Closing address

June 30, 2006
At Sendai International Center

Osamu Hashimoto

What is the 21st Century COE Program ?

Targeted Support for Creating World-level Research and Education Bases

Based on its June 2001 report, “A Policy for the Structural Reform of Universities”, the Ministry of Education, Culture, Sports, Technology and Science (MEXT) established a budget to launch in FY 2002 a new initiative called the 21st Century COE Program. Program works to cultivate a competitive academic environment among Japanese universities by giving targeted support to the creation of world-standard research and education bases (Centers of Excellence) in a range of disciplines.

By thus raising the standard of both education and research in them, the Program seeks to elevate Japanese universities to the world’s highest echelons, while fostering people of talent and creativity who will be qualified to assume roles as world leaders. In this way, the Program aims to promote the development of universities that are vigorous in the pursuit of their mandates and that are competitive at the highest levels of international excellence.

In carrying out this Program, JSPS has established the "21st Century COE Program Committee" to oversee grant selection and program implementation.

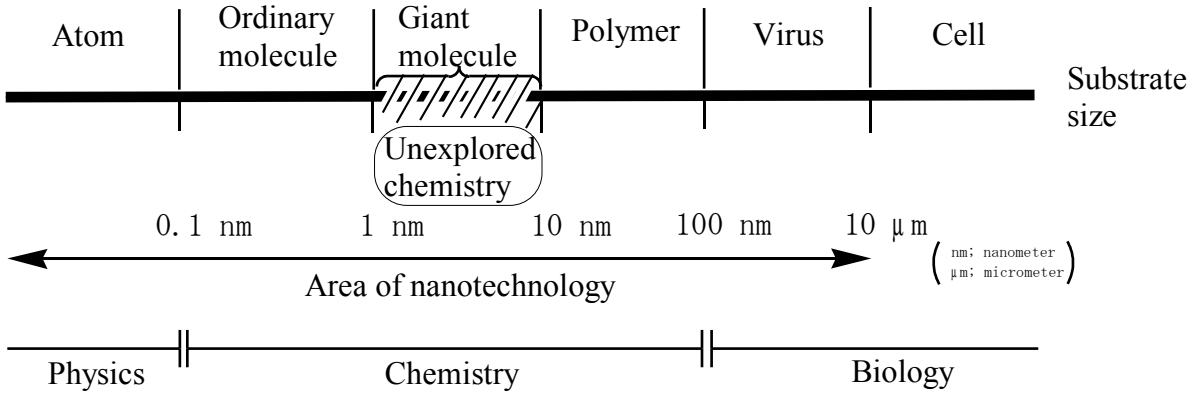
- **High level research activity is assumed**
- **Fostering young scientists is emphasized**

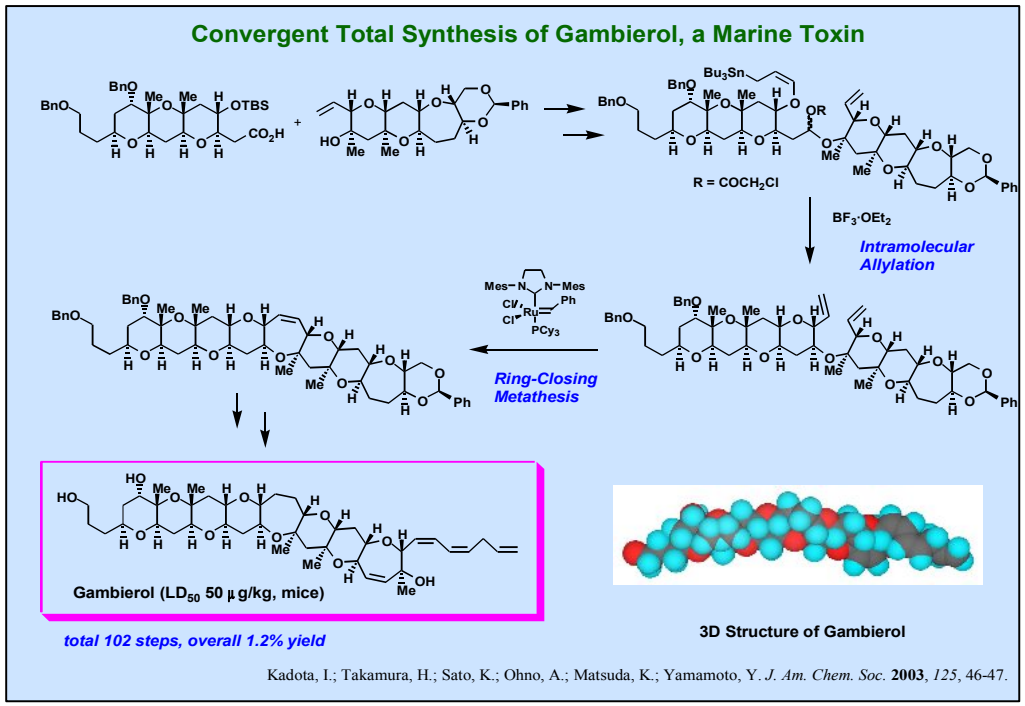
Three COEs of the school of science, Tohoku University

(1)	Giant Molecules and Complex Systems	Chemistry JFY2002-2006
(2)	Exploring New Science by Bridging Particle-Matter Hierarchy	Physics, Astrophysics and Mathematics JFY2003-2007
(3)	Advanced Science and Technology for the Dynamic Earth	Geophysics and Earth Science JFY2003-2007

(1) Giant Molecules and Complex Systems

Relation between reasearch field and substrate size



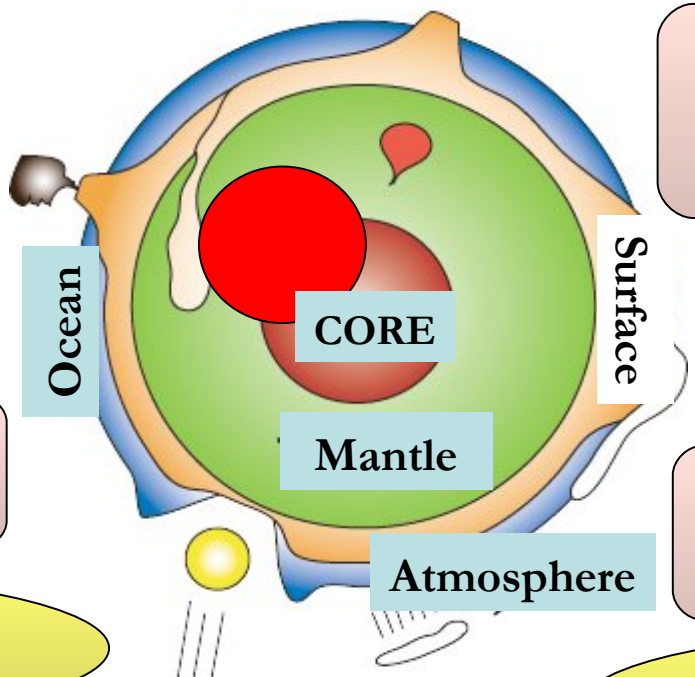


(2) Advanced Science and Technology Center for the Dynamic Earth

Core mantle dynamics

Solid Earth Research Group

Dynamics of Earthquakes and volcanoes



Dynamics of Ocean, Atmosphere, Magnetosphere, and Space Research Group

Dynamics of Climate change

Earth system evolution Research Group

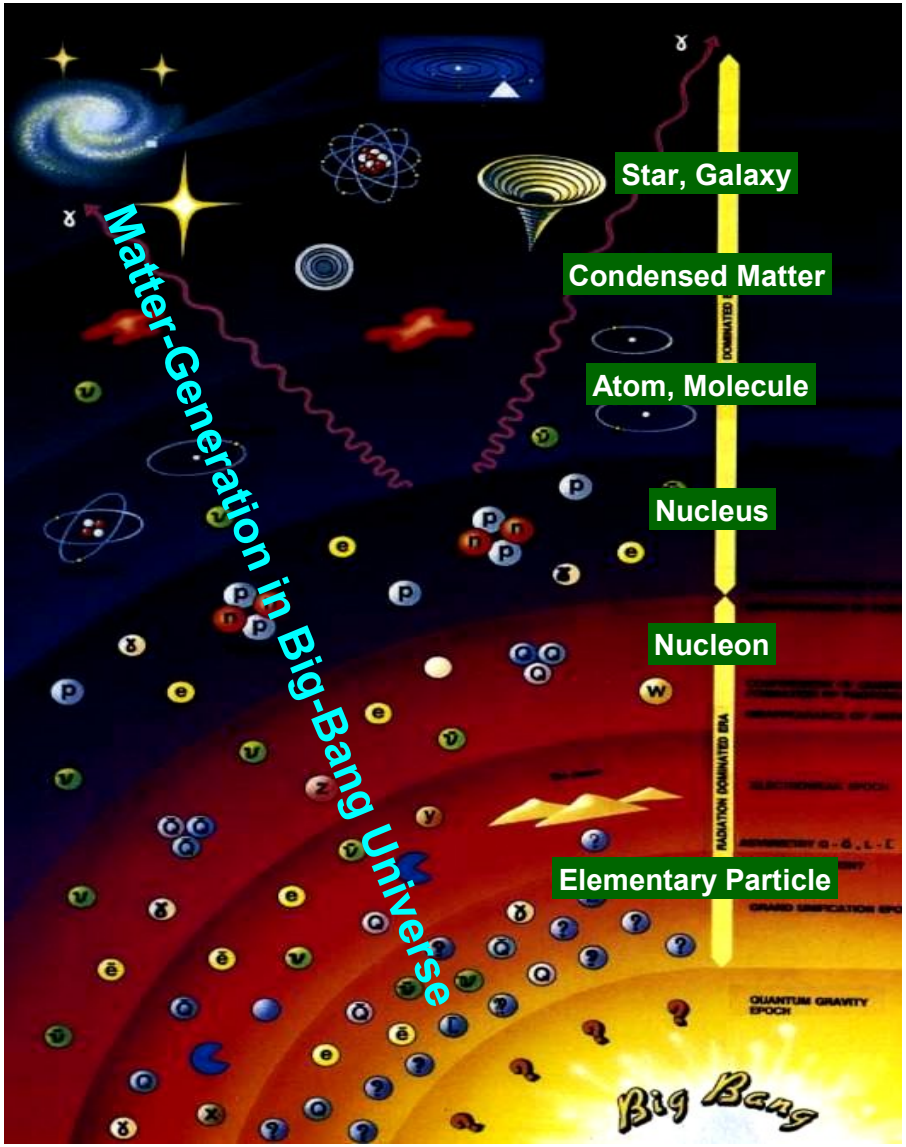
Long term climate evolution Research Group

Dynamics of the Earth system evolution

Dynamics of Solar-terrestrial interaction

Theory of the Dynamic Earth

(3) Exploring New Science by Bridging Particle-Matter Hierarchy



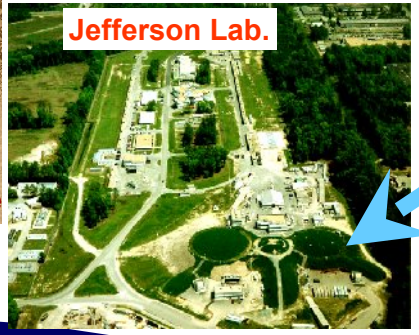
Current Activities

1000 ton Liquid Scintillator Underground Neutrino Detector

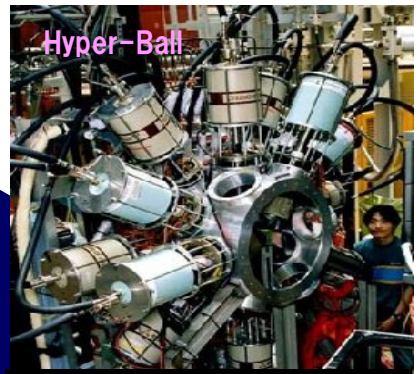
Tohoku-US-China Collaboration

Kamioka Mine

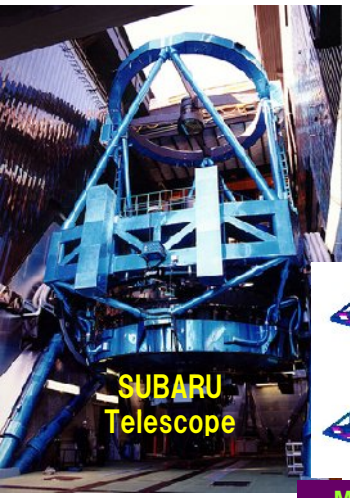
Tohoku-US Collaboration

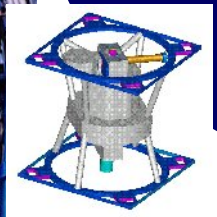


High Precision Hypernuclear Spectroscopy



KEK &
Brook-Heaven National Lab.





Multi-Object Infrared Camera & Spectrograph (8 Million pixel Hg-Cd-Te)

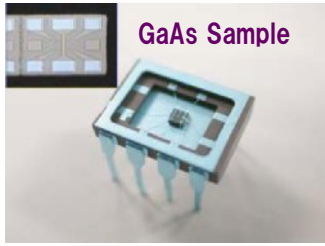
Photon-Factory (SPring-8)

Theory Group

Strongly Correlated Electrons and Nanostructures
Statistical Theory of Soft Materials

Supersymmetry and Higgs Sector
Strings, Extra-Dimensions and Early Universe

Nonlinear Analysis
Navier-Stokes Equation



Macro-Coherence in 2-Layer Quantum Hall State

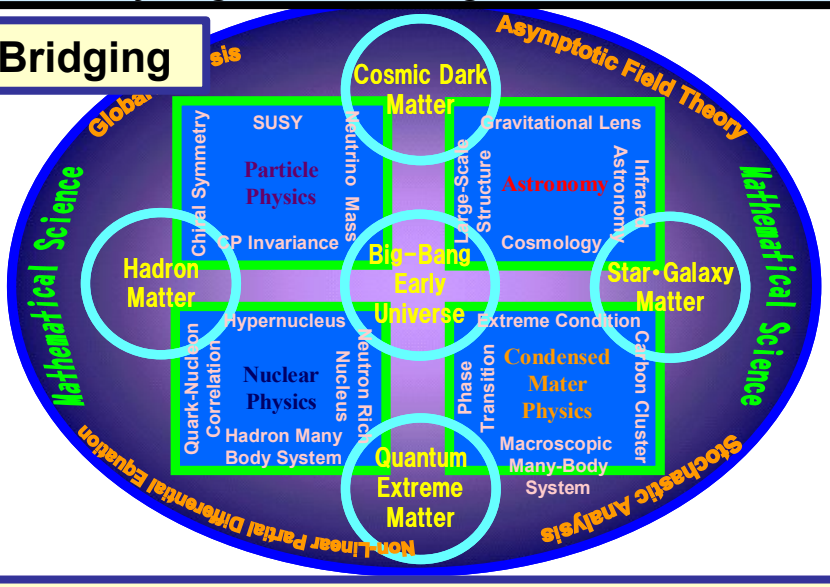
Exploring New Science by Bridging Particle–Matter Hierarchy

School of Science, Tohoku University

Goal

- Explore a new science of quark-hadron matter, quantum extreme matter, Star/galaxy matter, Cosmic dark matter /energy etc. which were generated crossing the particle, nuclear, condensed matter and astronomical hierarchies
- Promote interdisciplinary collaboration among physics, astrophysics and mathematics and intend to establish new science bridging particle-matter hierarchy
- Extend bi-directional international and domestic collaboration in wide variety of discipline based on high activity
- Foster young scientists and graduate school students under competitive and international atmosphere

Bridging



An example of research activity

Kamland, built underground neutrino detector at Kamioka mine, observed neutrino oscillation and, for the first time, geo-neutrino spectrum

Support for Graduate students, young scientists

- Special research budget for Doctor students and postdocs （over 70 awards per year ）
- International bi-directional cooperation （ sending abroad 82, inviting from abroad 73（'03–'05）
)
- Special lectures and seminars by visiting professors
- COE symposium by young scientists

Institutions for bidirectional Co-education

LBL, UC Berkeley, Caltech, Stanford U.,Ilinnois U.,JLab, Houston U., Alabama U. Hawaii U., Tennessee U.,SUNY, Yubaskira(Finland), Zagreb(Croathia), MIT, Lyon U,Oslo U., Tsinhua U., Lanzhou U., Atomic Energy Institute,(Beijing), High energy Institute(Beijin), Indian Scinence Institute, etc. etc.

Comments by the COE review committee

Very highly rated

- It is encouraged to deepen mutual understanding and further stimulate collaboration among different hierarchies.
  - Example
    - Condensed matter physics – nuclear physics
    - Mathematics – elementary particle physics
    - ……
- It is important to educate students through domestic and/or international collaboration not only in the same field but also among the neighboring research fields.

Bridging and/or Fusing ⇒ Post-21COE proposal

JFY2008 -

This COE symposium is a good stepping stone

Thanks

- To all the speakers,
  particularly those from outside Tohoku University

- To all the participants

- To the organizing committee members
  Y. Sumino (Chair), Y. Fujii, K. Hagino, A. Koreeda,
  H. Kusunose, T. Mitsui, H. Nakao, T. Sato,
  N. Uchida, M. Nakamura, M. Takada