International research projects and mobility with Europe at Tohoku University

Vice President
for Education Reform and Global Engagement
Masahiro Yamaguchi

EURAXESS Japan Tour 2018
September 3, 2018

Selected by major governmental programs for university reform

- 2013

Program for Promoting the Enhancement of Research Universities

- Reform of research environments
- 22 Institutes selected (approx. 350 million yen(3.3 million USD)/year, for 10 years)

- 2014

Top Global University Project (Type A)

- Reform to increase internationalization
- 13 Institutes selected (approx. 350 million yen(3.3 million USD)/year, for 10 years)

- 2017

Designated National University Corporation

- The new status provides the university with a better platform to further help improve communities at home and abroad.
- Only 3 Institutes selected (Tokyo U, Kyoto U and Tohoku U)

Concept as a Designated National University Corporation

Manifesting Leading Status ~ A Global Top-Thirty University

Leading Synergy of Excellence and Innovation

Creation of Knowledge via **Excellence** in Research & Education	Leading **Innovation** of Society & Economy

HR Education

Providing unique Degree Programs through advanced global joint programs

Governance Reform

Further Reinforcement of functionality based on advanced academic governance

Research Capabilities

4 World Leading Research Centers

Society Collaboration

Leading innovation through global industry-academia cooperation centers

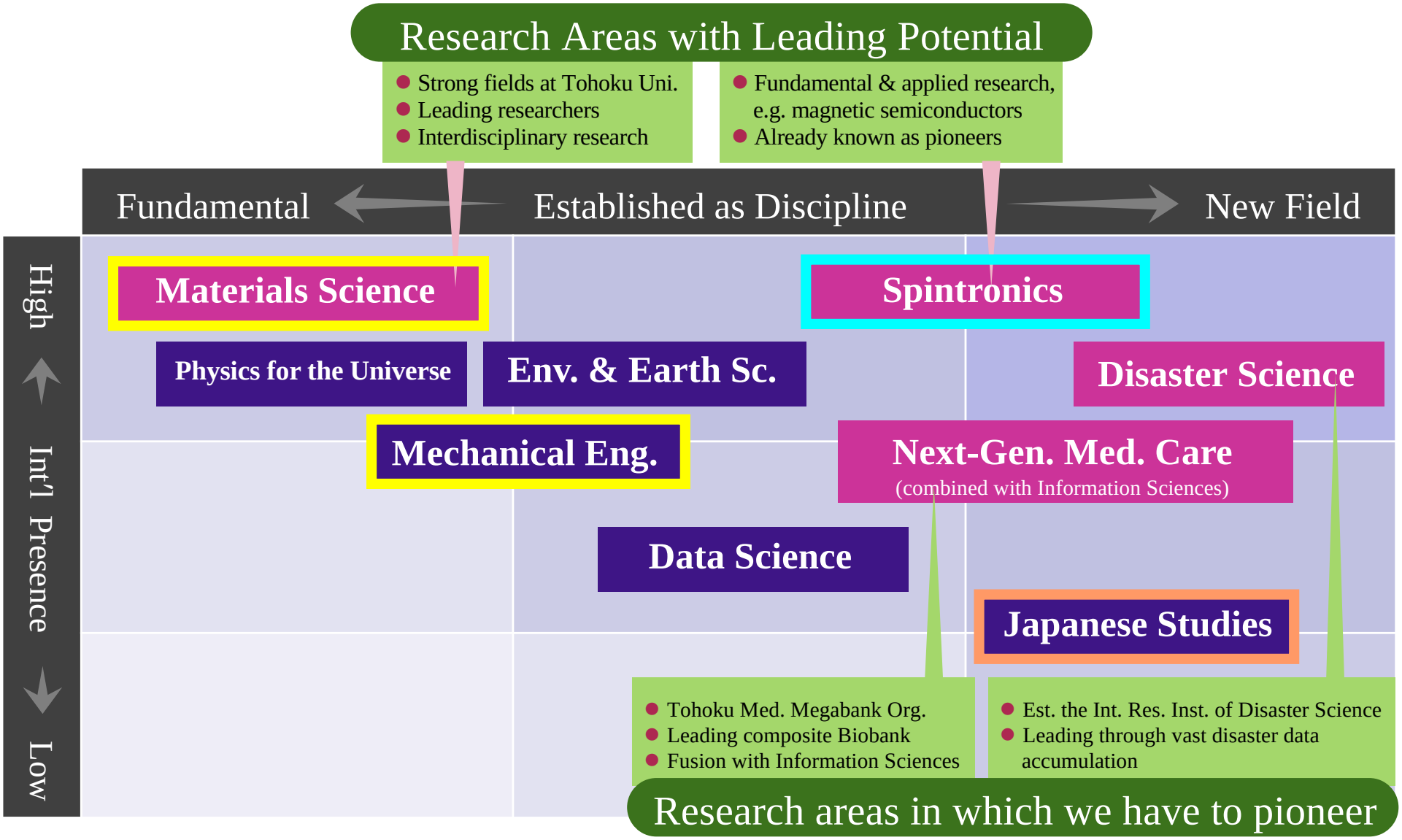
Issues & Requests

Drastic Improvement of International Presence

Functional reinforcement responding to various societal needs and issues

Priority Objective: World Leading Research Centers

- **Prioritized promotion of World Leading Research Centers in 4 research areas**
- **International Research Cluster in 9 fields with 5 other strong areas**



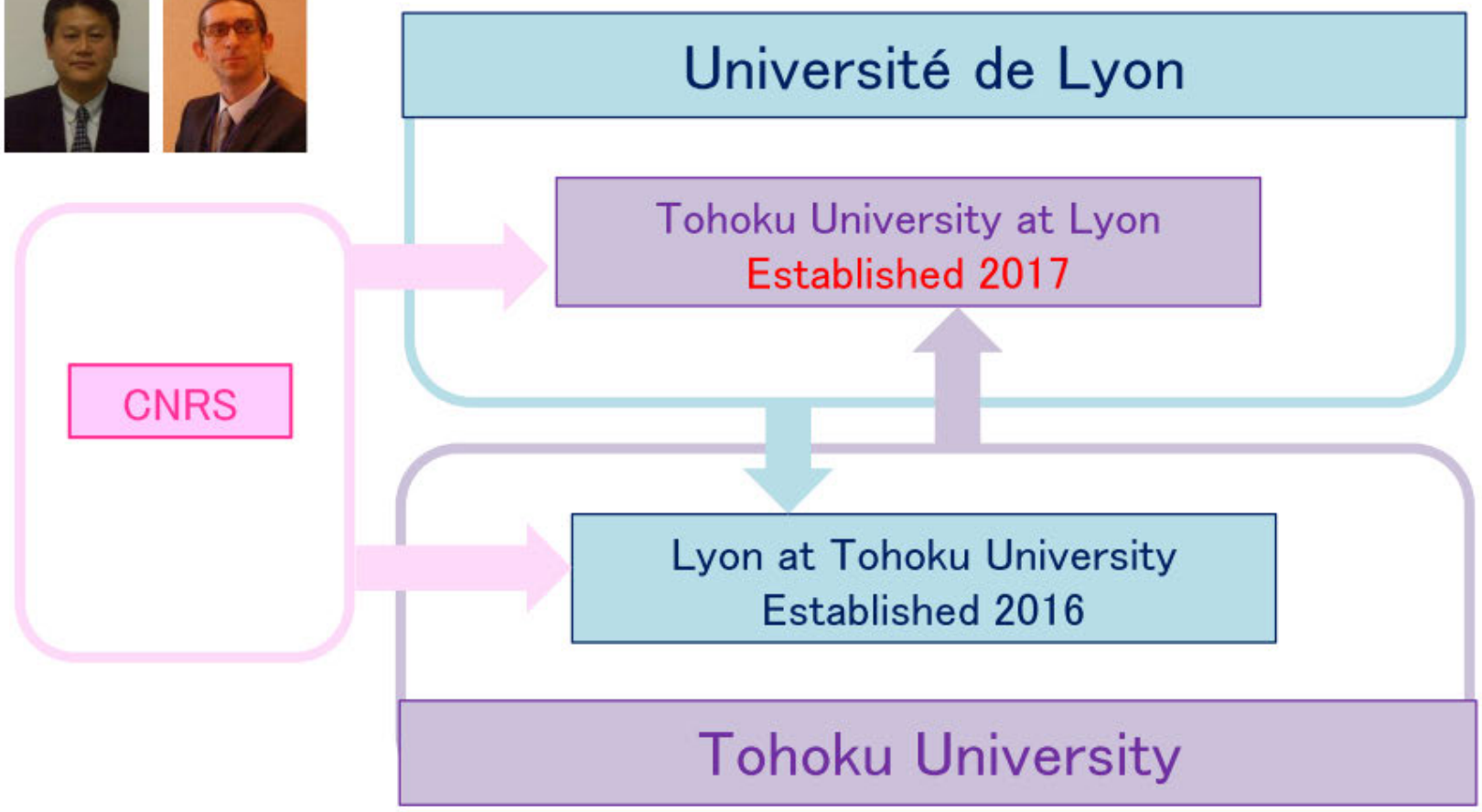
World Leading Research Centers:
Example 1. Materials Science and Mechanical Engineering 1

ELyT MaX

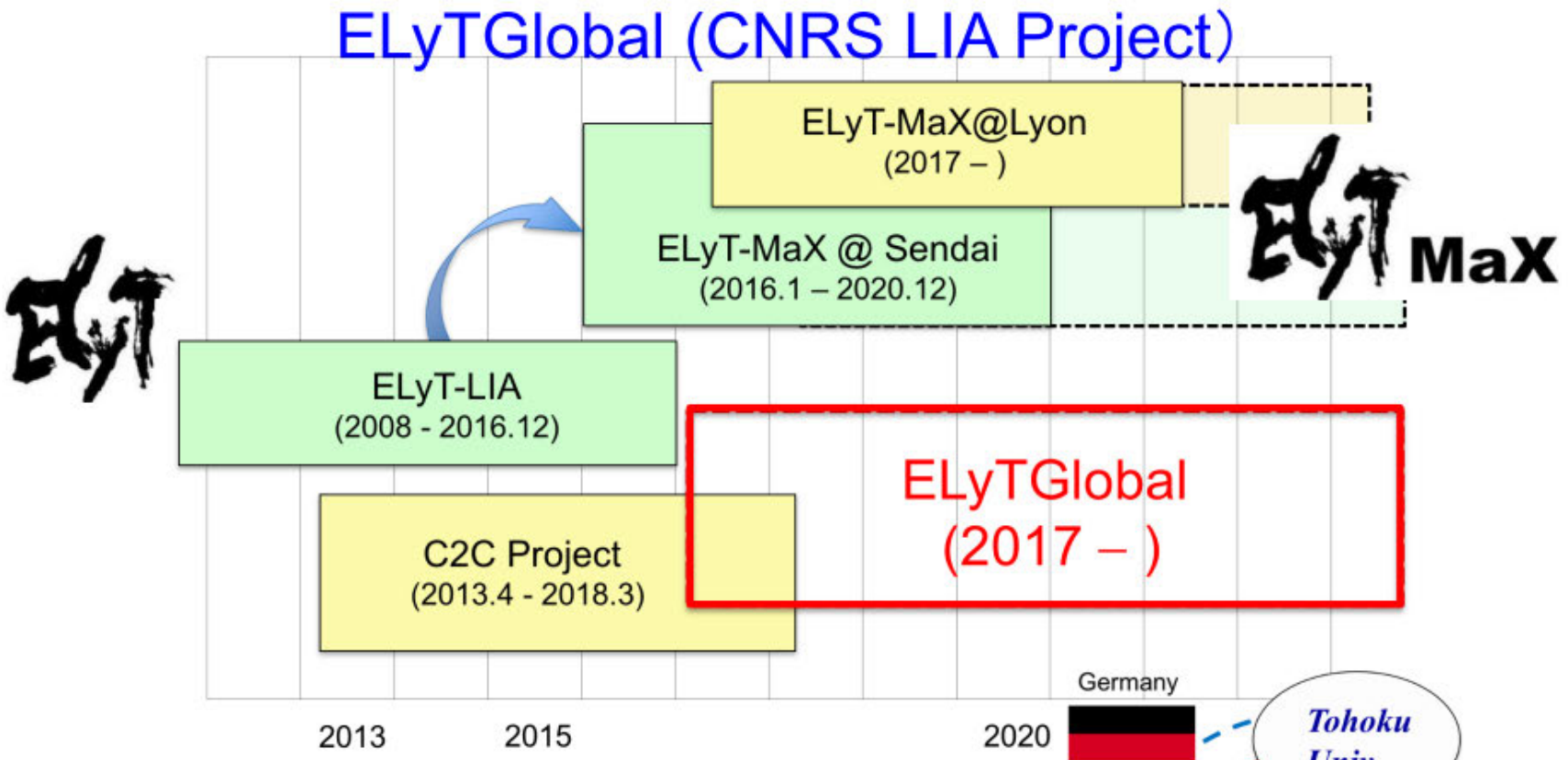
Japan-France joint research:
"Materials and Systems under Extreme Conditions"

Formation of a Japanese-French academia–industry cooperative regime, and the promotion of collaborative research, supported by a Japanese-French Joint Laboratory (ELyT Laboratory)

Co-leaders: Prof. G. Sebald (INSA-Lyon) & Prof. Kazuhiro Ogawa (Tohoku)



World Leading Research Centers:
Example 1. Materials Science and Mechanical Engineering 2

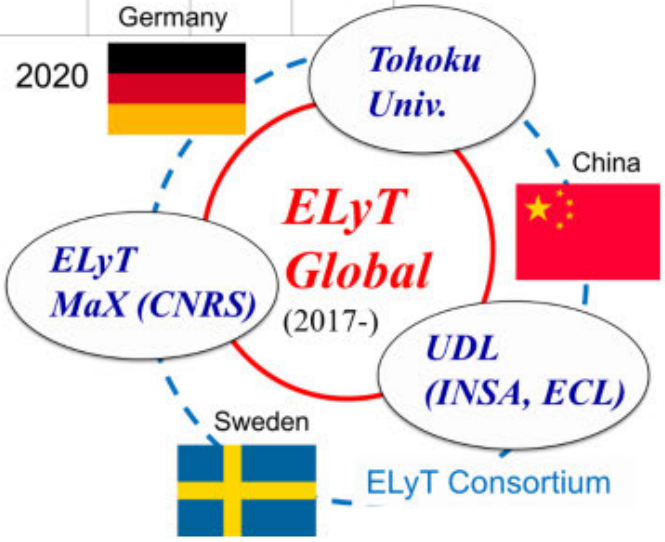


ELyTGlobal

Joint coordinators: J. Fontaine (ECL), Tetsuya Uchimoto (Tohoku)

Vice-coordinators: D. Fabregue (INSA-Lyon), Yutaka Sato (Tohoku)

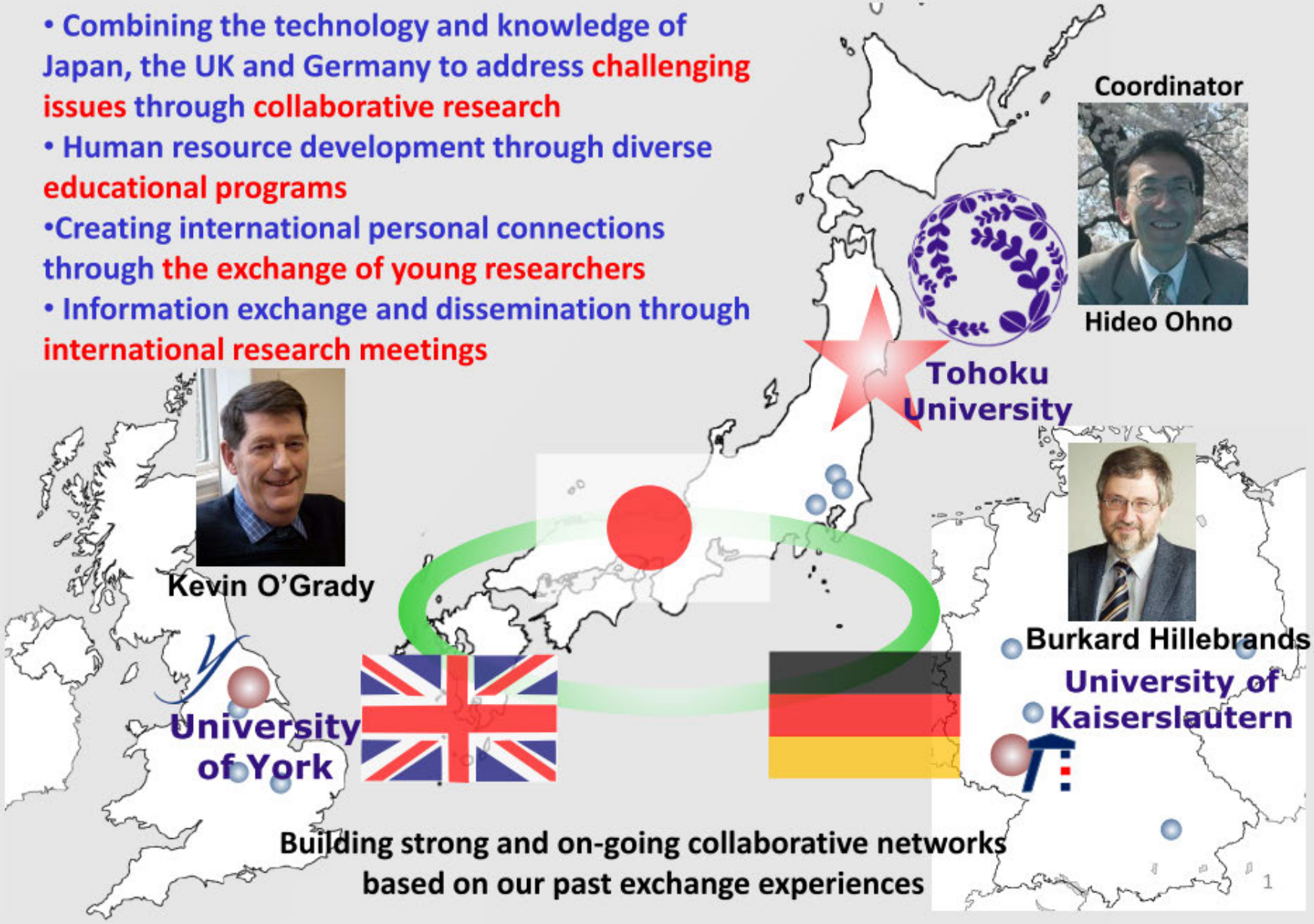
- Continuing to promote the collaborative research system in a wide range of fields formed through the ELyT project
- Based on cooperation between Tohoku University and the Lyon institutions, moving from Franco-Japan cooperation to multinational academia–industry collaborative research



World Leading Research Centers: Example 2. Spintronics 3

Formation of the International Research Center for New-concept Spintronics Devices

- Combining the technology and knowledge of Japan, the UK and Germany to address challenging issues through collaborative research
- Human resource development through diverse educational programs
- Creating international personal connections through the exchange of young researchers
- Information exchange and dissemination through international research meetings



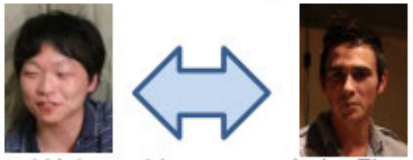
World Leading Research Centers: Example 2. Spintronics 1

1. Leading-edge and Important Research Exchange Activity

Achievements in international exchange

Tohoku University—University of York

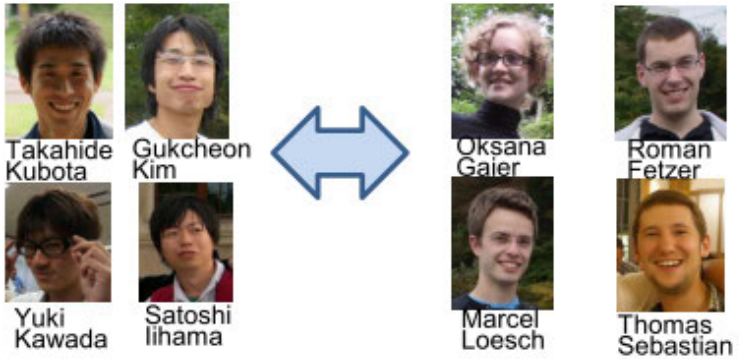
- Conclusion of an academic exchange agreement (2004)
- Japan Science and Technology Agency / Anglo–Japanese Strategic International Research Cooperative Program (2009-2011) (Hideo Ohno / Atsufumi Hirohata)
- Joint Research Seminars / International Symposia
  Venue: Tohoku University (2009), University of York (2011, 2013, 2015)
  Support from the Japan Society for the Promotion of Sciences London Office (2011, 2013)



Tohoku University—University of Kaiserslautern

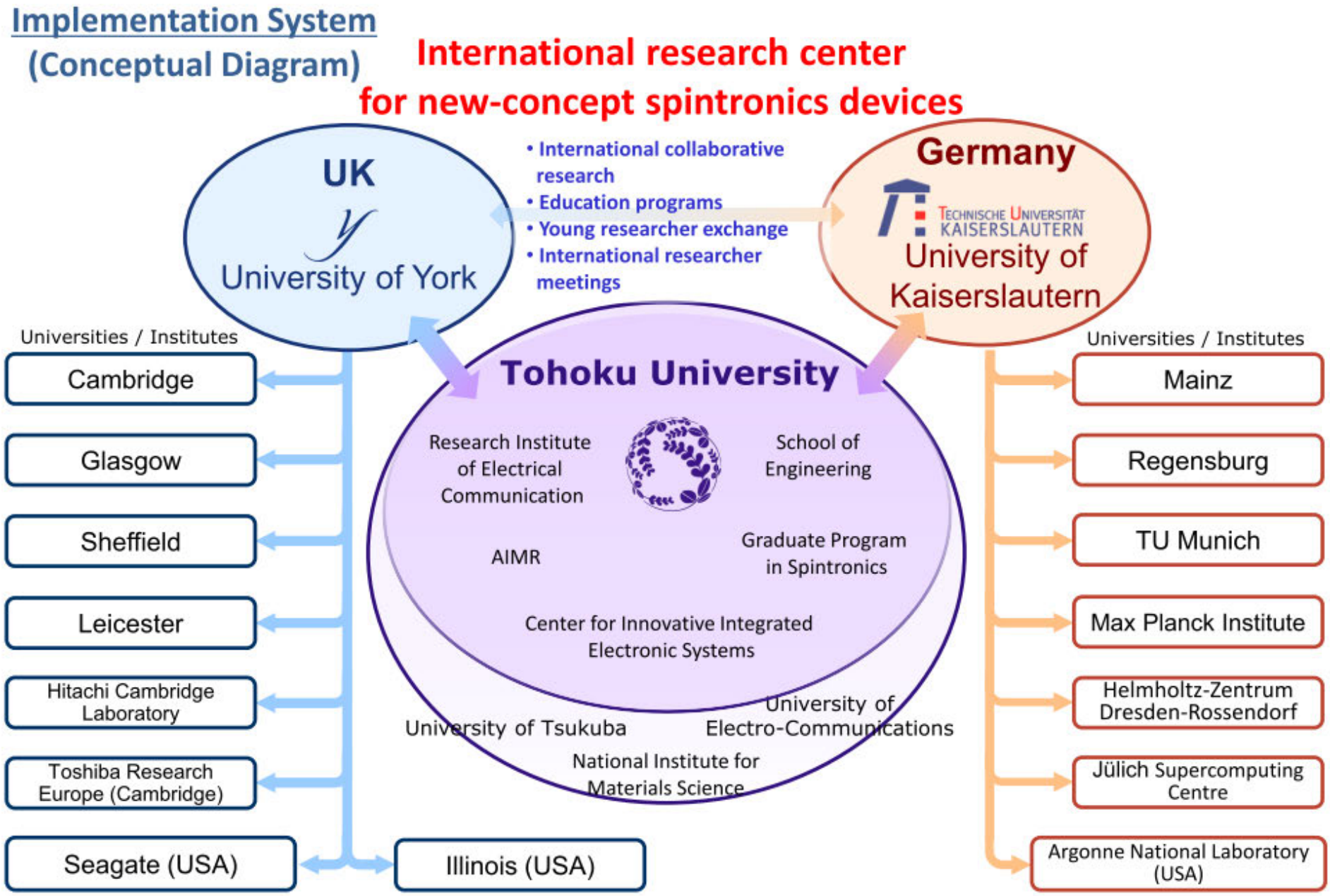
Student Exchange

- Conclusion of an academic exchange agreement (2012)
- Japan Science and Technology Agency
  Strategic International Research Cooperative Program
  Japanese-German collaborative research (2010-2014)
  （Yasuo Ando / Burkard Hillebrands）
- Annual Meetings / Summer Schools
  Venue: Tohoku University (2010, 2012, 2014),
  University of Kaiserslautern (2011), Max Planck Institute: Dresden (2013)



World Leading Research Centers: Example 2. Spintronics 2

2. Project implementation system and plans for domestic and overseas networks



World Leading Research Centers: Example 3. Japanese Studies 1

Conventional Japanese Studies

- In Japan・・・Research done in Japan, in Japanese, from a Japanese perspective → Closed off
- Outside Japan・・Area/language studies done chiefly in English from a Western perspective → Essentialist

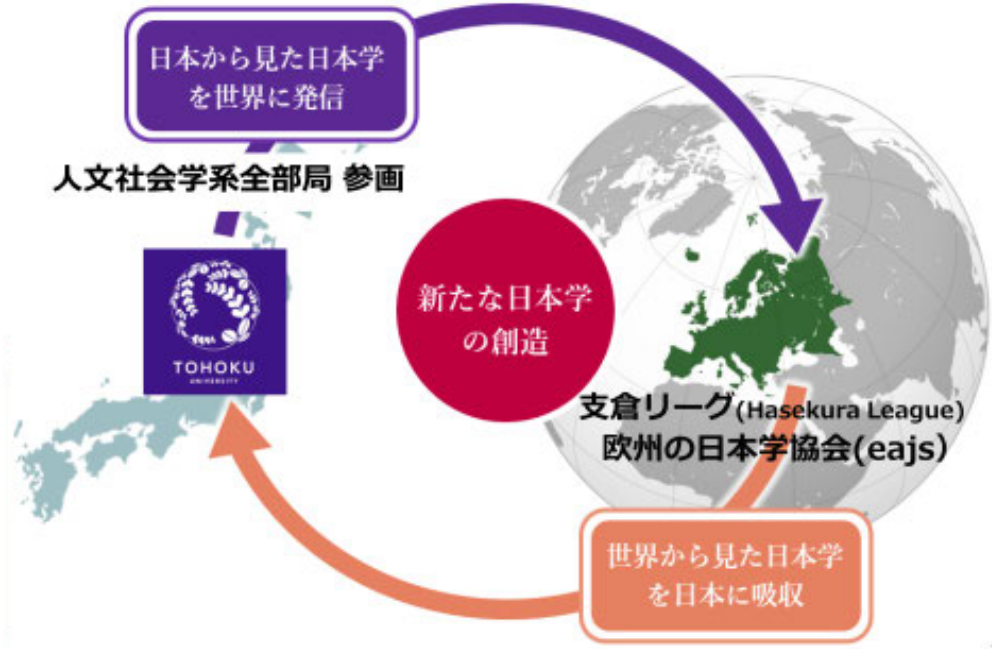
Constructing a platform for New Japanese Studies

The Creation of New Japanese Studies

◆New education based on two pillars ①Japan as object (area studies) ②Japan as method (Japanese methodology)

◆Transmit "Japanese studies in Japan" to the world, absorb "Japanese studies in the West" in Japan

Incorporating modes of thought and methodology from both Japan and the West to produce leaders who will tackle contemporary social problems



Hasekura League

A league composed of Tohoku University and 18 European universities in 9 countries launched by Tohoku University. Its most important characteristic is its innovative creation of a multilateral network in place of the standard bilateral relations between universities.

The only university in Japan to have a multilateral network of this scale with European universities

The league is creating "New Japan Studies" and engages in the following work to grapple with contemporary issues.

① Student Exchange
② Teacher/Administrative Staff Exchange
③ Academic Collaboration and Exchange

Member Universities (18 European universities)

・The University of Sheffield	・Ca' Foscari University of Venice
・Leiden University	・University of Padova
・Utrecht University	・University of Bologna
・Ghent University	・University of Florence
・Catholic University of Leuven	・Sapienza University of Rome
・Heidelberg University	・L'Orientale University of Naples
・University of Vienna	・University of Salamanca
・The Jagiellonian University	・Autonomous University of Madrid
・The Community Université Grenoble Alpes	・University of Granada

TFC: Tohoku Forum for Creativity's Achievements

The first international visitor research institute in Japan

	Thematic programs				Junior Research Programs	
2013	Particle Physics and Cosmology after the Discovery of the Higgs boson					
2014	Challenges for Big Data in our Society Statistical Analysis of Large Scale, High Dimensional Data for Socio-Economic Problems	A Health Informatics Infrastructure for a New Era	Recovery from the Great East Japan Earthquake and Tsunami Future Strategies for Disaster Risk Reduction			
2015	Frontiers of Brain Science	Fundamental Problems in Quantum Physics: Strings, Black Holes and Quantum Information	Spintronics: from Mathematics to Devices	The Effects of Technological Changes on Social Mobility and Income Distribution		
2016	Modern Interactions between Algebra, Geometry and Physics	Earth and Planetary Dynamics	Comprehensive Research on Materials, Systems and Energy for a Sustainable Future of the Earth	The 21st Century Hasekura Project: Japanese Studies as the Interface of a New Knowledge	Interdisciplinary Approaches to the Protection of Human Rights: Building Integrated Networks between Academic, State and Societal Actors	
2017	Aging Science: from Molecules to Society	Nonlinear Partial Differential Equations for Future Applications	New Horizons in Food Science via Agricultural Immunology		Nanostructured Magnetic Materials: Challenges for Next-Generation Materials	Political and Social Dynamics of Crisis and Innovation in Japan, Asia and the World
2018	Northeast Asian Colloquim: Geologic Stabilization and Human Adaptations ★	Tohoku Universal Acoustical Communication Month 2018 ★	Frontier of Chemical Communication ★	String-Math 2018 ★		

★ = Scheduled

TFC: Invited Outstanding Leading Researchers

FY2013

Barry Barish
Nobel laureate in Physics 2017

Steven Weinberg
Nobel laureate in Physics 1979

David Gross
Nobel laureate in Physics 2004

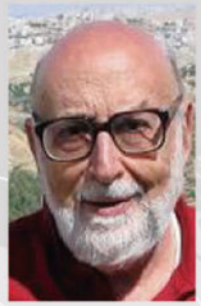
FY2014

Oliver Smithies
Nobel laureate in Physiology or Medicine 2007

Hiroshi Amano
Nobel laureate in Physics 2014

FY2015

Gerardus 't Hooft
Nobel laureate in Physics 1999



François Englert
Nobel laureate in Physics 2013

Martin Hairer
Fields Medalist 2014

Makoto Kobayashi
Nobel laureate in Physics 2008

FY2015

Susumu Tonegawa
Nobel laureate in Physiology or Medicine 1987

Koichi Tanaka
Nobel laureate in Chemistry 2002

Klaus von Klitzing
Nobel laureate in Physics 1985

FY2016

Edvard Ingjald Moser
Nobel laureate in Physiology or Medicine 2014

Maxim Kontsevich
Fields Medalist 1998

Shing-Tung Yau
Fields Medalist 1982

Peter A. Grünberg
Nobel laureate in Physics 2007

FY2017

Takaaki Kajita
Nobel laureate in Physics 2015

Mitsuhiro Yanagida
Recipient of Order of Culture 2011

TFC: Special Lecture on the 5th Anniversary 1
The Man from the 9 Dimensions

東北大学知のフォーラム　5周年記念特別講演会

Tohoku Forum for Creativity Thematic Program 2018

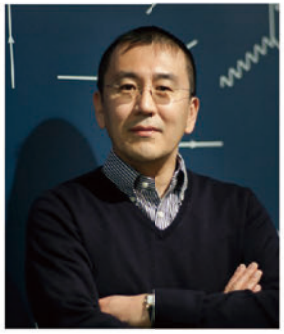
STRING-MATH 2018

大栗 博司 レクチャー

9次元からきた男とは何者か?

■ 同日 映画「9次元からきた男」上映 ■

『9次元からきた男』は、物理学の究極の目標といわれる「万物の理論」をテーマに、今まで誰も見たことのないエンターテインメント作品を作ろうという企画で始まりました。一昨年東京で公開されて以来、国際プラネタリウム協会の2016年度最優秀教育作品賞など数々の賞を受賞し、米国、ヨーロッパ、インド、中国など全世界で上映されています。素粒子の活躍するミクロな世界から、星や銀河のマクロな世界、さらには宇宙の始まりであるビッグバンまでを、科学の最先端の知識と最高の映像技術で紹介します。映画上映に先立ち、科学監修を務めた大栗博司氏が、この映像作品の科学的意義について解説します。



講師 **大栗 博司** 氏　*Hirosi Ooguri*

カリフォルニア工科大学フレッド・カブリ冠教授・理論物理学研究所所長、東京大学カブリ数物連携宇宙研究機構主任研究者、アスペン物理学センター所長。アメリカ数学会アイゼンバッド賞、ドイツ連邦共和国フンボルト賞、仁科記念賞などを受賞。アメリカ芸術科学アカデミー会員。また、一般向けの啓蒙書の執筆に対し、講談社科学出版賞を受賞。

参加費無料　定員90名(先着順・要申込)

2018年6月23日(土) 10:00-11:30 (開場 9:30)

会場：東北大学 片平キャンパス 知の館 (TOKYO ELECTRON House of Creativity)

■ 主催：東北大学研究推進・支援機構知の創出センター　東京エレクトロン株式会社

■ お問い合わせ：東北大学知の創出センター事務室　TEL：022-217-6091　FAX：022-217-6097　Email：creativity@ml.tohoku.ac.jp

お申し込み方法

WEBサイトの申込フォームまたはFAXにて、氏名・職業・年齢・連絡先メールアドレス(FAXでお申込みの場合は電話番号)・参加希望人数をご記入の上、お申し込みください。

URL　www.tfc.tohoku.ac.jp/5th-anniv/ooguri/

FAX　022-217-6097

会場へのアクセス

東北大学 知の館 (TOKYO ELECTRON House of Creativity)

〒980-8577　仙台市青葉区片平2丁目1-1(東北大学片平キャンパス内)

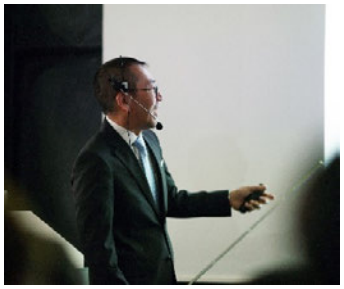
・青葉通一番町駅(仙台地下鉄東西線)南1口より徒歩約10分

・仙台駅(JR)西口より徒歩約15分

[注意]キャンパス内に駐車場はございません。
もよりの公共交通機関をご利用の上、ご来場ください。

String-Math 2018 Sponsors

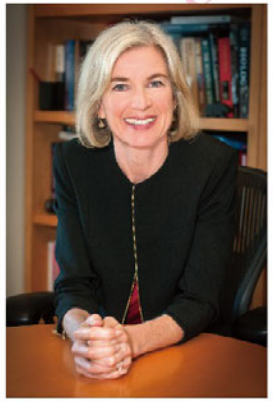
TEL　CHI　JSPS　KAVLI　IPMU　OSU　SIMONS FOUNDATION　THE TOKYO CLUB　Sendai Tourism, Convention and International Association



TFC: Special Lecture on the 5th Anniversary 2
Genome Editing

Genome Editing

Special Lecture on the 5th Anniversary of the Tohoku Forum for Creativity



Invited Speakers

Jennifer A. Doudna
University of California, Howard Hughes Medical Institute

"CRISPR Systems: Biology and Applications of Gene Editing"

Dr. Doudna, a UC Berkeley professor of molecular and cell biology and of chemistry and a Howard Hughes Medical Institute investigator, combines biochemistry and structural biology to understand the function of catalytic and other non-protein-coding RNAs, or ribonucleic acids. She has shown how these molecules carry out complex activities in cells and are uniquely capable of encoding and controlling the expression of genetic information.

Ongoing projects are focused on delivery of Cas9 protein-RNA complexes into specific tissues, as well as discovery of the mechanisms of target search and binding in live cells. We are also working on other aspects of CRISPR biology, including the pathway for acquisition of new sequences into CRISPR loci, and the structures and mechanisms of other CRISPR targeting complexes, including the RNA-targeting Cmr and Csm complexes.

Yoshizumi Ishino
Kyushu University
"Encounter with a mysterious repeated DNA sequence in 1986"

Mikiko Shiomi
University of Tokyo
"piRNA biogenesis in Drosophila"

Asako Sugimoto
Tohoku University
"Revisiting the "multi-tubulin hypothesis" using CRISPR/Cas9 genome editing"

Masanobu Morita
Tohoku University
"CRISPR/Cas system reveals novel moonlight functions of mitochondrial proteins"

Sun. 29 July, 2018 13:00-17:30

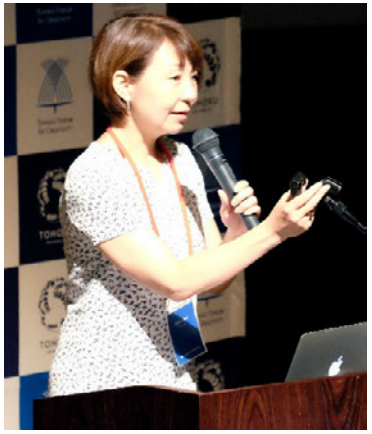
Venue: Tohoku University Centennial Hall (Kawauchi Hagi Hall)
Tohoku University, Kawauchi Campus | 40 Kawauchi, Aoba-ku, Sendai, Miyagi, Japan 980-8576

■ Hosted by: Tohoku Forum for Creativity, Tohoku University
■ Supported by: Tohoku Medical Society
Tokyo Electron Limited

More details on
http://www.tfc.tohoku.ac.jp/5th-anniv/doudna/

Call for poster presentation
See the website









Thank you for your attention