



IROAST ACTIVITY REPORT

2022.4—2023.3
年次報告書

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[Annual Report (English version only)]

Please refer to the link for a report on each faculty member's research and each project for FY2022.
2022年度の各教員の研究報告及び各事業についてはこちらのリンクを参照ください。(英語版のみ)

<https://iroast.kumamoto-u.ac.jp/annual-report-2022/>



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IROAST ACTIVITY REPORT

2022.4—2023.3



Kazuki TAKASHIMA 高島 和希
Director, IROAST 国際先端科学技術研究機構長

The fiscal year 2022 marked the beginning of the second phase for IROAST. While managing the tenure track program and establishing a robust international research network, IROAST has expanded into new research support initiatives. Specifically, we have designated new priority areas that contribute constructing a Well-being Society, which includes bio-medical research, low environmental impact technology, biophysical environmental studies, and resilience enhancement.

2022年度(令和4年度)はIROASTの第2フェーズ開始の年となりました。そこでIROASTでは、これまでの実績であるテニュアトラックの運営、強固な国際共同研究ネットワークの構築を継承しつつ、新たな支援事業への展開も図ることにしました。特に、Well-being社会構築に寄与する重点領域(バイオ・医療、低環境負荷、生物環境学、レジリエンス強化)を新たに設定するとともに、先

Additionally, we actively promote initiatives in advanced materials and data science. Furthermore, we have launched a support program for young researchers expected to make significant global contributions. This brochure has been compiled to introduce the activities of IROAST in the fiscal year 2022. We kindly ask you to read it and provide your opinions and feedback. We sincerely appreciate your continued support for the activities of IROAST.

進材料、AIを含むデータサイエンスへの取組も推進します。さらに、将来世界的に活躍が期待できる若手研究者を支援する取組も開始しました。本冊子は、2022年度のIROASTの活動を紹介するために作成したものです。ぜひ、ご一読いただき、ご意見やご感想をいただければ幸いです。引き続きIROASTの活動へのご支援を心よりお願い申し上げます。

Major Research Area 重点研究領域

Science and Technology for Building a Well-being Society

Well-being社会構築のための科学技術



Three Missions in Phase 2

第二フェーズの取組み

01

The cultivation of talented young researchers to lead the future 未来を担う優秀な若手人材の育成

Identifying research gemstones with outstanding creativity and developing them into the world's most advanced research.
創造性に優れた研究の原石を見つけ、世界最先端の研究へと育成します。



02

The establishment of strong international joint research networks and promotion of international joint research 強固な国際共同研究ネットワークの構築と国際共同研究の推進

Strengthening and expanding strategic international collaborative research networks for the next generation.

次世代へ向けた戦略的国際共同研究ネットワークの強化・拡充を行っています。

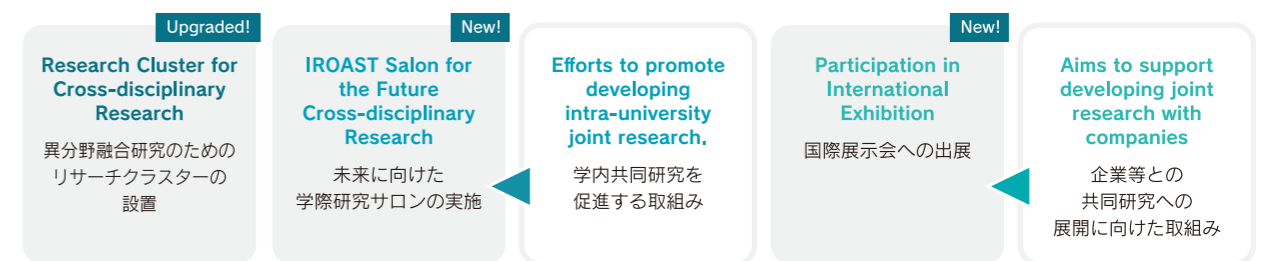


03

The development of leading, cutting-edge research projects through interdisciplinary integration 異分野融合のもと、先導的かつ先端的研究プロジェクトの開拓

Research clusters, for example, which conduct integrated research between medical and engineering fields are attracting high interest from researchers in other fields, companies, and other organizations.

医療系と工学系の融合研究を行うリサーチクラスターなど、他分野研究者や企業等の高い関心を集めています。



Activity Highlights in 2022

2022年度の活動ハイライト

01 Launched the second phase of IROAST with new members

新たなメンバーを迎えて第2フェーズを始動


<p>Director 研究機構長</p>  <p>Dr. Kazuki TAKASHIMA</p>	<p>Vice Director 副研究機構長</p>  <p>Dr. Kei TODA FAST</p>	<p>Distinguished Professors 卓越教授</p>  <p>Dr. U.Rajendra ACHARYA</p>  <p>Dr. Dmitri Aleks MOLODOV</p>  <p>Dr. László PUSZTAI</p>  <p>Dr. Yufeng ZHENG</p>
<p>Tenure-track Associate Professors テニュアトラック准教授</p>  <p>Dr. Gaochuang CAI</p>  <p>Dr. Masahiko FURUTANI</p>  <p>Dr. Hiroki MATSUO</p>  <p>Dr. Zhongyue ZHANG</p>  <p>Dr. Jonas Karl N. AGUTAYA</p>  <p>Dr. Prafulla Bahadur MALLA</p>  <p>Dr. Reetu Rani</p>	<p>Postdoctoral Researchers 特別研究員</p>	
<p>International Joint Research Faculty Members 国際共同研究員</p>  <p>Dr. Takumi HIGAKI FAST</p>  <p>Dr. Takahiro HOSONO FAST</p>  <p>Dr. Kei ISHIDA CWMD</p>  <p>Dr. Makiko KOBAYASHI FAST</p>  <p>Dr. Ruda LEE IINa</p>  <p>Dr. Yuta NAKASHIMA FAST</p>  <p>Dr. Shin-Ichi OHIRA FAST</p>		
 <p>Dr. Atsushi SAINOKI FAST</p>  <p>Dr. Mitsuru SASAKI IINa</p>  <p>Dr. Keitaro TAKAHASHI FAST</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;">  <p>Tenure-track Professor (till June 2022) テニュアトラック教授(2022年6月末まで) Obtained tenure in July 2022 2022年7月テニュア取得</p> <p>Dr. Mitsuhiro AIDA FAST</p> </div>		

FAST: Faculty of Advanced Science and Technology 大学院先端科学研究部
 CWMD: Center for Water Cycle, Marine Environment and Disaster Management くまもと水循環・減災研究教育センター
 IINa: Institute of Industrial Nanomaterials 産業ナノマテリアル研究所

02 Selected 25 international collaborative research groups, certainly leading the world, and certified them as research clusters.

確実に世界を先導している国際共同研究を選抜し、25リサーチクラスターを認定

Research Cluster by Young Researchers 13	Research Cluster by World-leading Researchers 12
若手研究者によるリサーチクラスター	世界レベル研究者によるリサーチクラスター


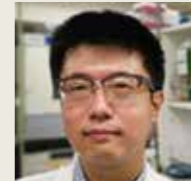


The list of research clusters リサーチクラスター一覧 

03 Started a new research support program to identify and developing promising talents for excellence

有望な研究者を発掘・育成するための研究支援プログラムを新たに開始



Support Program for Young Researchers: 6 researchers were selected
 若手研究者支援: 研究者6人を選抜

					
Dr. Yusuke INOMATA FAST	Dr. Yoshihiro SEKINE POIE	Dr. Muhammad Sohail AHMAD IINa	Dr. Yi-Lun TSAI FAST	Dr. Akira UEDA FAST	Dr. Wei XU FAST

POIE: Priority Organization for Innovation and Excellence
 大学院先導機構

04 Restarted face-to-face research exchanges with overseas researchers after the COVID-19 pandemic

コロナ後に海外の研究者との対面での研究交流を再開

IROAST International Joint Research Travel Support Program 国際共同研究のための海外派遣支援制度	10 researchers visited 7 countries.
IROAST Visiting Professor and Visiting Associate Professor Invitation Program 先導的研究推進のための客員教授等招へいプログラム	11 researchers came to IROAST
IROAST Strategic Research Internship Program (online and in-person) 戦略的ハイブリッド型研究インターンシッププログラム ※Hybrid of online and in-person 対面とオンラインのハイブリッド型	2 participants for hybrid course 3 participants for online course
Hosting International Symposia and Seminars 国際シンポジウム・セミナー等の開催	80 speakers invited for 16 symposia/seminars

For details, refer to page 5-6.

International Research Exchanges

国際研究交流

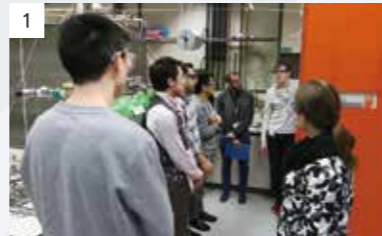
IROAST International Joint Research Travel Support Program

国際共同研究推進のための海外派遣支援制度

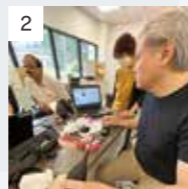
IROAST sends outstanding researchers to overseas universities and research institutes to enhance the international presence of the University in academic research and to promote international joint research.

IROASTは優秀な研究者を海外の大学や研究機関に派遣し、学術研究における本学の国際的プレゼンスを高め、国際共同研究を推進しています。

Selected applicants	Destination institutions
Dr. Jonas Karl Christopher Nuevas AGUTAYA ¹	University of Tübingen, Germany
Dr. Hamid HOSANO	University of Glasgow, UK Imperial College London, UK
Dr. Makiko KOBAYASHI ²	Ngee Ann Polytechnic, Singapore
Dr. Ruda LEE	Korea Basic Science Institute, Korea Kangwon National University, Korea
Dr. Nobutatsu MOCHIZUKI	Université Clermont Auvergne, France Université d'Orléans, France
Dr. Yoshihiro SEKINE	ICPAC Kota Kinabalu 2022, Thailand
Dr. Kohei SHIMAMURA	University of Southern California, USA
Dr. Masayuki TANABE ²	Ngee Ann Polytechnic, Singapore



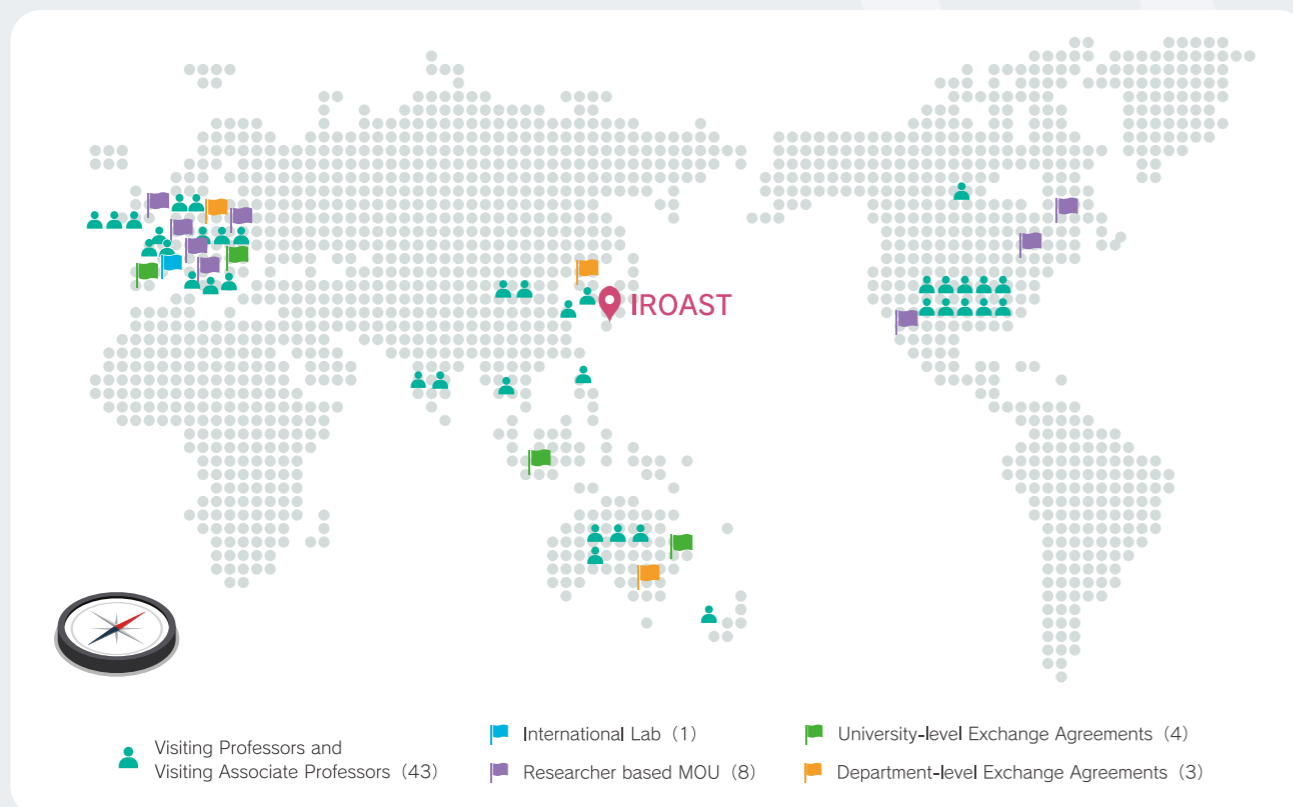
Dr. Agutaya attend the block course "Chemical Sensors".



Drs. Kobayashi and Tanabe conducted the joint research with Distinguished Prof. Acharya and Dr. Ru San Tan.

IROAST Cooperative Relationships for International Joint Research Network

国際共同研究ネットワークのための協力関係



IROAST Visiting Professor and Visiting Associate Professor Invitation Program

先導的研究推進のための客員教授等招へいプログラム



Visiting professors, visiting associate professors, and their candidates are invited to IROAST to deepen international exchange in research and education.

客員教授や客員准教授、その候補者をIROASTに招へいし、研究・教育面での国際交流の深化と国際共同研究の発展を図っています。

Invited Researchers	Affiliation and Position of Invited Researchers
Dr. Nicolae BARSAN	Senior Researcher, The Institute of Physical and Theoretical Chemistry, University of Tübingen, Germany
Dr. Pavel LEJČEK	Professor, Institute of Physics, Academy of Sciences of Czech Republic, Czech Republic
Dr. Patrice DELMAS	Associate Professor, Department of Computer Science, The University of Auckland, New Zealand
Dr. Josep Lluís BALONA-VILAR	Professor, Universidad de Valencia, Spain
Dr. Darrio ZAPPA	Associate Professor, the University of Brescia, Italy
Dr. Suttichai ASSABUMRUNGRAT	Professor, Chulalongkorn University, Thailand
Dr. Amir SI LARBI	Professor, ECL, University of Lyon, France
Dr. Konstantinos Daniel TSAVDARIDIS	Professor, City, University of London, UK
Dr. Bruno FAVERY	Senior Scientists, INRA, France
Dr. Shie-Ming PENG	Distinguished Research Professor, National Taiwan University, Taiwan
Dr. Olivier BOUTIN	Professor, Aix-Marseille University, France

IROAST Strategic Research Internship Program

戦略的ハイブリッド型研究インターンシッププログラム

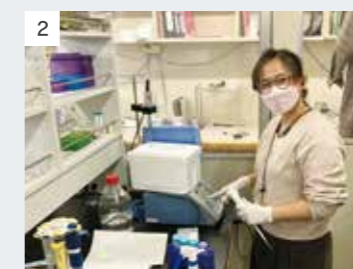
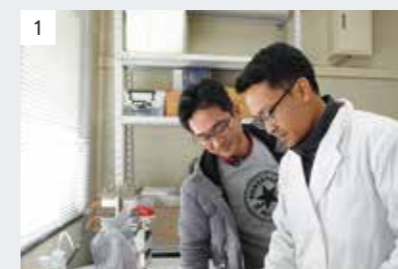


IROAST provides hands-on research opportunities for highly motivated graduate students and young postdoctoral researchers.

意欲的な大学院生やポスドクなどの若手研究者に実践的な研究機会を提供しています。

Internship students	Host faculty members	Duration (including online)
Mr. Rahmat HIDAYAT, Indonesia ¹	Dr. Shin-Ichi OHIRA	Nov. 25, 2022 – Jan. 31, 2023 On-site: Dec. 5, 2022 – Jan. 25, 2023
Ms. Hsiu Chin HUANG, Taiwan ²	Dr. Takuro NIIDOME	Nov. 29, 2022 – Jan. 27, 2023 On-site: Jan. 5, 2023 – Jan. 18, 2023
Ms. Qun CHEN, China ³	Dr. Gaochuang CAI	Dec. 21, 2022 – Jan. 20, 2023 (Online only)
Mr. Zhe ZHANG, China	Dr. Atsushi SAINOKI	Dec. 6, 2022 – Dec. 7, 2022 * (Online only)
Mr. Yang ZHAO, China	Dr. Atsushi SAINOKI	Dec. 6, 2022 – Dec. 7, 2022 * (Online only)

* The second phase (scheduled for March) has been postponed to FY2023 due to unavoidable reasons.
諸事情により3月に予定していた研修は2023年度に延期



Symposium, Seminar, etc.

シンポジウム・セミナー等の開催

International Symposium 国際シンポジウム	6 symposia	343 participants
International Seminar 国際セミナー	10 seminars	348 participants
Salon for the Future Cross-disciplinary Research 未来に向けた学際研究サロン	7 times	169 participants
IROAST Research Exchange Meeting 2022 IROAST研究交流会	2 meetings	61 participants

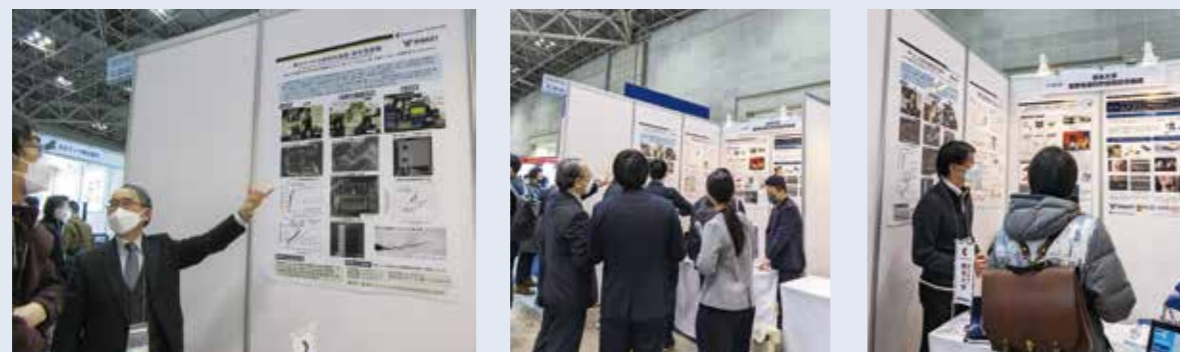


Presentation at International Exhibition

国際展示会への出展

Aiming to support the development of joint research with companies, IROAST exhibited the research of our research clusters, particularly in biosensors and MEMS materials, at the MEMS Sensing & System 2023.

企業との共同研究への展開を支援するため、特にバイオセンサー、MEMS材料に関する研究クラスターの研究内容を「MEMS センシング&ネットワークシステム展2023」で展示しました。



Overseas visit to explore new international collaboration

国際共同研究の展開のための海外訪問

To introduce IROAST activities and explore the possibility of future international cooperative research, Director Takashima visited the United Kingdom, Germany, and Australia in March 2023.

IROASTの活動を紹介し、新たな国際共同研究の可能性を拡げるため、高島研究機構長が2023年3月、イギリス、ドイツ、オーストラリアを訪問しました。



Visit to JSPS London, UK



Director Takashima's seminar at Karlsruhe Institute of Technology, Germany



Discussion with researchers at the University of Technology Sydney, Australia

IROAST PR Activities

広報活動

Aiming to increase brand awareness of IROAST, we published Japanese and English versions of our pamphlet, expanded our website (adding information in Japanese) (Photo 1), and disseminated information via social networking services. In addition, IROAST participated in the 1st Kumadai Hub Poster Session, the event of young researchers of the University (Photo 2).

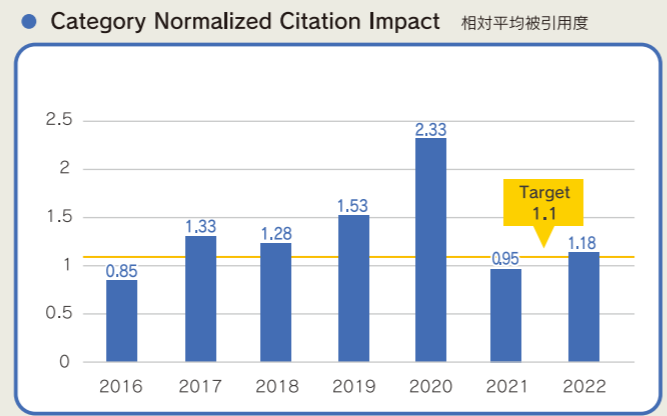
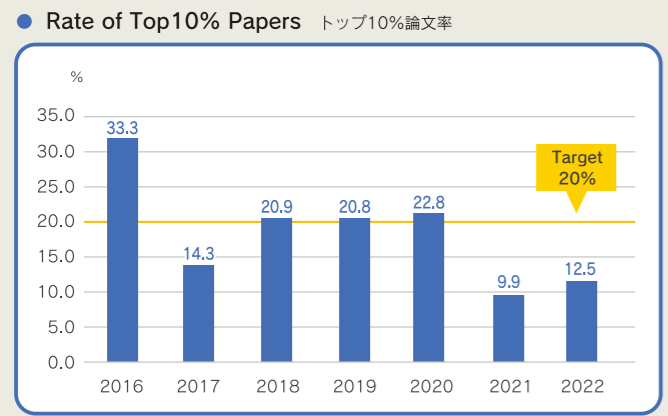
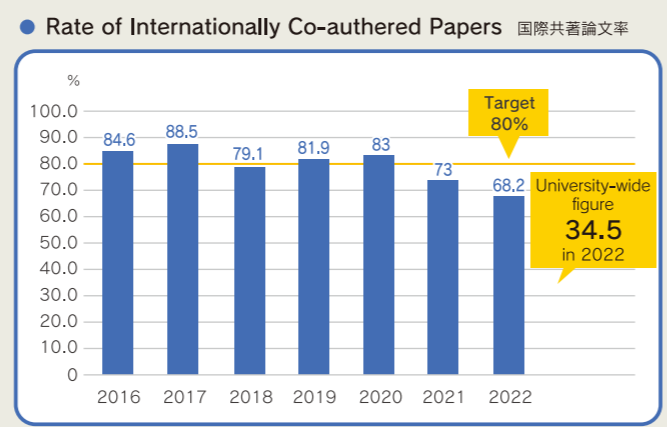
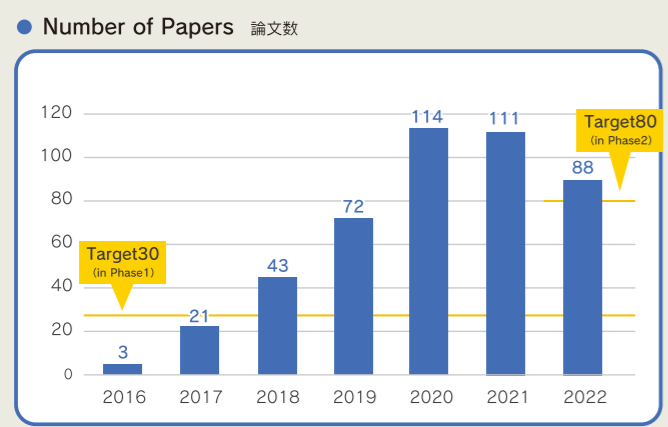
IROASTの認知度向上を目指し、パンフレットの日本語版・英語版の発行やホームページの拡充(日本語での情報発信も追加)(写真1)、SNSでの情報発信などを行いました。また大学内若手研究者のイベント、Kumadai Hub巡回ポスター展にも参加しました(写真2)。



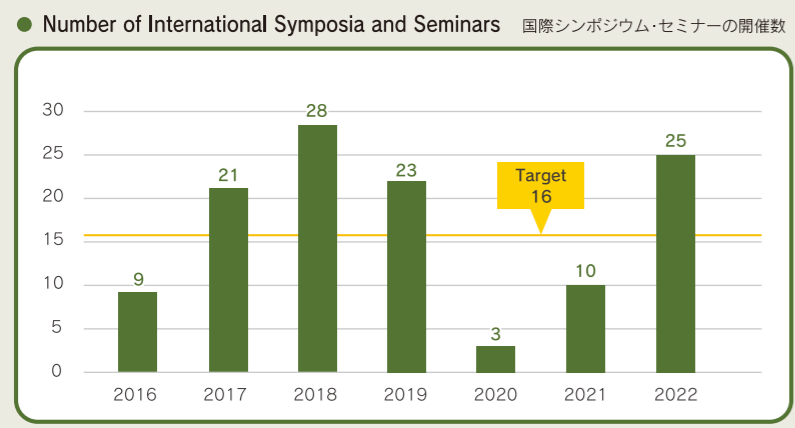
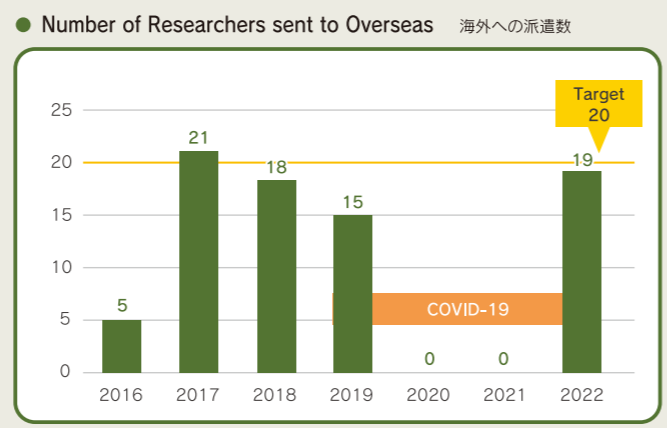
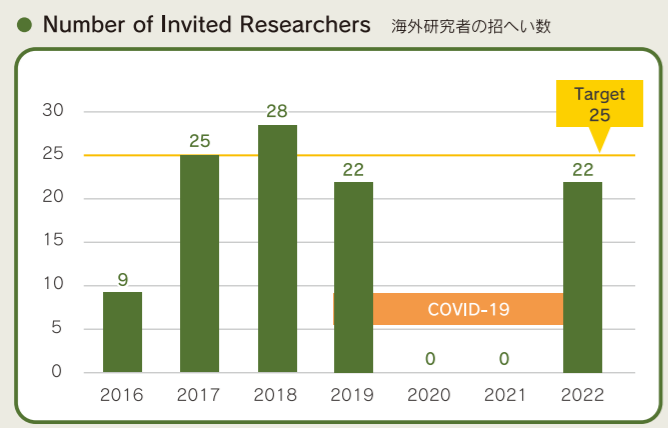
Statistics for IROAST Activities

IROAST 活動実績

IROAST Research Activities 研究成果

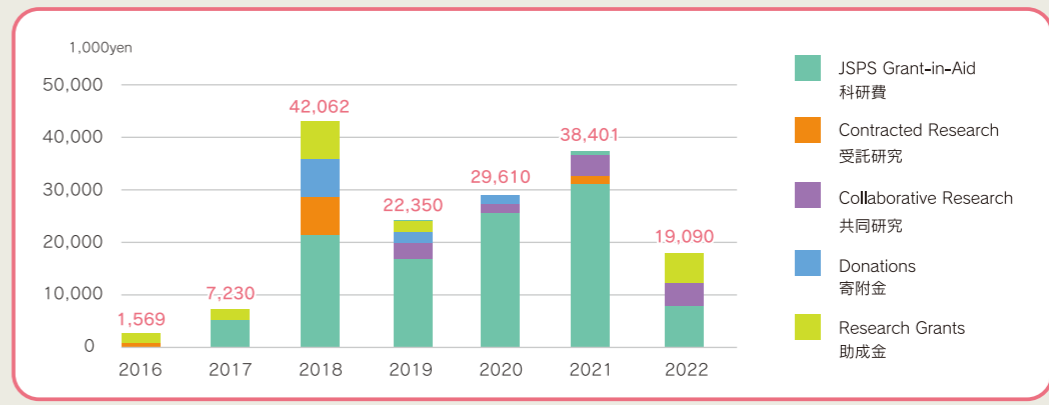


IROAST International Exchanges 国際交流



External Funds obtained by IROAST Faculty Members

IROAST 教員による外部資金獲得額



External Evaluation of the First Phase Achievements by the International Advisory Board

国際アドバイザー委員会による第一フェーズの成果に対する外部評価

The IROAST International Advisory Board members, who are experts with extensive experience in academic and research affairs, conducted hearings on the management and administration of IROAST and provided advice to aid the organization in becoming an internationally recognized research institution.

世界の学術・研究事情に精通し幅広い経験を持つ専門家による国際アドバイザーボード委員が、IROASTの管理・運営について意見聴取を行い、世界に開かれた研究機構となるための助言を行いました。

Held at Kumamoto University on Nov. 18, 2022 1

Dr. Dmitri Aleks MOLODOV	Professor, Institute of Physical Metallurgy and Metal Physics, RWTH Aachen University, Germany (IROAST Distinguished Professor)
Dr. László PUSZTAI	Scientific Advisor, Wigner Research Centre for Physics, Hungary (IROAST Distinguished Professor)

Held at the University of Birmingham, UK, on Mar. 8, 2023 2

Dr. Paul BOWEN	Feeney Professor of Metallurgy, School of Metallurgy and Materials, University of Birmingham, UK (IROAST Visiting Professor)
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Held at Karlsruhe Institute for Technology, Germany, on Mar. 10, 2023 3

Dr. Martin DIENWIEBEL	Heisenberg-Professor, Applied Nanotribology, Karlsruhe Institute for Technology (KIT), Germany (IROAST Visiting Professor)
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