding acquisition set forth in the Mid-term strategy for External Funding in 2013.
- 平成29年度の時点で、当初の予測額を上回っている。
- Though there is no endowment and a small number of donations, OIST has made large advances in obtaining research funding and business development funding.
- 基金からの利払い及び寄付金の獲得額は十分ではないが、研究助成金と事業開発の区分で大きな実績を上げている。
- Thus, the projection was re-assessed based on our current capabilities and compared to the external funding figures in Framework II Table 4.2.1.
- これら実績を踏まえ、外部資金中期計画における予測を見直した。



# Projected External Funding



Denotes range of potential external funds based on grant results

## FY2018 KAKENHI Adoption (as of April 1, 2018)

平成30年度科研費採択状況（平成30年4月1日現在）

|            | 平成29年度 vs 平成30年度          | 平成29年度        | 平成30年度        |
|------------|---------------------------|---------------|---------------|
|            | <b>FY2017 vs FY2018</b>   | <b>FY2017</b> | <b>FY2018</b> |
| 応募数        | # of application          | 126           | 115           |
| 採択数        | Adoption                  | 31            | 38            |
| 採択率        | Success rate              | 24.6%         | 38.4%         |
| 交付額(新規+継続) | Amount (new + continuous) | 245 M yen     | 260 M yen     |

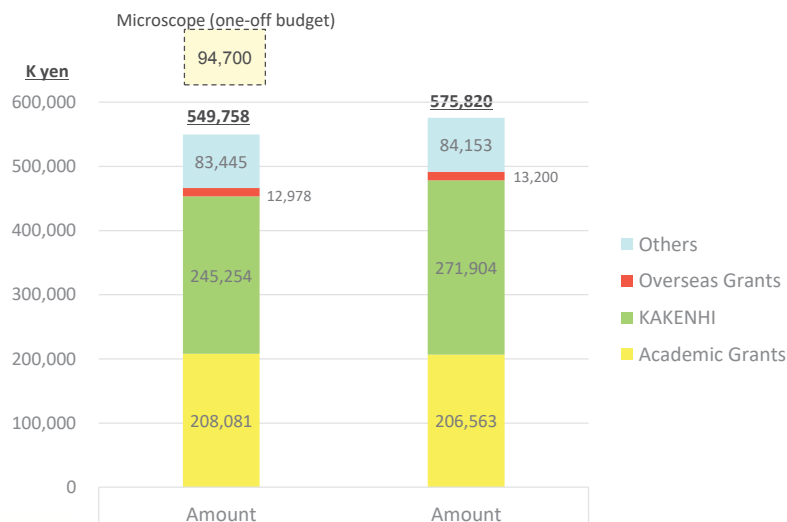
|     | ポジション           | 応募数                     | 採択数             | 採択率                 |
|-----|-----------------|-------------------------|-----------------|---------------------|
|     | <b>Position</b> | <b># of application</b> | <b>Adoption</b> | <b>Success rate</b> |
| 教員  | Faculty         | 17                      | 7               | 41.2%               |
| 研究員 | Researcher      | 77                      | 30              | 39.0%               |
| その他 | Others          | 5                       | 1               | 20.0%               |
| 審査中 | TBDs            | 16                      | TBD             | TBD                 |
|     | <b>Total</b>    | <b>115</b>              | <b>38</b>       | <b>38.4%</b>        |

38 out of 99 excl. TBDs  
99件中38件(審査中を除く)

# Academic External Funding FY17 vs FY18

As of Aug 1, 2018

| Category        | FY2017     |                | FY2018     |                |
|-----------------|------------|----------------|------------|----------------|
|                 | # of grant | Amount         | # of grant | Amount         |
| Academic Grants | 10         | 208,081        | 9          | 206,563        |
| KAKENHI         | 86         | 245,254        | 107        | 271,904        |
| Overseas Grants | 1          | 12,978         | 1          | 13,200         |
| Others          | 35         | 83,445         | 41         | 84,153         |
| <b>Total</b>    | <b>132</b> | <b>549,758</b> | <b>158</b> | <b>575,820</b> |



## Business Development Funding: Performance

Efforts to increase external funding for research and technology transfer

事業開発 外部資金：成果 研究および技術移転のための外部資金の増加に向けた取り組み



# External Funding: Philanthropy



- As of August 31, 2018, the Okinawa Institute of Science and Technology Foundation, Inc. was officially established as a New York State non-profit entity.
- Four initial trustees:
  - Julie Meier-Wright, California Council on Science and Technology**
  - Edward Kuba, Attorney, former University of Hawai'i Regent**
  - Rhonda Donahoe, CFO of NJK Holding Corporation**
  - David Janes (as Secretary), OIST**
- Seeking additional nominations for trustees
- Will work closely with incorporate.com (with over 100 years experience in this field) and the founding trustees to move forward: 501-c-3 filings, bylaw development, opening bank account, structuring giving opportunities with OIST, charitable solicitation filings



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- Roadmap towards 2021



# Plans for growth: OIST Campus Today

## 成長計画：今日のOISTキャンパス

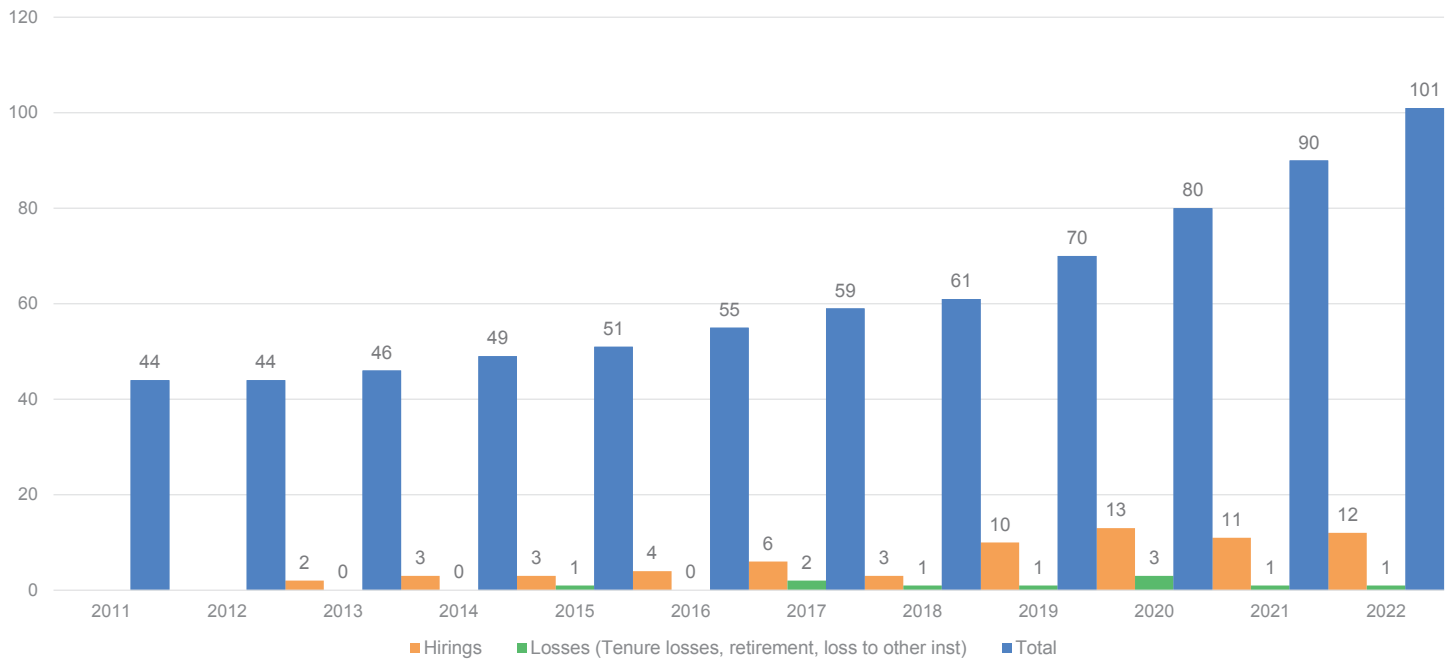


# OIST Campus Tomorrow

## 将来のOISTキャンパス



## Projected Numbers for Faculty



## Education of Children of OIST Members

Comments from Perspective Council members:

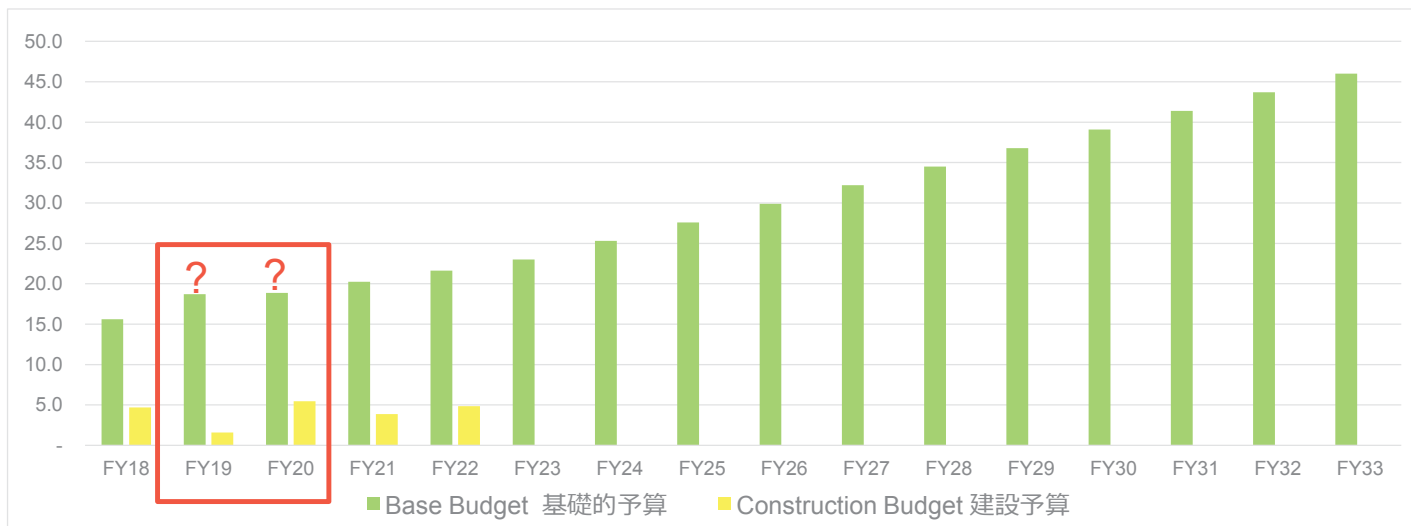
- The lack of an international school with an international baccalaureate program reduces OIST's pool of potential faculty and researchers.
- The Council has offered to write a strong letter to the government urging the need for a high quality international school.
- The Council acknowledged that this has been an ongoing conversation since the conception of OIST.



## Simulation of Budget for FY20-FY22 (base budget + construction budget) FY20-FY22 予算シミュレーション (基礎的予算+施設整備費予算)

|                            | FY18 | FY19 | FY20 | FY21 | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 | FY33 |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1 Headcount of faculty 教員数 | 70   | 76   | 82   | 88   | 94   | 100  | 110  | 120  | 130  | 140  | 150  | 160  | 170  | 180  | 190  | 200  |
| 2 Base Budget 基礎的予算        | 15.6 | 18.7 | 18.9 | 20.2 | 21.6 | 23.0 | 25.3 | 27.6 | 29.9 | 32.2 | 34.5 | 36.8 | 39.1 | 41.4 | 43.7 | 46.0 |
| 3 Construction Budget 建設予算 | 4.7  | 1.6  | 5.5  | 3.9  | 4.9  |      |      |      |      |      |      |      |      |      |      |      |
| 4 Total Budget 予算 (合計)     | 20.3 | 20.3 | 24.3 | 24.1 | 26.5 |      |      |      |      |      |      |      |      |      |      |      |

Budget Per PI, 教員当り予算 = 0.23 Billion yen, 10億円



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# Roadmap towards 2021



## Perspective Council Members 研究展望委員会メンバー

External

Internal



Ryoji Noyori  
野依 良治



Steven Chu  
スティーブン・チュー



Anthony Hyman  
アンソニー・ハイマン



Kenji Doya  
銅谷 賢治



Amy Shen  
エイミー・シェン



Síle Nic Chormaic  
シーレ・ニコーマック



Ada Yonath  
アダ・ヨナス



Tobias Bonhoeffer  
トビアス・ボンヘッファー



Eric Betzig  
エリック・ベツィグ



Evan Economo  
エヴァン・エコノモ



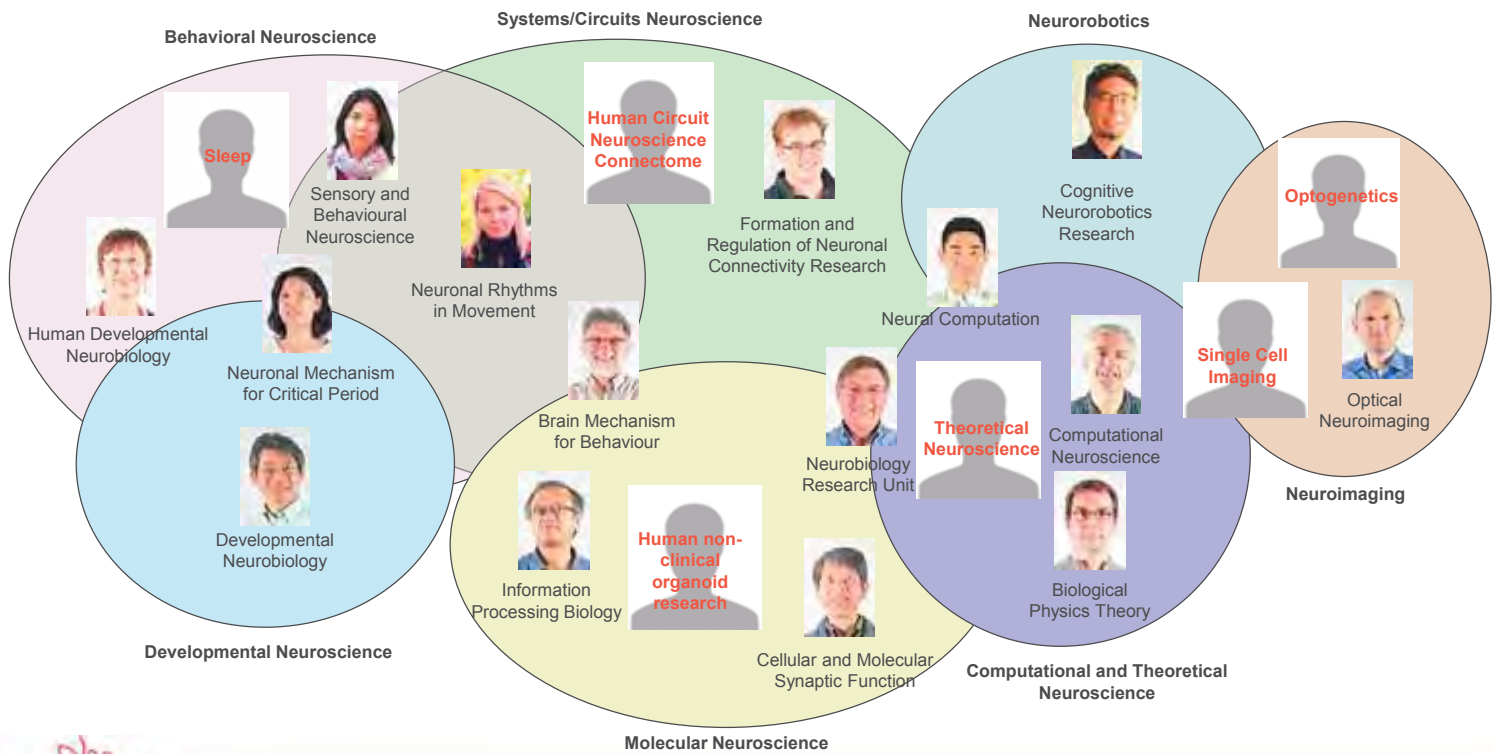
Yohei Yokobayashi  
横林 洋平



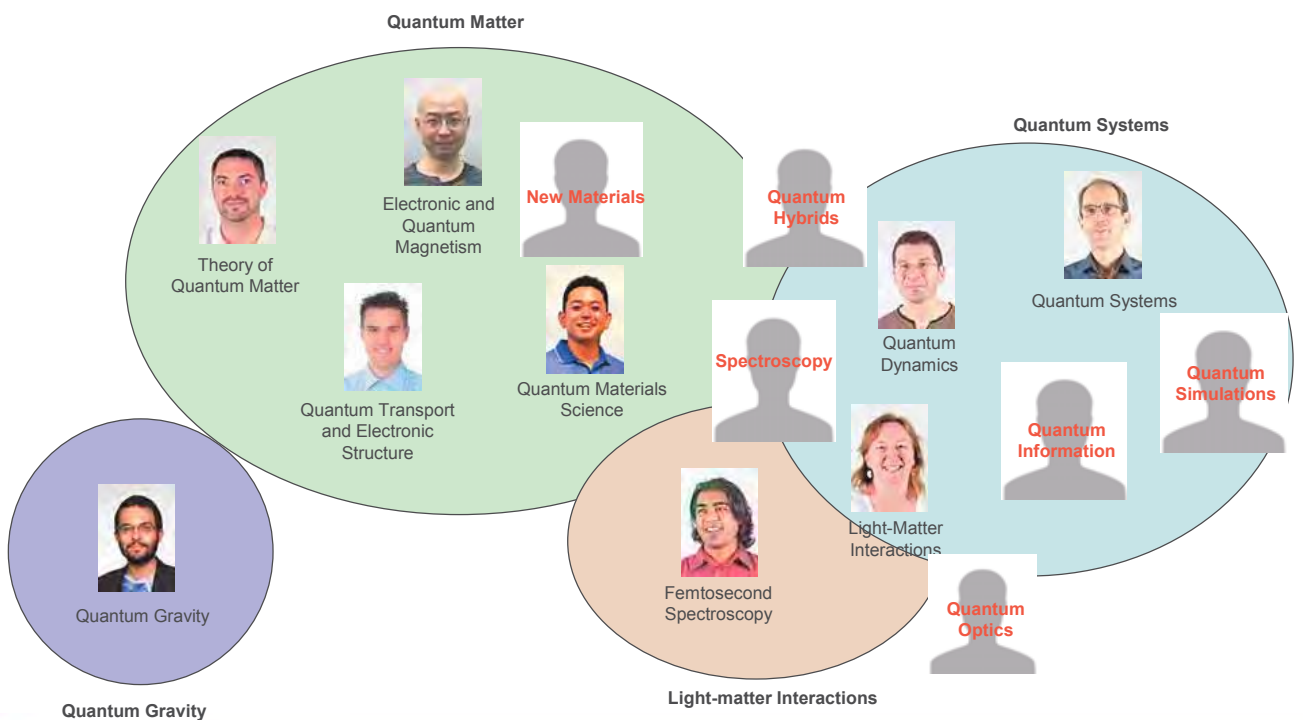
Ichiro Maruyama  
丸山 一郎



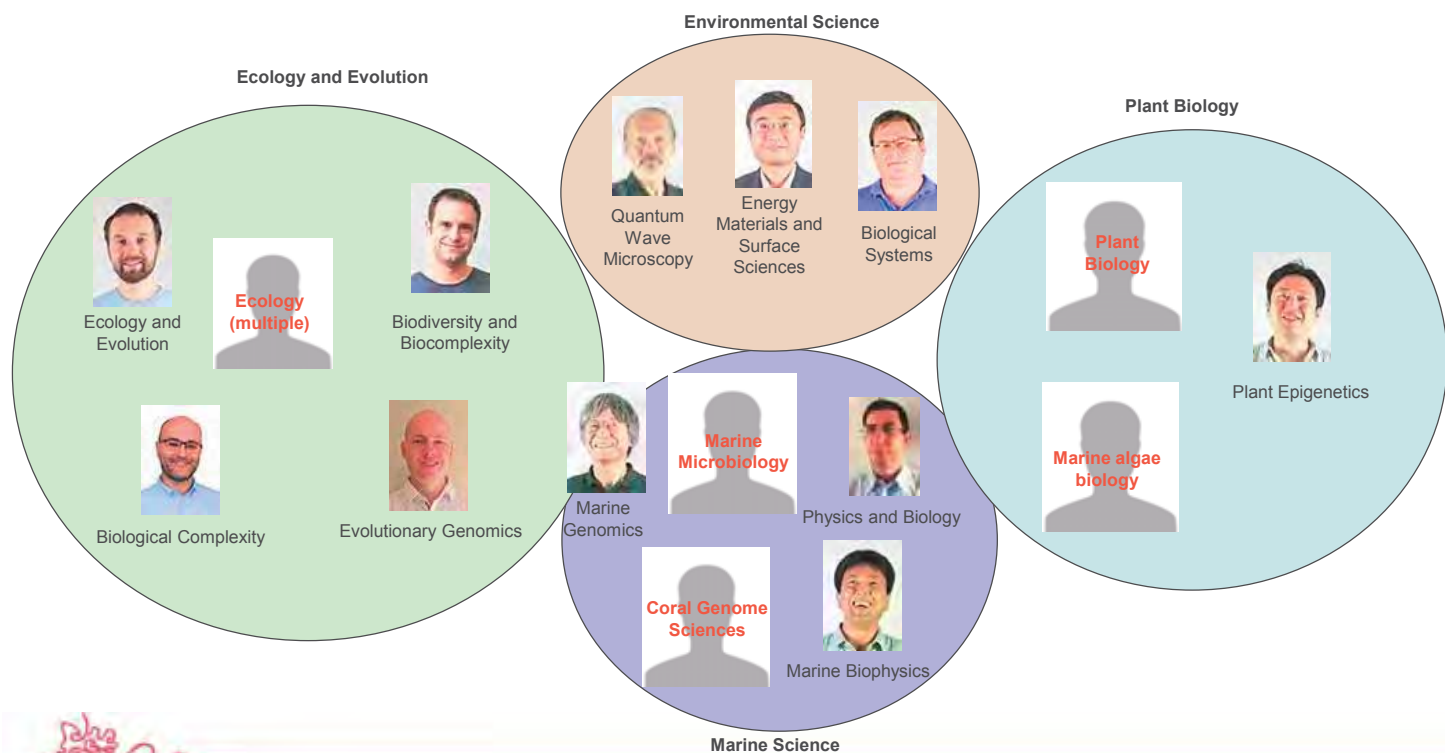
# Subject Area Recommendations: Neuroscience



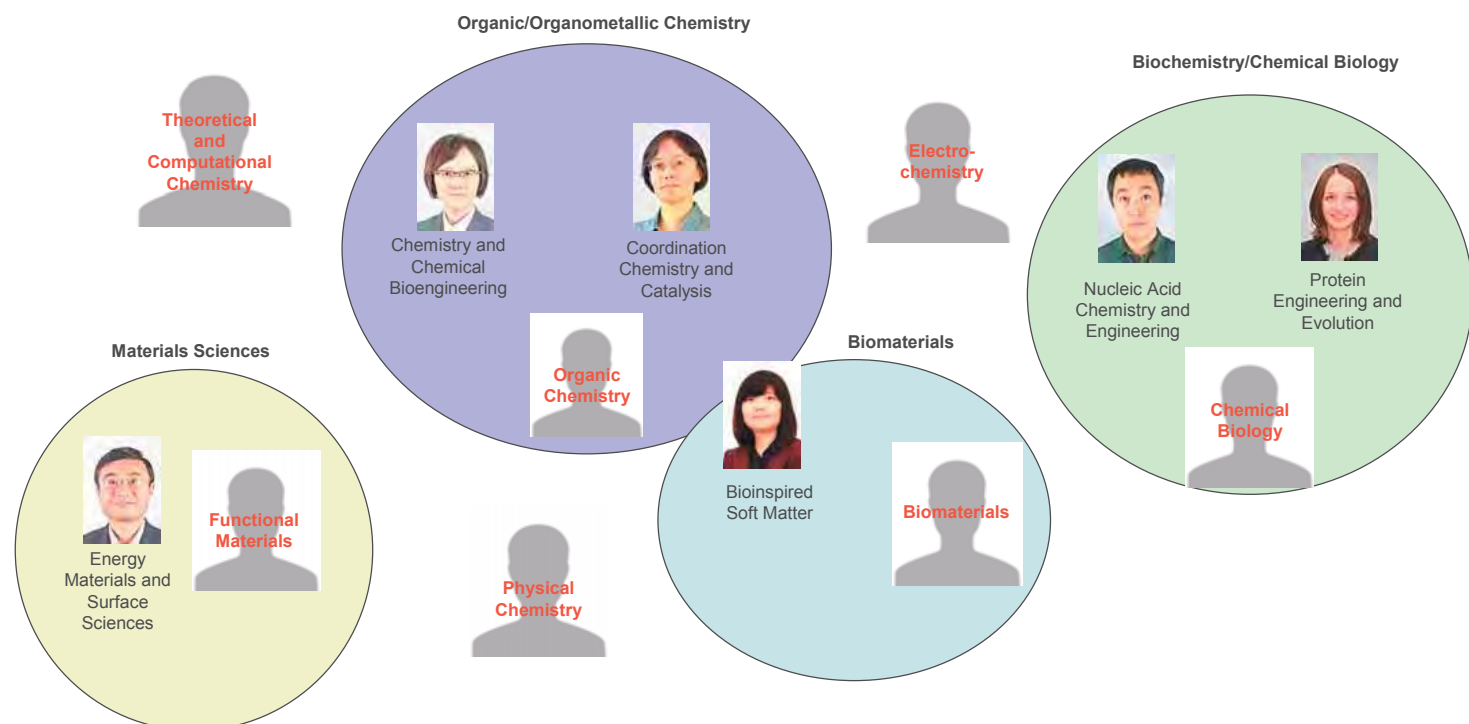
# Subject Area Recommendations: Quantum Sciences



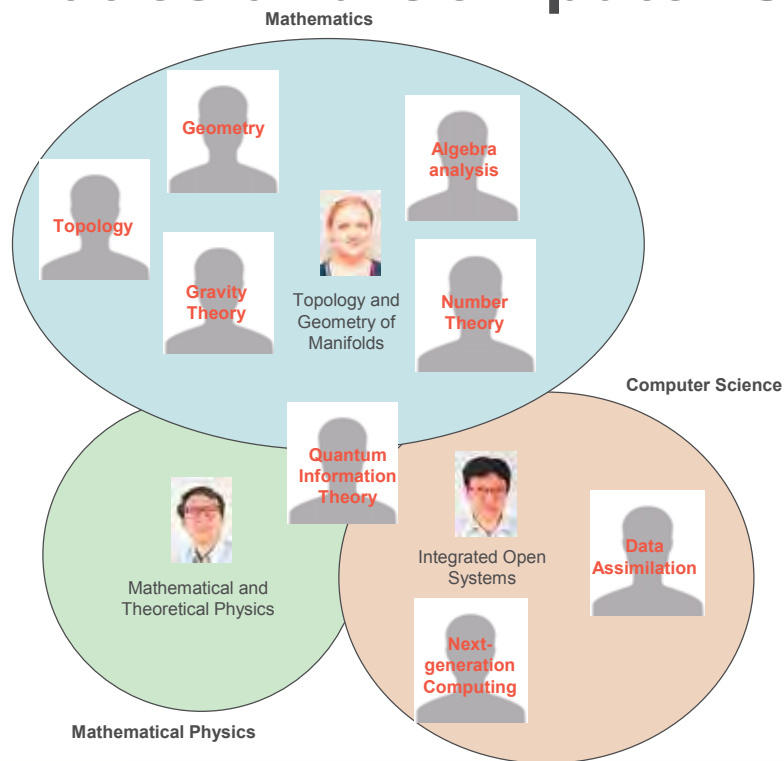
# Subject Area Recommendations: Ecology and Environmental/Marine Science



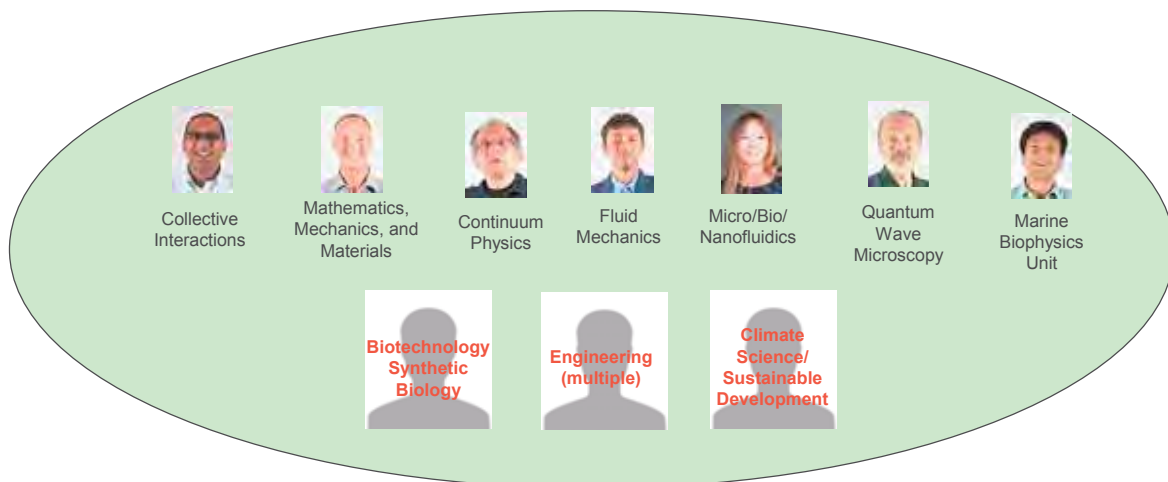
# Subject Area Recommendations: Materials and Chemistry



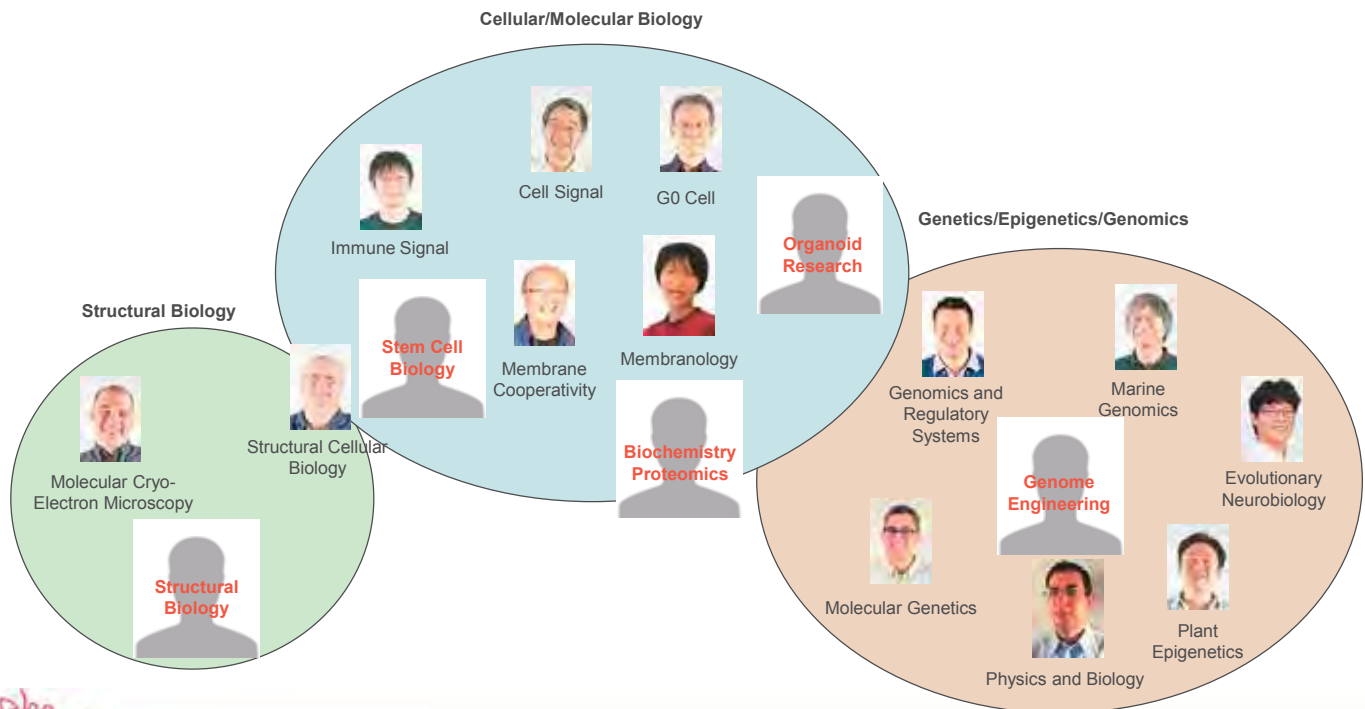
# Subject Area Recommendations: Mathematics and Computer Science



# Subject Area Recommendations: Applied Sciences/Engineering



# Subject Area Recommendations: Life Sciences



## Additional Recommendations: Recruiting and Hiring Strategy

- Hire renowned senior scientists and allow them to bring several junior faculty members
- OIST faculty members may also function as headhunters while attending conferences/workshops/meetings.
- Look at industry researchers for faculty positions as well
- The Council stressed the importance of quality of the individual over strategy.



# Roadmap towards 2021



## Strategy Roadmap 戦略ロードマップ

### Executive Retreat

President, Executive Vice President, Provost, Chief Operating Officer, Faculty Assembly Chair, Deans, Vice-Presidents, General Counsel

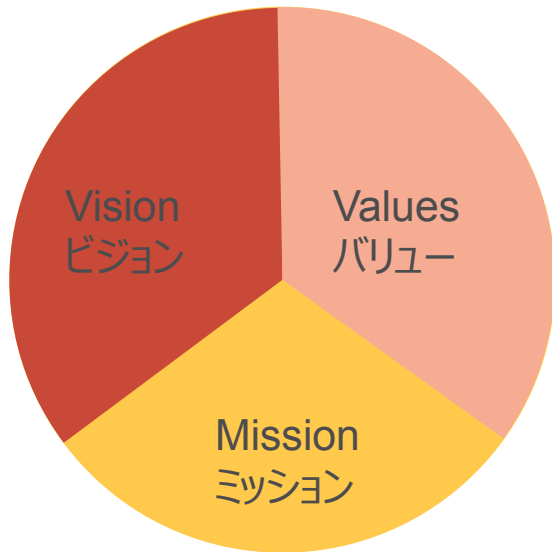
- Purpose of the Retreat  
Develop a Strategic Plan
  - Build on Framework documents
  - Planning for the Decennial Review
- Output
  - Vision, Values & Mission ideas
  - List of Challenges
    - Task Forces

### エグゼクティブ・リトリート

- 学長、首席副学長、プロボスト、チーフ・オペレーティング・オフィサー、教授会議長、研究科長、研究担当ディーン、副学長、統括弁護士
- レトリートの目的：戦略計画の展開
  - 枠組み文書の拡大
  - 10年レビューに向けた計画
- アウトプット
  - ビジョン、バリュー、ミッション
  - 課題リスト
    - タスクフォース



# Strategy Roadmap 戦略ロードマップ



- What we aim to achieve 目標
- What are our core principles コア原則
- How we will achieve our vision and thus fulfil the goal of conducting  
いかにビジョンに向かってゴール達成を実現するか

“Internationally outstanding education and research in science and technology, and thus contribute to the sustainable development of Okinawa, and promote and sustain the advancement of science and technology in Japan and throughout the world.”

「科学技術において、国際的に卓越した教育と研究を通じ、沖縄の持続可能な発展と、日本と世界における科学技術の振興に貢献し続けること」

Preliminary statements prepared  
準備声明も作成



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# Strategy Roadmap 戦略ロードマップ

## Task Forces

Academic Structure  
Administrative Structure  
Delivering the Benefits  
Professional Development  
Community Development  
Campus Development  
Communication and Branding

## タスクフォース

- アカデミック・ストラクチャー
- アドミニストレイティブ・ストラクチャー
- 利益や恩恵をもたらす
- プロフェッショナル・ディベロプメント
- コミュニティー・ディベロプメント
- キャンパス造成
- コミュニケーションとブランディング



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# Strategic Plan

# 戦略プランのスケジュール



## Roadmap towards 2021





# 2019 External Peer Review

- In advance of the 10-year evaluation, OIST will host an External Peer Review in November 2019.
- Olaf Kubler and Maki Kawai, who were part of the 2015 External Peer Review, have agreed to serve on the 2019 Review panel.



Prof. Dr. Olaf Kubler  
Former President  
ETH Zurich

Confirmed panelists include: **Artur Ekert** (quantum physics and mathematics), **David Baltimore\*** (life sciences), **Shirley Tilghman** (biochemistry/molecular biology) and **Maki Kawai** (materials science), **Peter Chen** (chemistry), **Phil Sharp\*** (technology transfer), **Martin Grötschel** (mathematics)

We are awaiting confirmation from additional panelists including **Harold Varmus\*** (life sciences) and **Jennifer Chayes** (math/computer science)

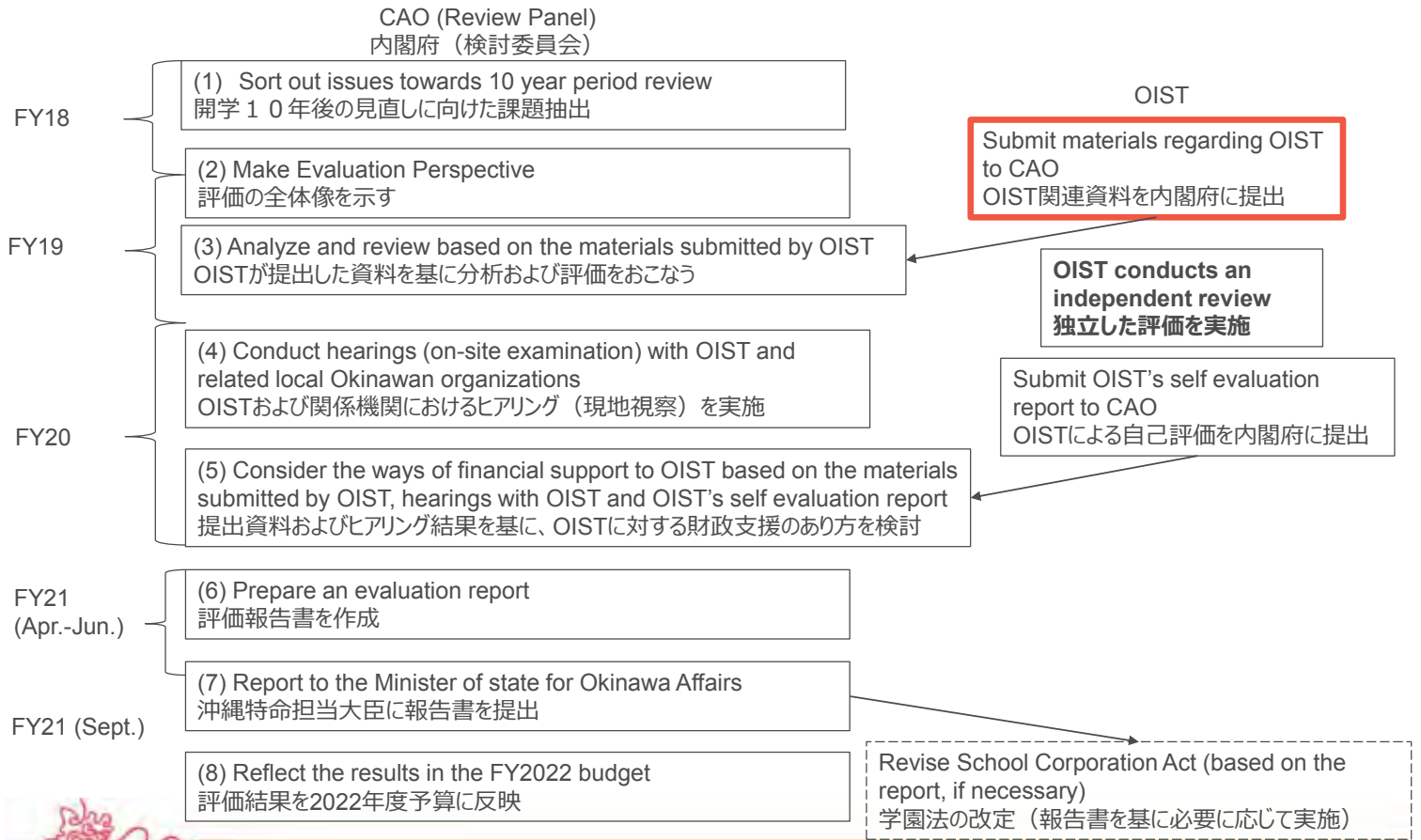


\* denotes Nobel Laureates

## Roadmap towards 2021



# 10 Year Evaluation Timeline 開学10年後の見直しタイムライン



## Vision for OIST 2030 OISTの2030年沖縄ビジョン



We are currently laying the groundwork to achieve the following goals by 2030:  
私たちは2030年に向けた以下の目標の実現を目指し、重要な取組を進めています。

- Secure the reputation of OIST as a premier institute for research and education, similar to MIT or CALTECH  
MITやカリフォルニア工科大学に匹敵する世界トップクラスの研究教育機関という定評を確立する
- Establish Okinawa as the epicenter of Japan's biomedical research through partnerships with the University of the Ryukyus in the creation of the Okinawa Health Medical Innovation Center  
沖縄における国際医療拠点形成に向けて琉球大学との連携を図り、沖縄を日本の生物医学研究の一大拠点へと発展させる
- Cultivate partnerships with other major Japanese universities, such as the University of Tokyo  
東京大学を含む国内の主要大学との連携を推進
- Strengthen the economy of Okinawa through the recruitment of investors, industry and entrepreneurs to the innovation incubator  
投資家や事業者、起業家をイノベーション・インキュベーターに誘致し、沖縄の経済成長を促進
- Engage with major Asian cities such as Tokyo, Singapore, Seoul, Taipei and Shanghai to form a research/economic cluster  
東京やシンガポール、ソウル、台北、上海といったアジア主要都市を巻き込み、知的産業クラスターの形成を図る

