RIKEN Interdisciplinary Theoretical and Mathematical Sciences Program

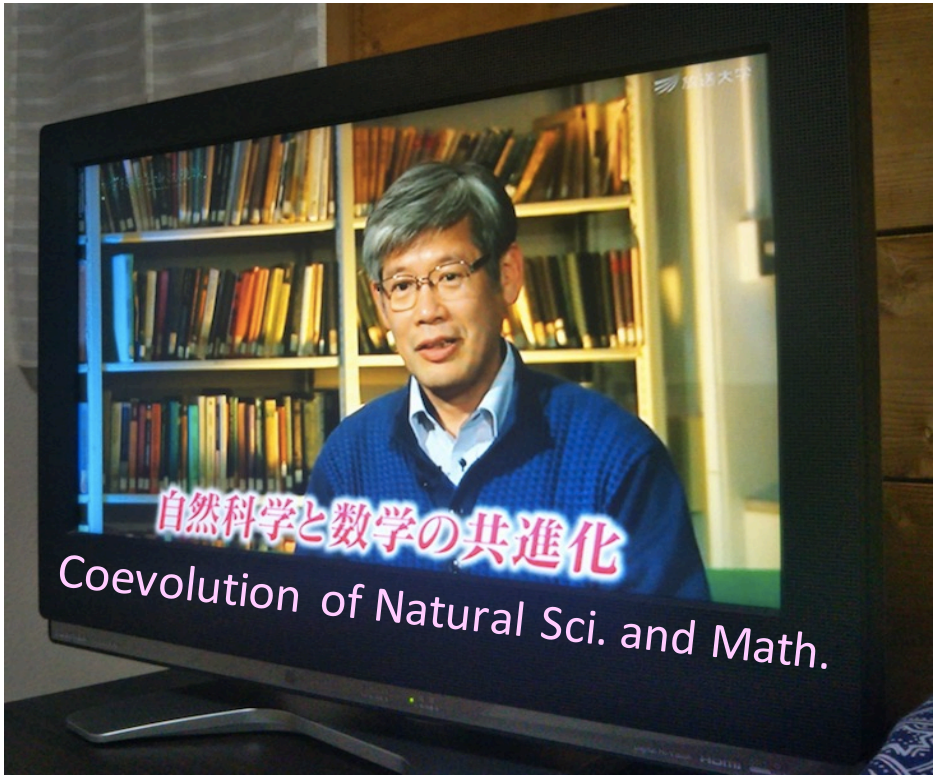
2016-2025-…

iTHEMS

https://ithems.riken.jp/en

Tetsuo Hatsuda

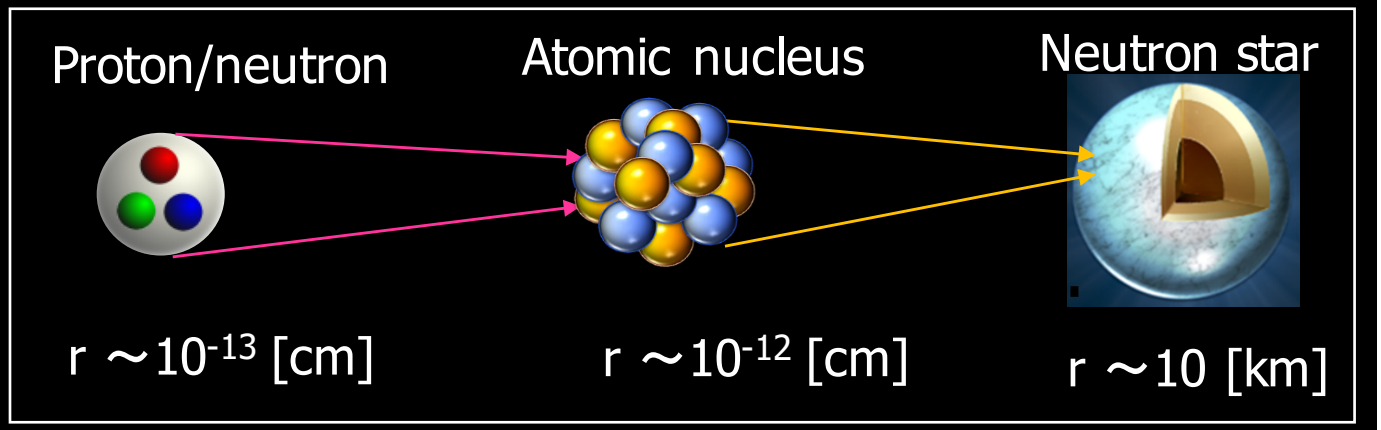
RIKEN iTHEMS
Program Director



July 4 2018

I am a Theoretical Physicist,
working on "quarks"

$$\mathcal{L} = -\frac{1}{4}G^a_{\mu\nu}G^{\mu\nu}_a + \bar{q}\gamma^\mu(i\partial_\mu - gt^a A^a_\mu)q - m\bar{q}q$$



Now, I am a Theoretical Biologist too,
working on "fish retina"
with biology colleagues in iTHEMS.

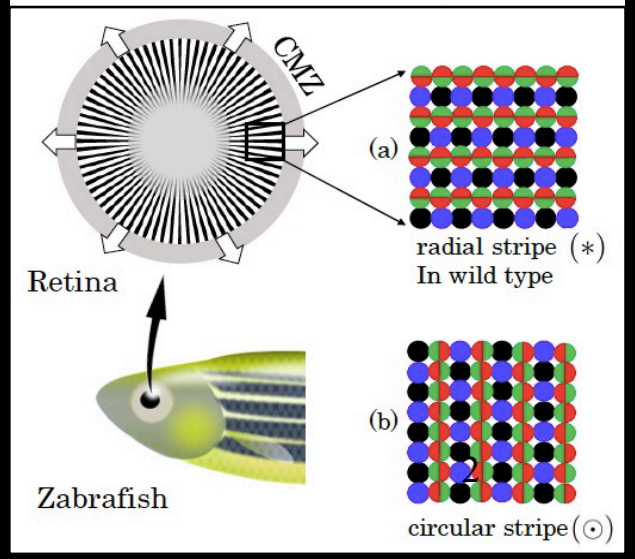
arXiv:1610.03596 [q-bio.CB] published in Phys. Ver. E (2017)

Theoretical physicists

Theoretical biologists

$$T_{ij} = \frac{p_i e^{-\beta\mathcal{E}_{ij}}}{N_j}, \quad N_j = \sum_i p_i e^{-\beta\mathcal{E}_{ij}},$$

$$\mathcal{E}_{ij}(\sigma,\sigma') = -B_i^{(\mathrm{intra})} - B_{ij}^{(\mathrm{inter})} \leq 0.$$



About RIKEN

http://www.riken.jp/en/about/

- Largest national research institute in Japan (established in 1917)

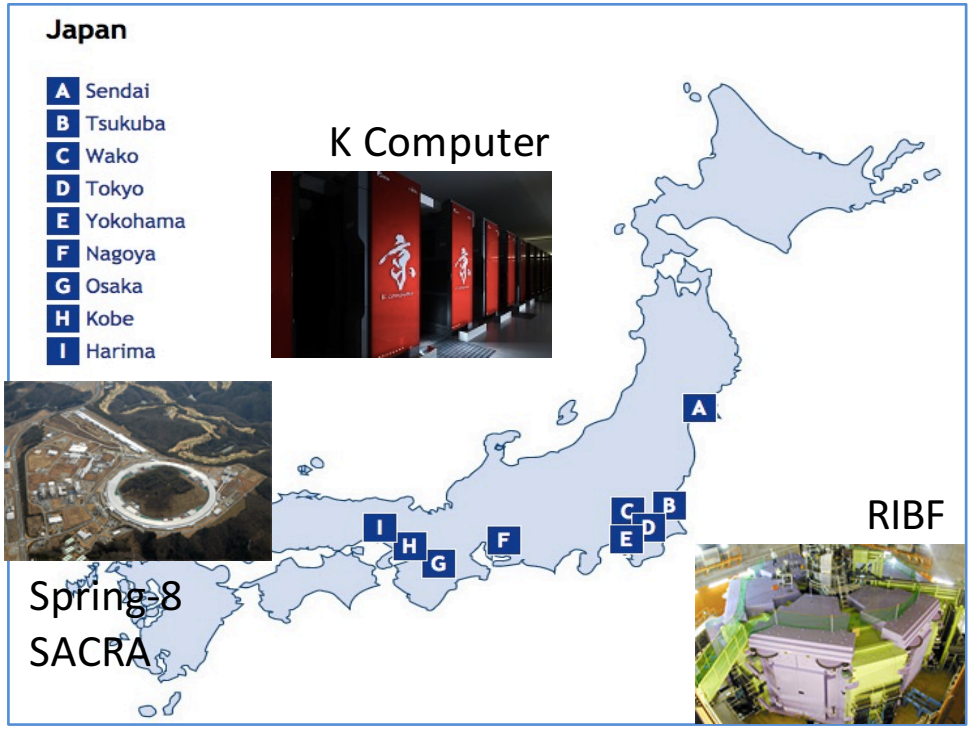
  Researchers： 3560 (21% non-Japanese)
  Branches： 9 domestic and 4 overseas
  Budget: 907M USD (FY2018)

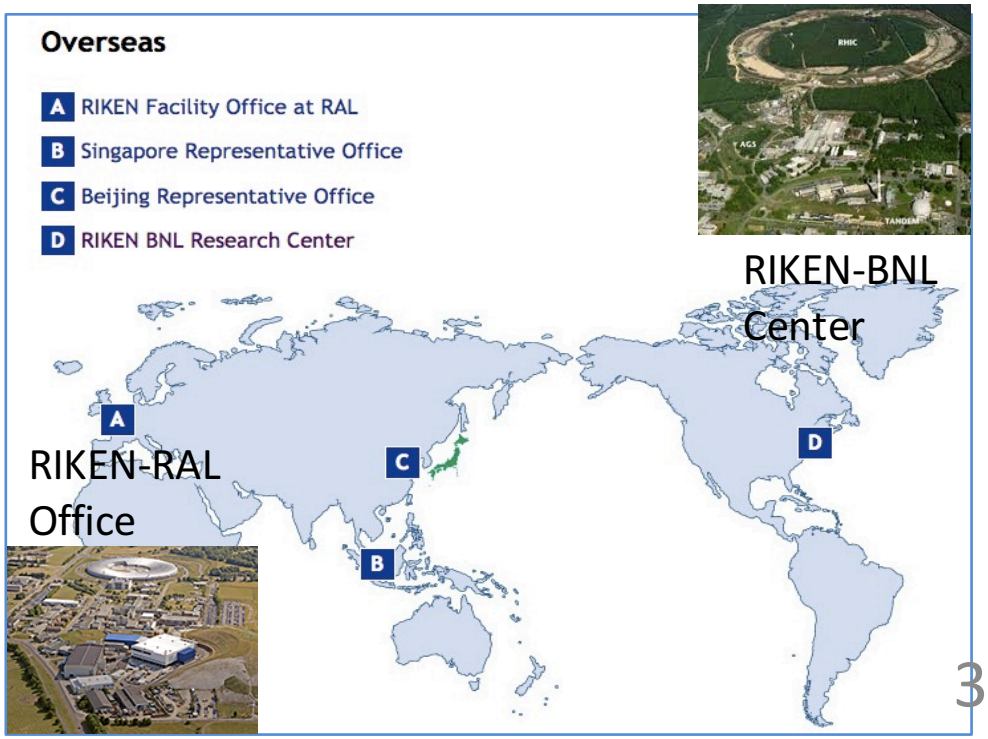
- Covering Phys, Math, Chemistry, Engineering, and Life/Medical Sciences

  Low barriers among different disciplines

- Operating leading Japanese facilities

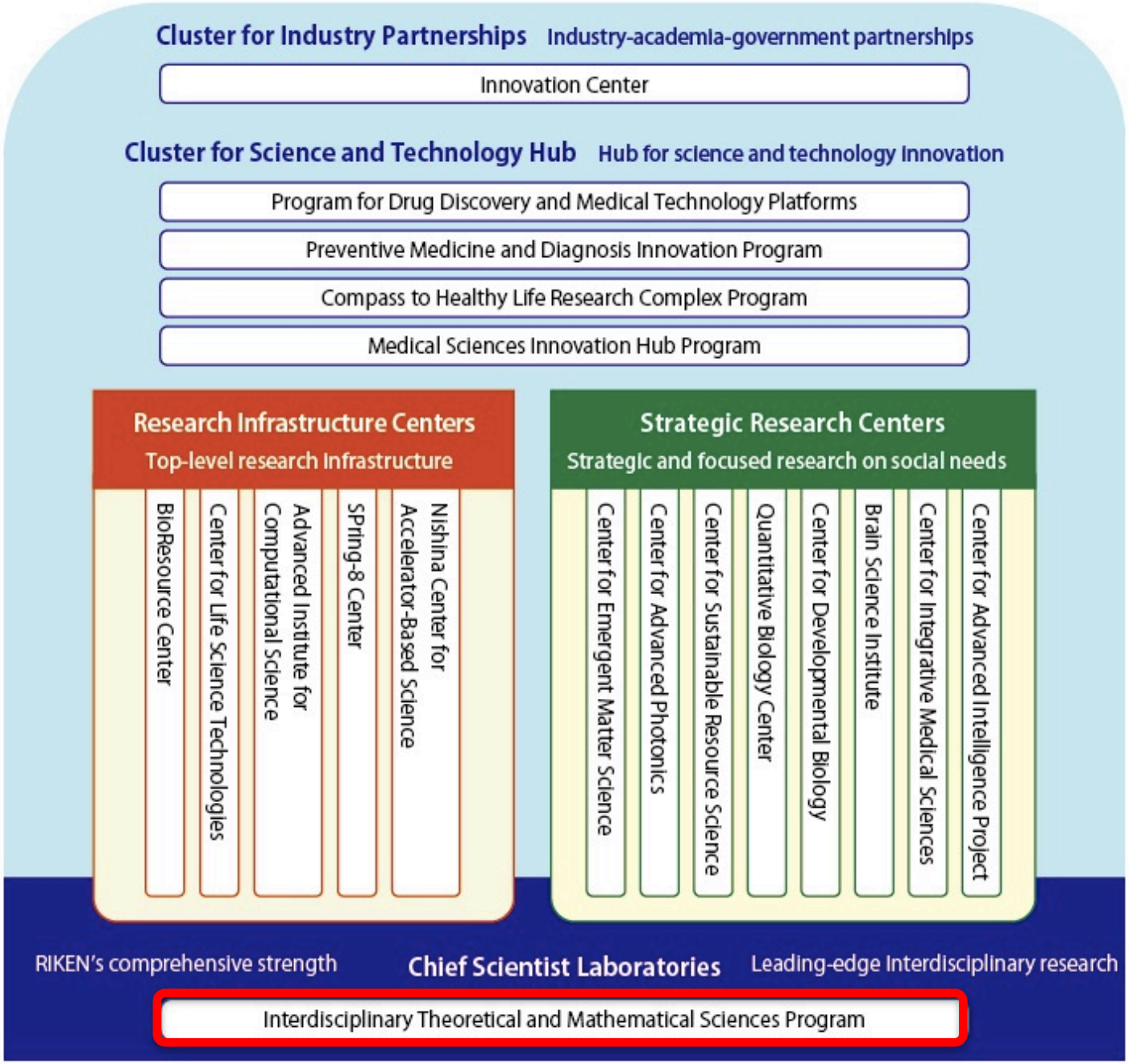
  K (11PFlops super computer), SPring-8 (Synchrotron radiation facility), SACRA (X-ray FEL facility), RIBF (Radioactive isotope beam facility)



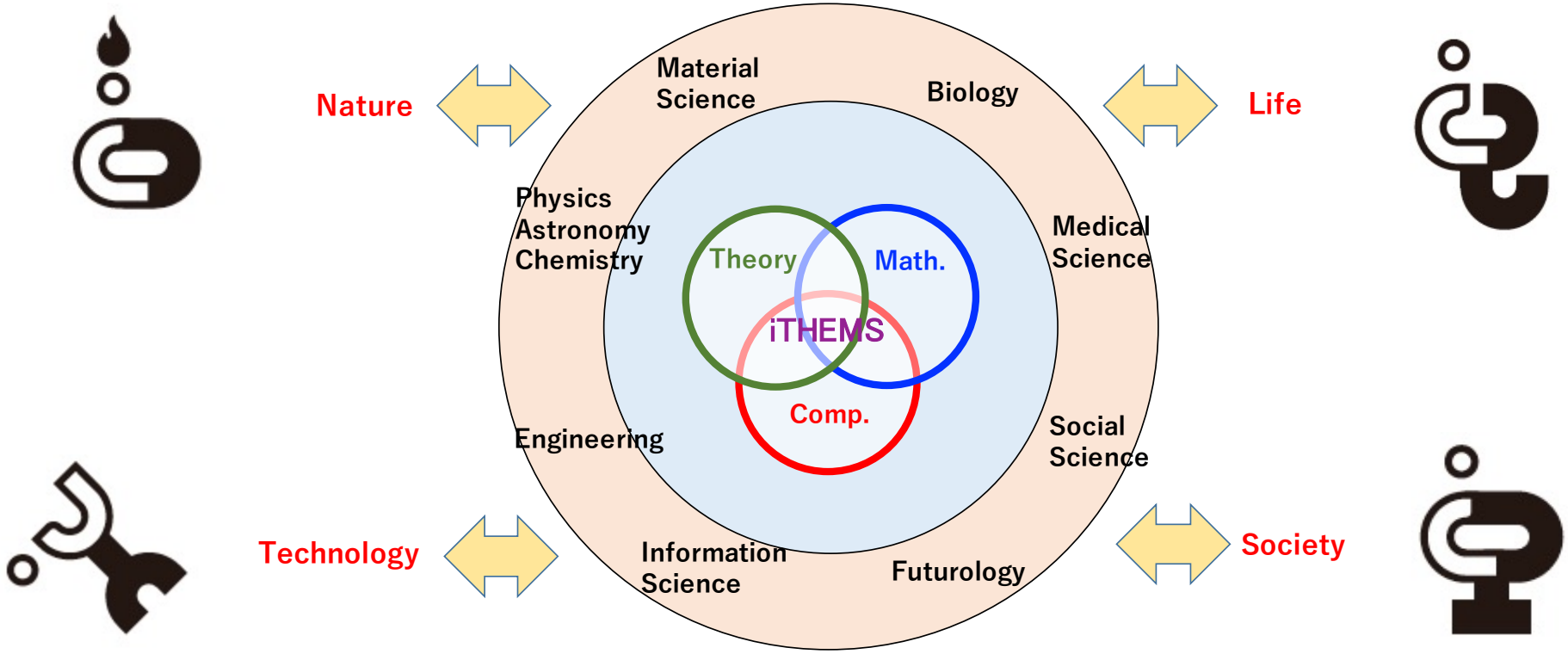


RIKEN Structure

http://www.riken.jp/en/research/overview//

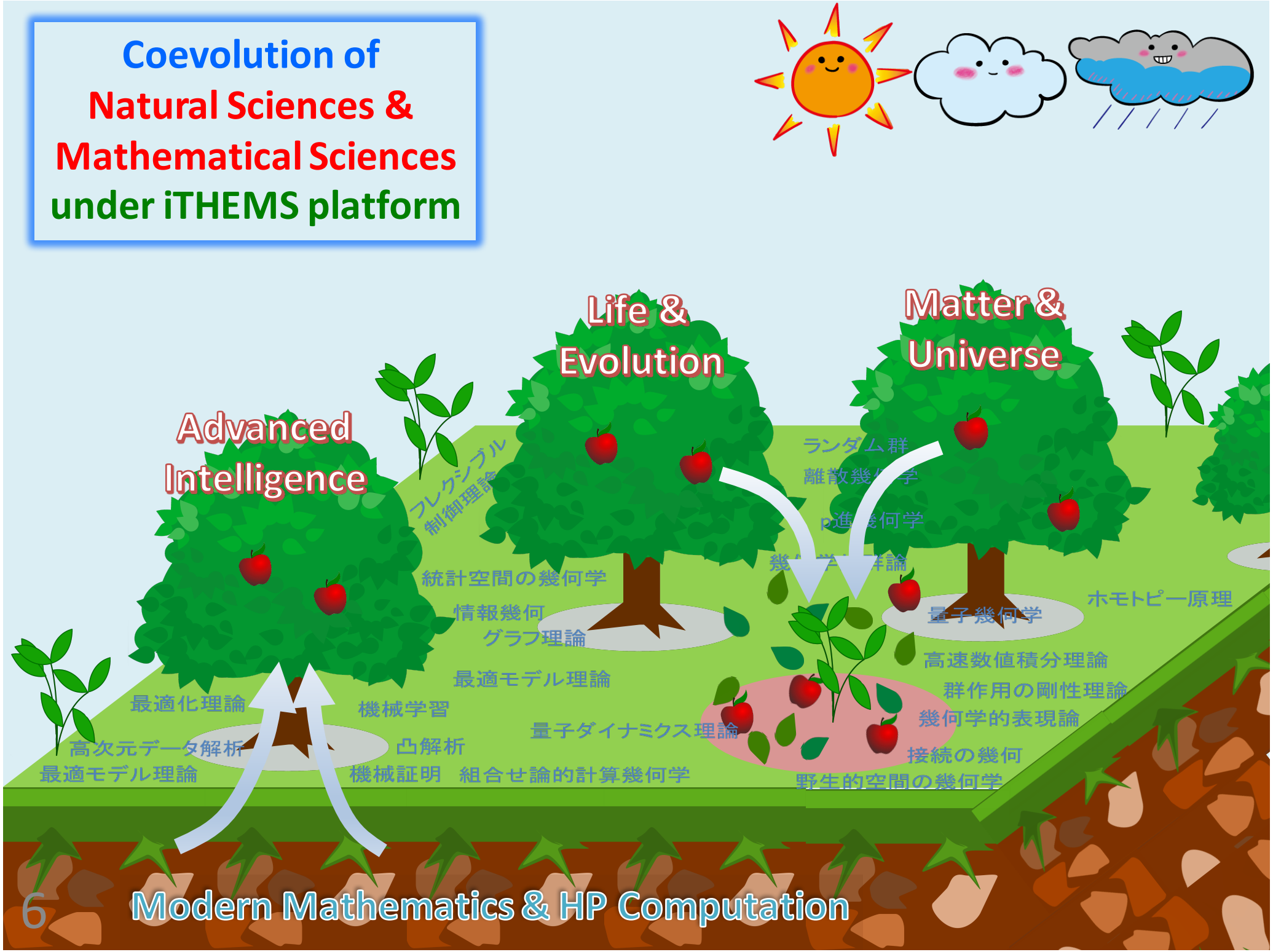


iTHEMS RIKEN interdisciplinary Theoretical & Mathematical Sciences



The ultimate goal of iTHEMS is to unravel the mystery of the Universe, matter, and life, as well as to solve key problems in modern society through interdisciplinary approaches.

Coevolution of Natural Sciences & Mathematical Sciences under iTHEMS platform



iTHEMS Members (2018-)

Director

T. Hatsuda
Phys.

Deputy Director

A. Mochizuki
Bio

S. Nagataki
Astro

T. Miyoshi
Comp

T. Tsuboi
Math

Coordinator

T. Tada
Phys

Science Advisor

Y. Iwasa
Bio.

S. Mori
Math

M. Kobayashi
Phys.

M. Kotanii
Math

iTHEMS Senior Fellows

G. Baym
(UIUC)
Physics

C. Beauchemin
(Ryerson U.)
Biology

K. Aihara
(Tokyo)
Eng.

K. Fukaya
(SBU)
Math

Kyoto Satellite

K. Kokubu
(Kyoto)
Math.

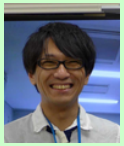
Sendai Satellite

H. Suito
(Tohoku)
App.Math

Berkeley Satellite

W. Haxton
(UCB/LBL)
Astro.

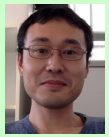
iTHEMS Junior Fellows



M. Taki
A.I.

Y. Inoue
Astro.

Y. Yokokura
Phys.



T. Ozawa
Phys.

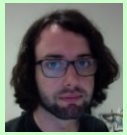
J. Fawcett
Bio.

T. Okada
Bio.

Y. Hidaka
Phys.

T. Doi
Comp.

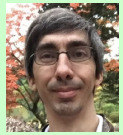
M. Tachikawa
Bio.



C. Bourne
Math.

K. Sakakibara
App. Math

Y. Kubota
Math,



D. Warren
Astro.

J. Chang
Comp.

G. Kurosawa
Bio.

T. Kuwahara
Phys.

N. Otsuka
Data Sci.

S.Kotsuki
Data Sci.

Y. Kotorii
Math.

A. Tanaka
A.I.

M. Strzys
Astro.

iTHEMS Postdoc Fellows

M. Hongo
Phys.

S. Furusawa
Astro.

A.I. Suriajaya
Math.

G. Ouchi
Math

M. Nozaki
Phys.

H. Miyazaki
Math

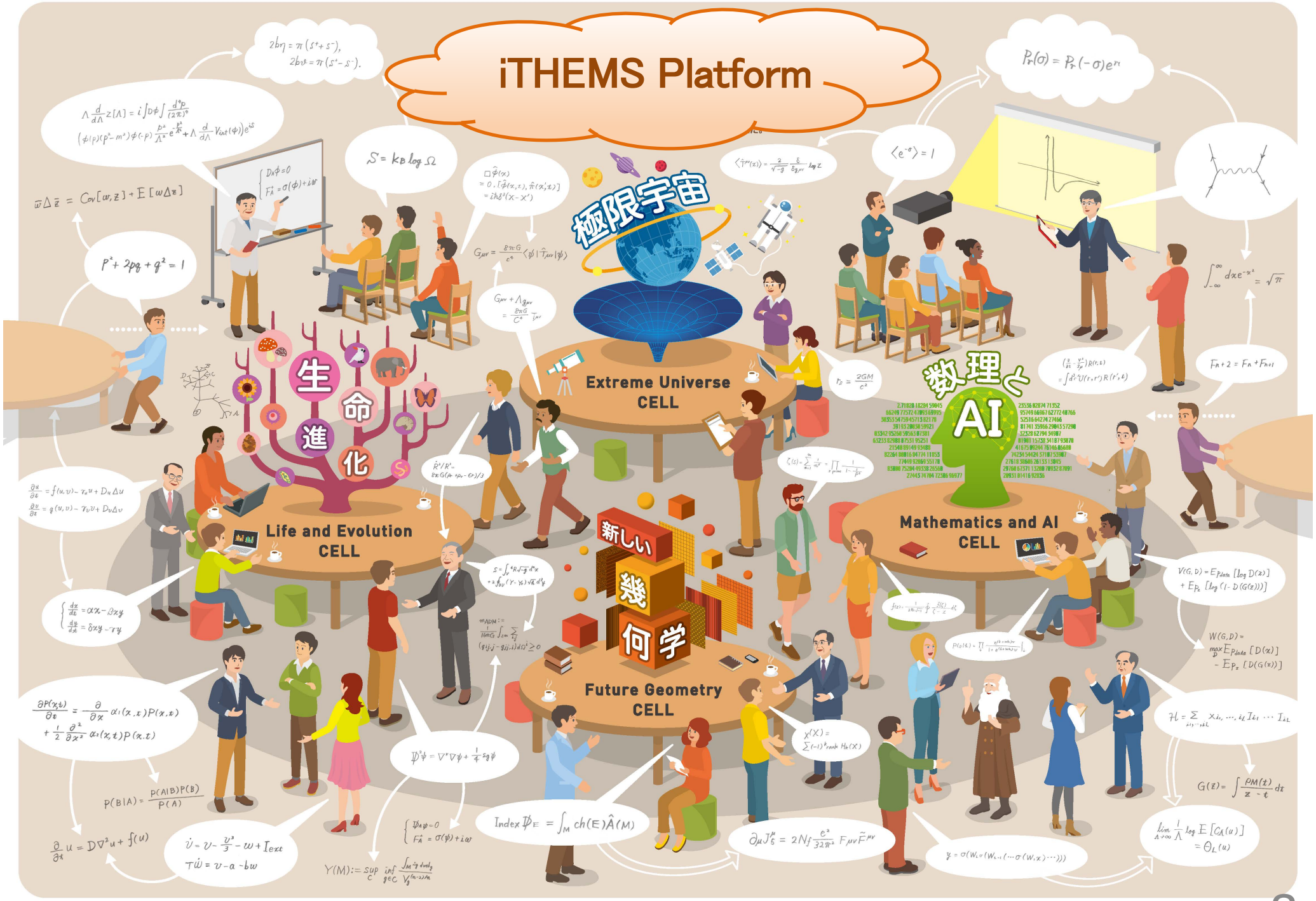
Grad. Student

K. Fujii
Phys.

Visiting Scientists

K. Fujikawa
Phys.

K. Yazaki
Phys.

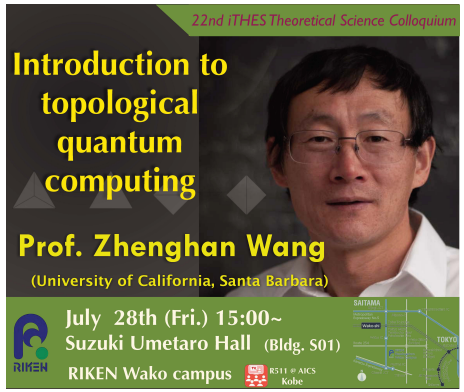

iTHEMS Platform
極限宇宙
Extreme Universe CELL
生命進化
Life and Evolution CELL
数理とAI
Mathematics and AI CELL
新しい幾何学
Future Geometry CELL

iTHEMS Activities

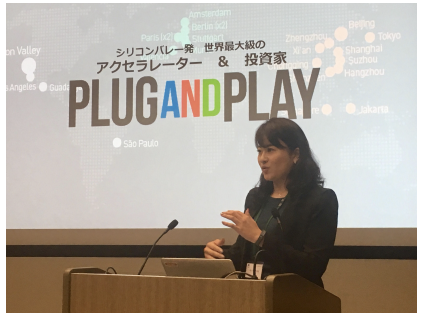
iTHEMS Research

https://ithems.riken.jp/en

- iTHEMS Colloquium every 2 months
- Innovation Lecture every 2 months
- Coffee meeting every Friday 12:30-14:00
- Wine meeting every last Friday 18:00-
- Newsletter every Monday
- Lectures
- Seminars, workshops and conferences



Colloquium



Innovation Lecture

Coffee meeting

Wine meeting

iTHEMS Satellite Offices: SUURI-COOL

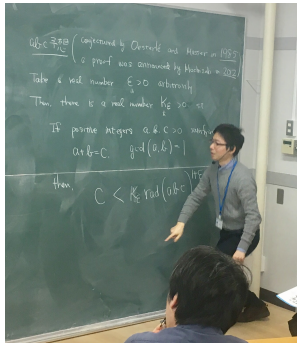
https://ithems.riken.jp/en/access

Kobe

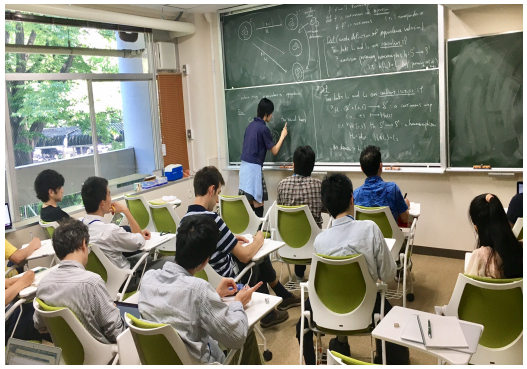
Kyoto

Sendai

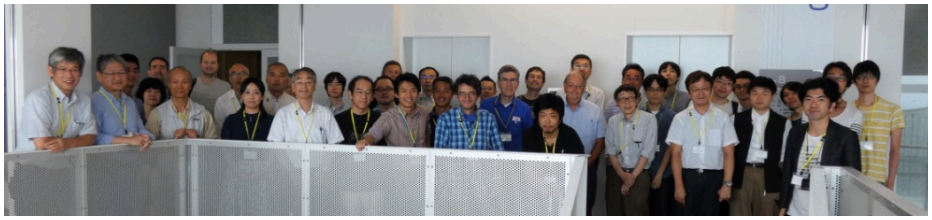
Berkeley



Special Lecture

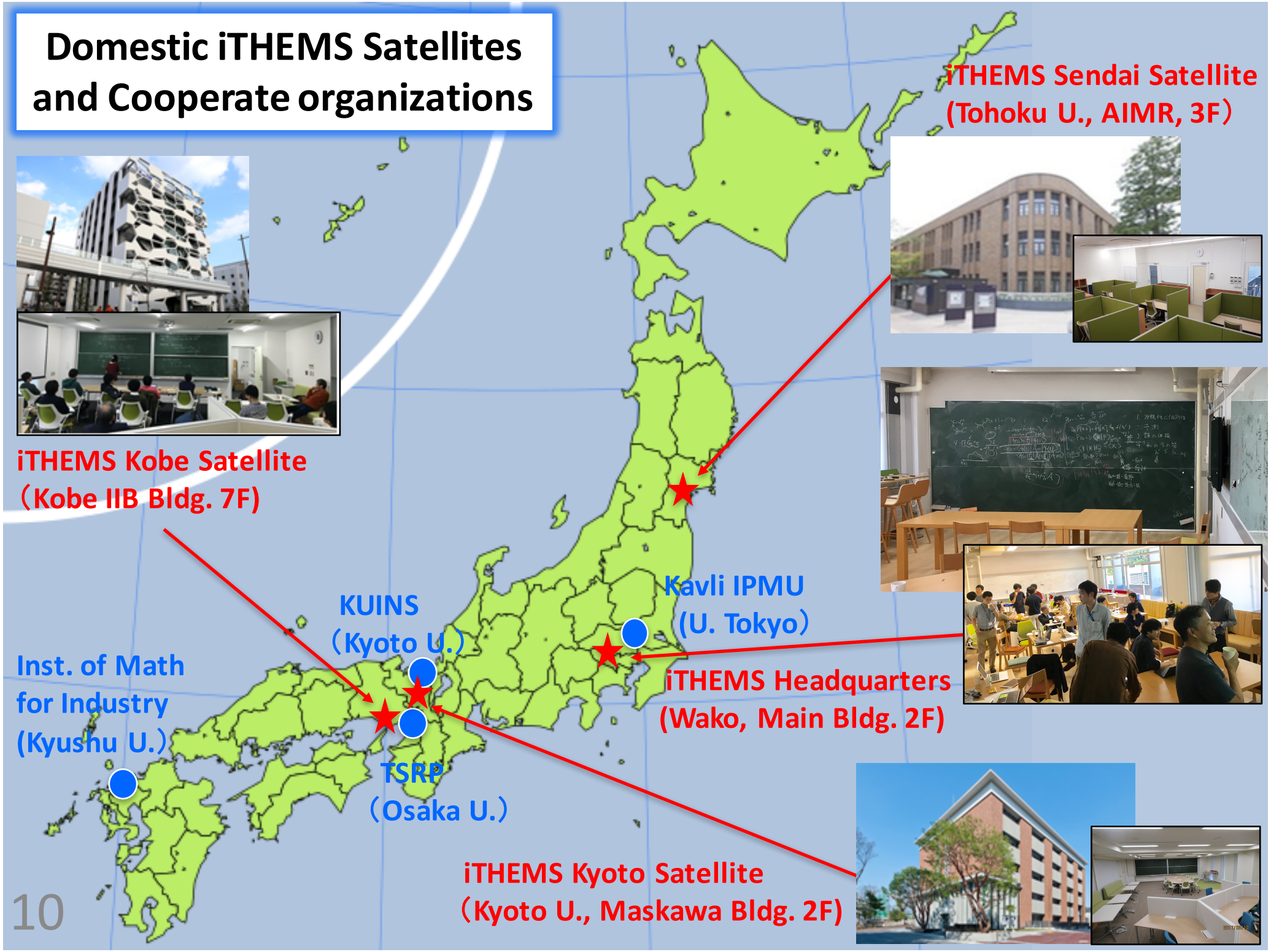


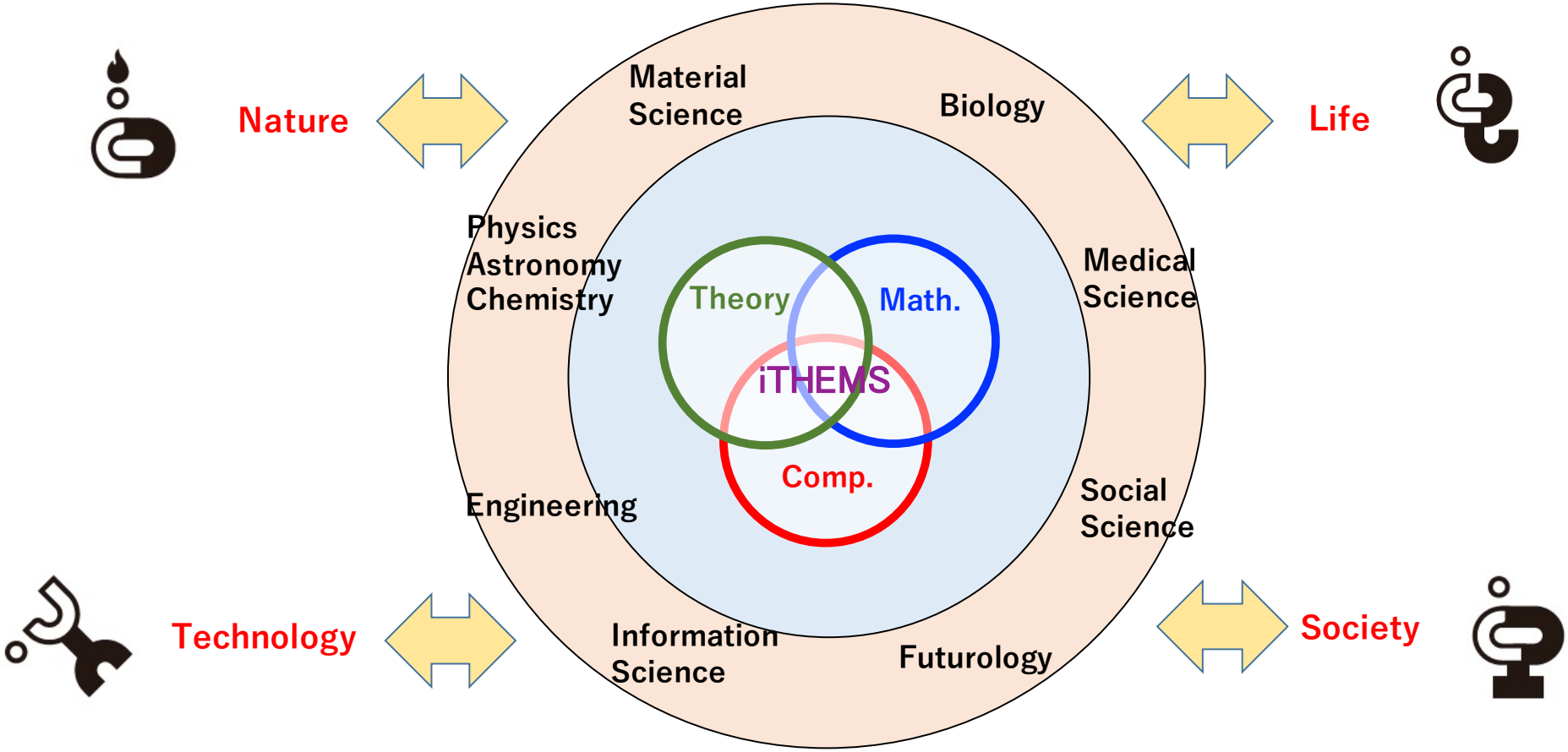
Lecture Series



International Workshop

Domestic iTHEMS Satellites and Cooperate organizations





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