

Japan-Taiwan Joint Workshop



NIMS OVERVIEW & Technology Transfer

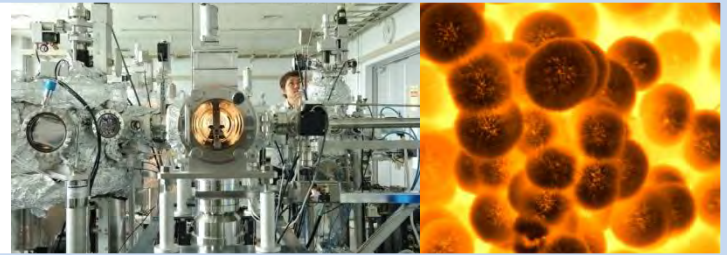


March 10th, 2015



National Institute for Materials Science (NIMS)

National Institute for Materials Science(NIMS)



1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010

1956~

**National Research
Institute for Metals**

2001~

NIMS

1966~

**National Institute for Research in
Inorganic Materials**



National Institute for Materials Science

Established in April 2001

– World's Core Institute in Materials Research –

Four Missions

1. Fundamental scientific and engineering research
2. Utilization of research results for society
3. Shared use of advanced facilities and equipment
4. Training of researchers and engineers

Three Sites of NIMS



Sengen



Sakura



Namiki

Location of NIMS

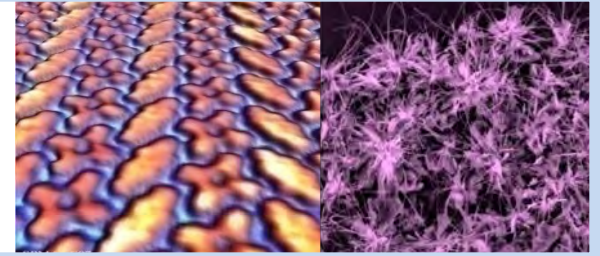


New Building will be opened at Sengen site (*April 2015*)

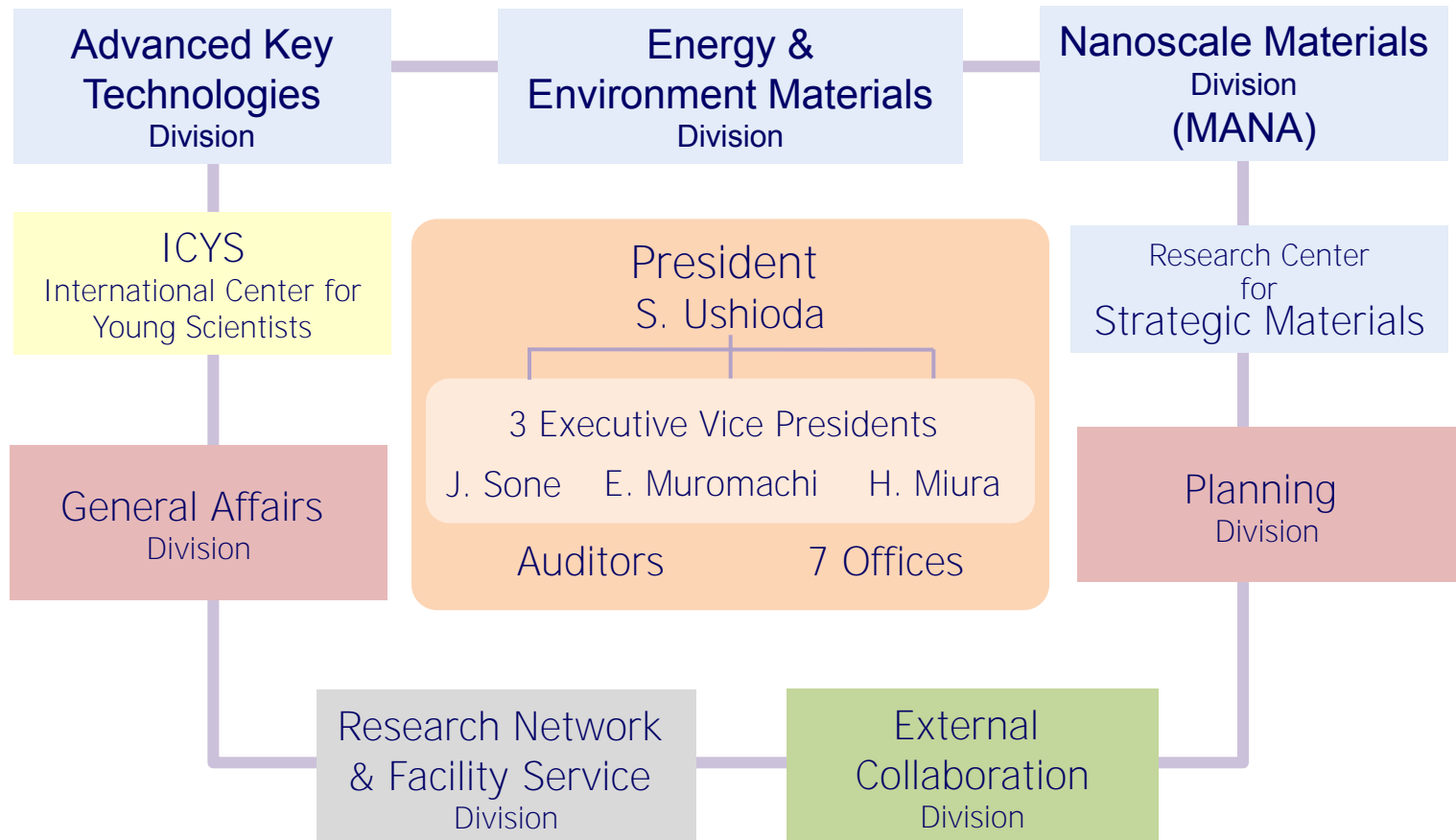


NanoGREEN/WPI Building at Namiki site (*April 2012*)

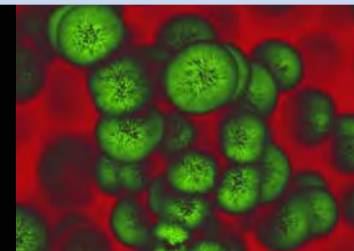
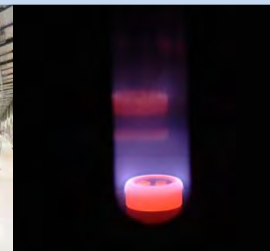
NIMS Organization Chart



As of April 1, 2013



Number of Staffs



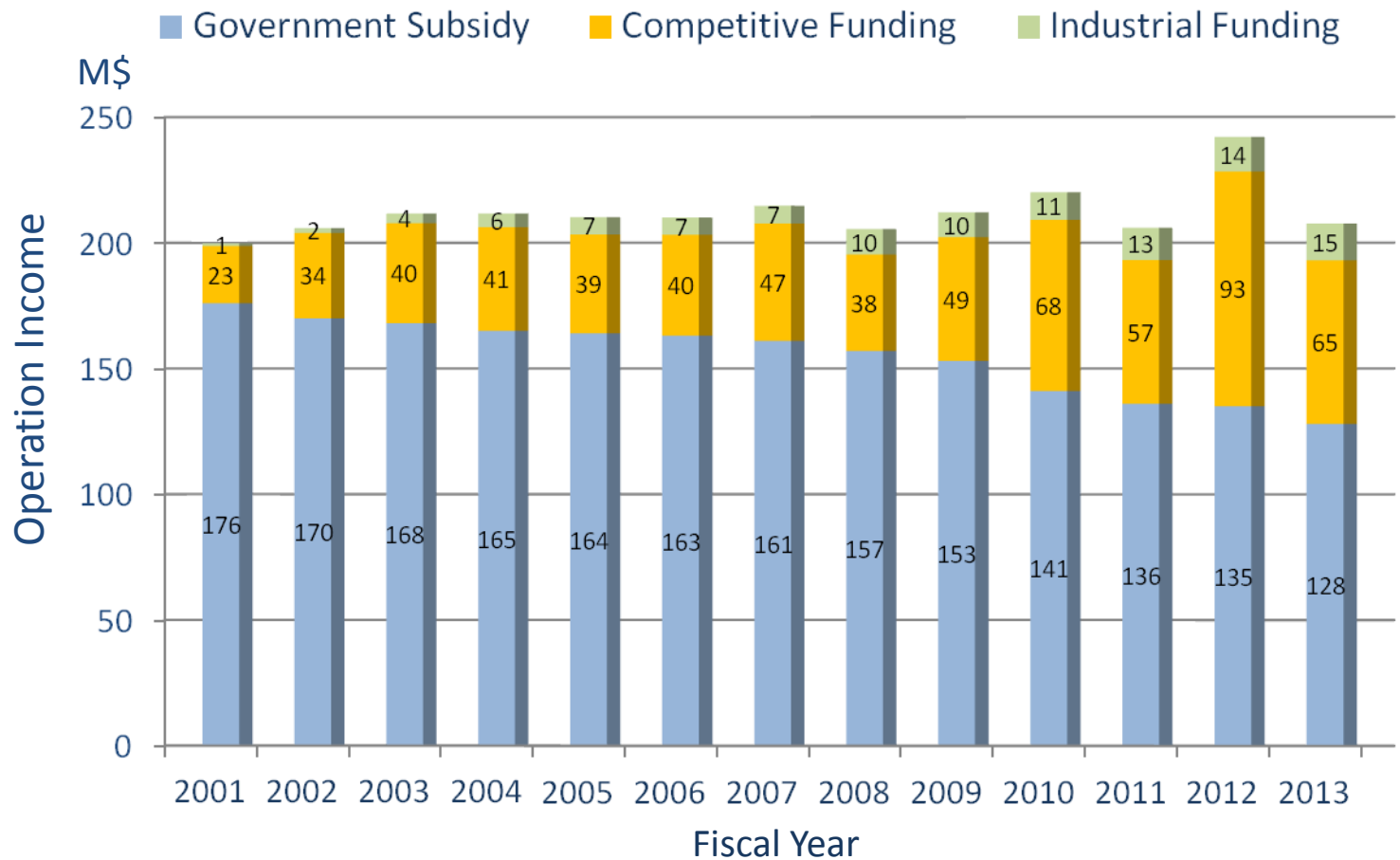
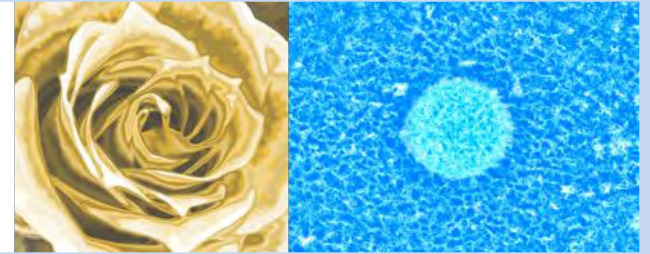
April 1, 2013

Classification	Number
Executives	6
Research Groups	1,146
Tenure Researchers	396
Invited Researchers	16
Special Researchers	57
Postdoctoral Researchers	241
Junior Researchers	100
Engineers	63
Technicians	273
Non- Research Groups	365
Administrative Staff	328
Specialized Professions	37
Total	1,495

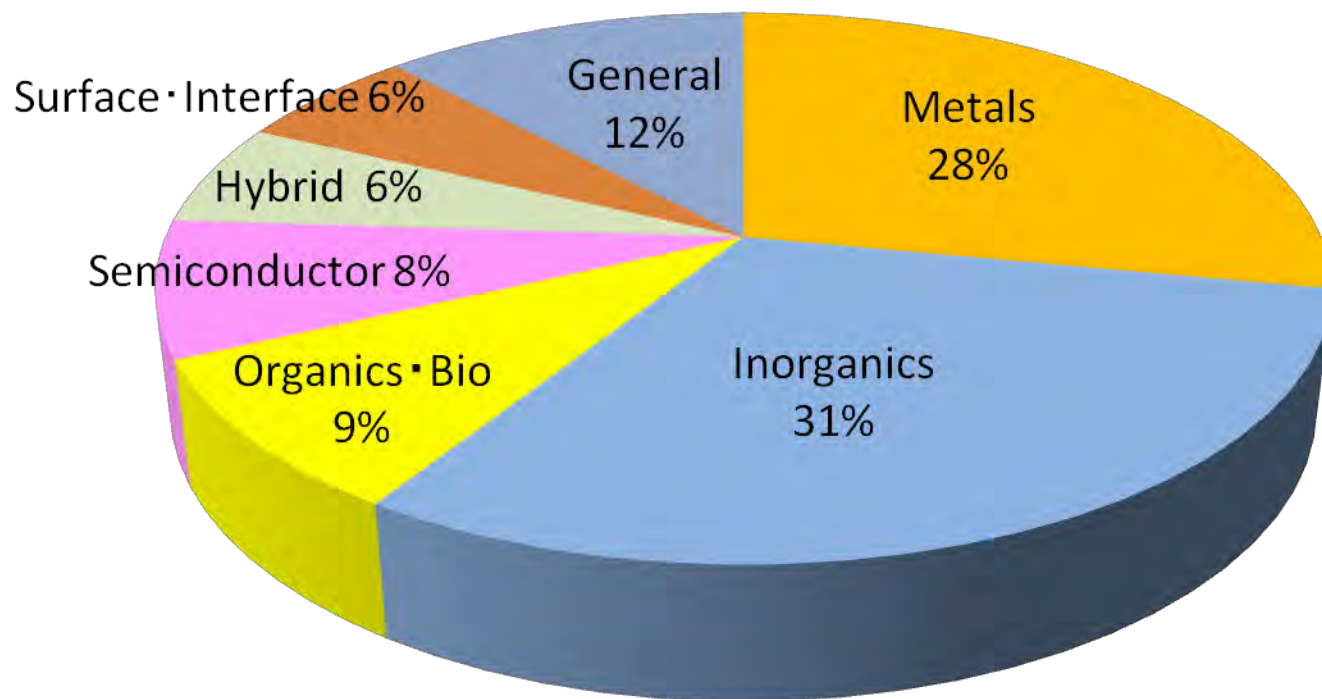
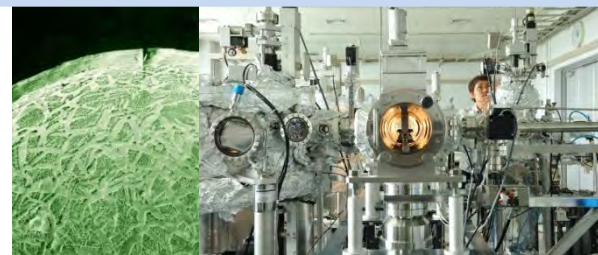
40%

Country	Number	Country	Number
Australia	2	Netherlands	1
Algeria	1	Nepal	3(1)
Bangladesh	2(1)	Pakistan	2
Belgium	1	Philippines	1
Canada	3(2)	Poland	2
China	161(16)	Romania	1
Czech	1	Russia	9(3)
Egypt	7(1)	Singapore	1
Fiji	1	Spain	5(2)
France	4	Sri Lanka	1
Germany	3	Switzerland	2(1)
Hungary	1	Taiwan	3
India	43(2)	Thailand	3
Indonesia	4	UK	7(2)
Iran	6	Ukraine	3(1)
Italy	3(1)	USA	2(1)
Korea	22(3)	Vietnam	5
Malaysia	1	Zimbabwe	1
Moldova	1	Total	319(37)

Operation Income Trend



Researchers Classification by Materials



General*: Computational Science, Analytical Science, Characterization, etc.

NIMS Research Field Outline



Seeking Solution for Important Global Problems:
Energy, Environment and Resources Technologies

Research and Development for Advancement of Materials
to Meet Social Needs

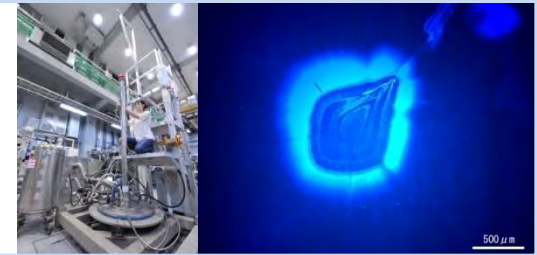
Advanced Key Technologies

Nano-Scale Technologies

Promoting Advanced Cross-Cutting Research and Development

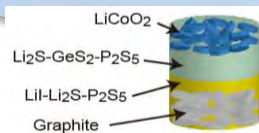
World Top Class Facilities and Equipment
Research Network and Facility Services

NIMS Research Portfolio & Main Research Themes



Energy and Environment Technologies

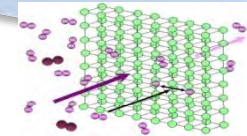
Solid-state Lithium Batteries



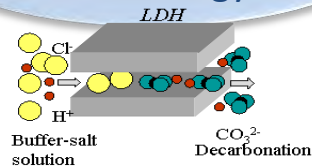
Photovoltaics Technology



Hydrogen Production Technology



Environmental Remediation Technology



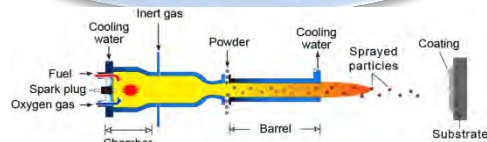
Superconductive Technology



High Power Magnetic Technology



Coating Technology



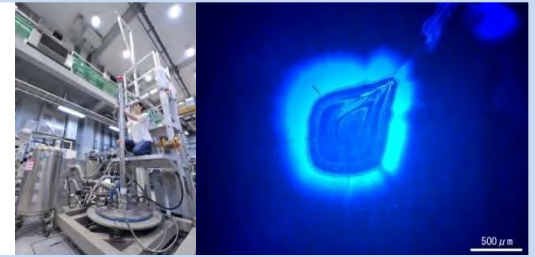
Reliability & Safety Technology



Heat Resistance Technology



NIMS Research Portfolio & Main Research Themes



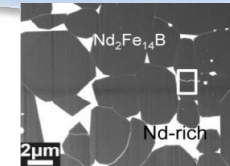
Natural Resources Technologies

High performance technology without rare earth/rare metals is aimed not only for functional materials of magnet and catalyst but also for structural materials of vehicles and bridges.

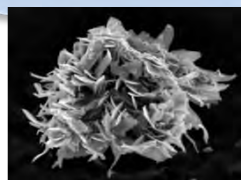
RE-free Wrought Mg Alloy



Dy-free Ne-Fe-B Magnet



Long-life Exhaust Catalysts for Vehicles



Structural Materials

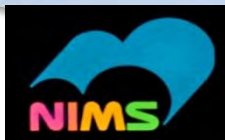


NIMS Research Portfolio & Main Research Themes



Advanced Key Technologies

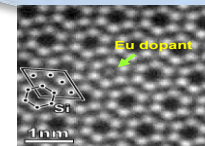
Photonic
Materials
Technology



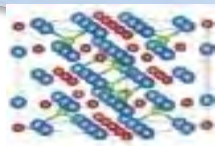
Computational
Materials Science



Surface
Physics and
Structure



Advanced
Characterization
Technology



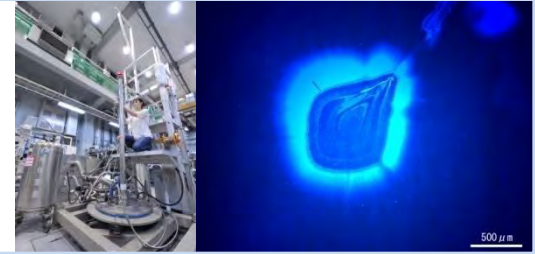
Organic Material
Synthesis
Technology



Advanced
Quantum
Beam
Technology



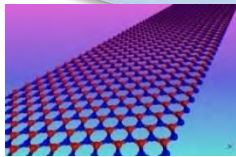
NIMS Research Portfolio & Main Research Themes



Nano Scale Technologies (MANA)



Nano-Materials Technology



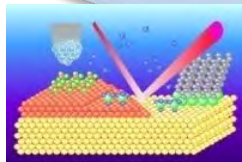
- Soft Chemistry
- Nanotubes
- Nano-Electronics
- Supramolecules
- Inorganic Nanostructures

Nano-System Technology



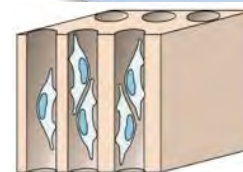
- Atomic Electronics
- Nano Functionality Integration
- Theoretical Physics
- π -Electron Electronics

Nano-Power Technology



- Nano Interface
- Nano Photocatalyst
- Soft Ionics
- Reticular Materials

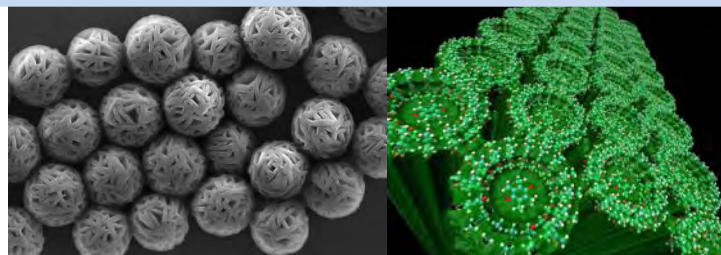
Nano-Life Technology



- Biomaterials
- Tissue Regeneration Materials

* : International Center for Materials Nanoarchitectonics

Advanced Facilities and Equipment



World Class Facilities & Equipment



>1GHz
High Resolution
Solid-States
NMR Magnet



35T Hybrid
Magnet



Ultra High
Resolution TEM

Dual Ion Beam
Interfaced High-
Voltage TEM

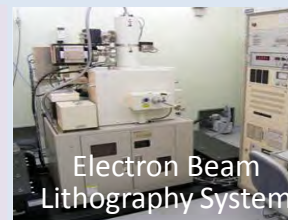


A Large
Synchrotron
Radiation
Facility

2-D Nano-Patterning Foundry & 3-D Nano-Integration Foundry



Clean Room



Electron Beam
Lithography System



Focused Ion Beam
System

Bio-Organic Materials Facility

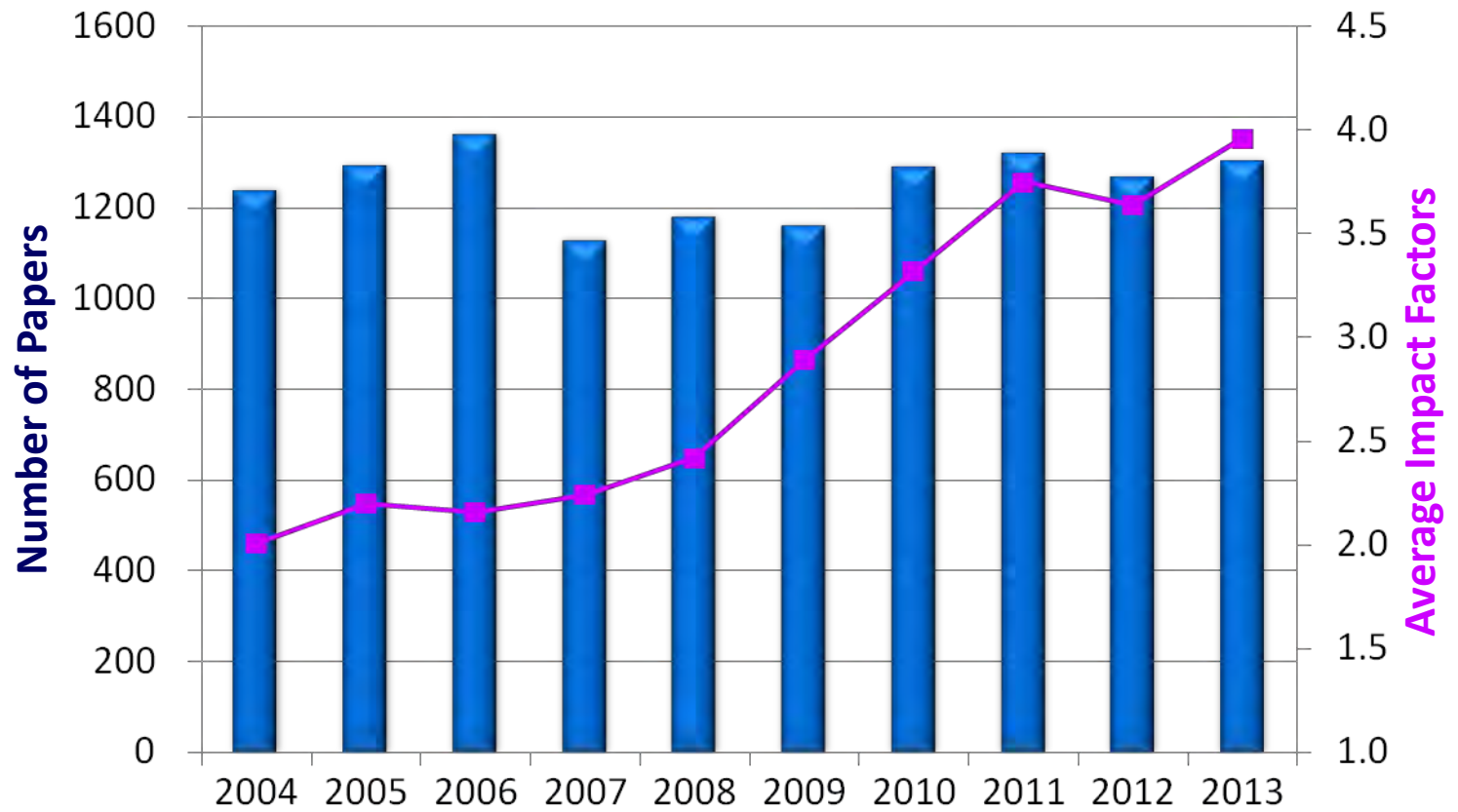


Polymer and Organic
Materials Lab.



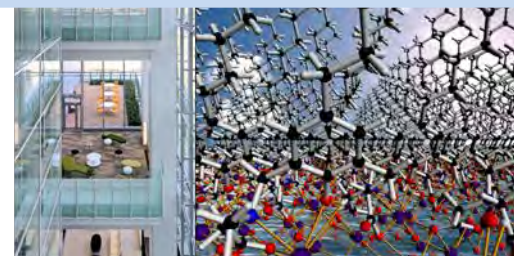
NIMS-Leica
Bio Imaging Lab.

Status of Publications



Note: Analysis based on the Web of Science database provided by Thomson Reuter

Citation Ranking (Materials Science)



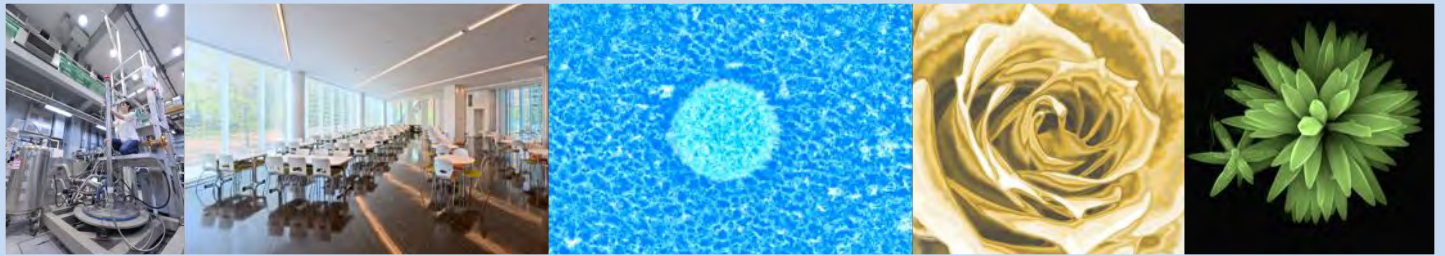
Before NIMS was established

Jan. 1996 - Dec. 2000		
Rank	Institution	Citations
1	Max Planck Society	4,886
2	Tohoku University	3,990
3	UC Santa Barbara	3,204
4	MIT	3,095
5	Russia Acad. Sci.	3,026
6	Univ. Cambridge	2,570
7	AIST	2,561
8	Penn State Univ.	2,517
9	Kyoto University	2,443
10	Osaka University	2,370
...
31	NIMS(NRIM+NIRIM)	1,570

After NIMS was established

Jan. 2002 – Dec. 2012		
Rank	Institution	Citations
1	Chinese Acad. Sci.	174,741
2	Max Planck Society	76,037
3	MIT	52,187
4	NIMS	51,678
5	Natl. Univ. Singapore	50,730
6	Tohoku University	50,635
7	Tsing Hua Univ.	48,497
8	Univ. Calif Berkeley	43,825
9	AIST	43,576
10	Georgia Inst Technol	41,195

*Compiled from the ESI database,
Thomson Reuter, as of April, 2013*



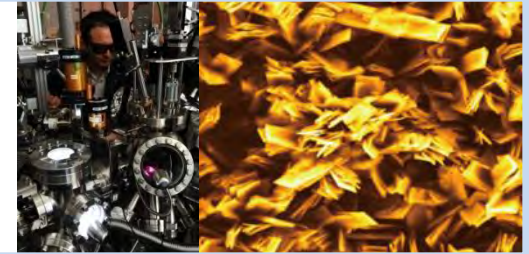
External Collaboration Division

- Academic Collaboration
- Industrial Collaboration
and Technology Transfer
- Intellectual Property and Licensing

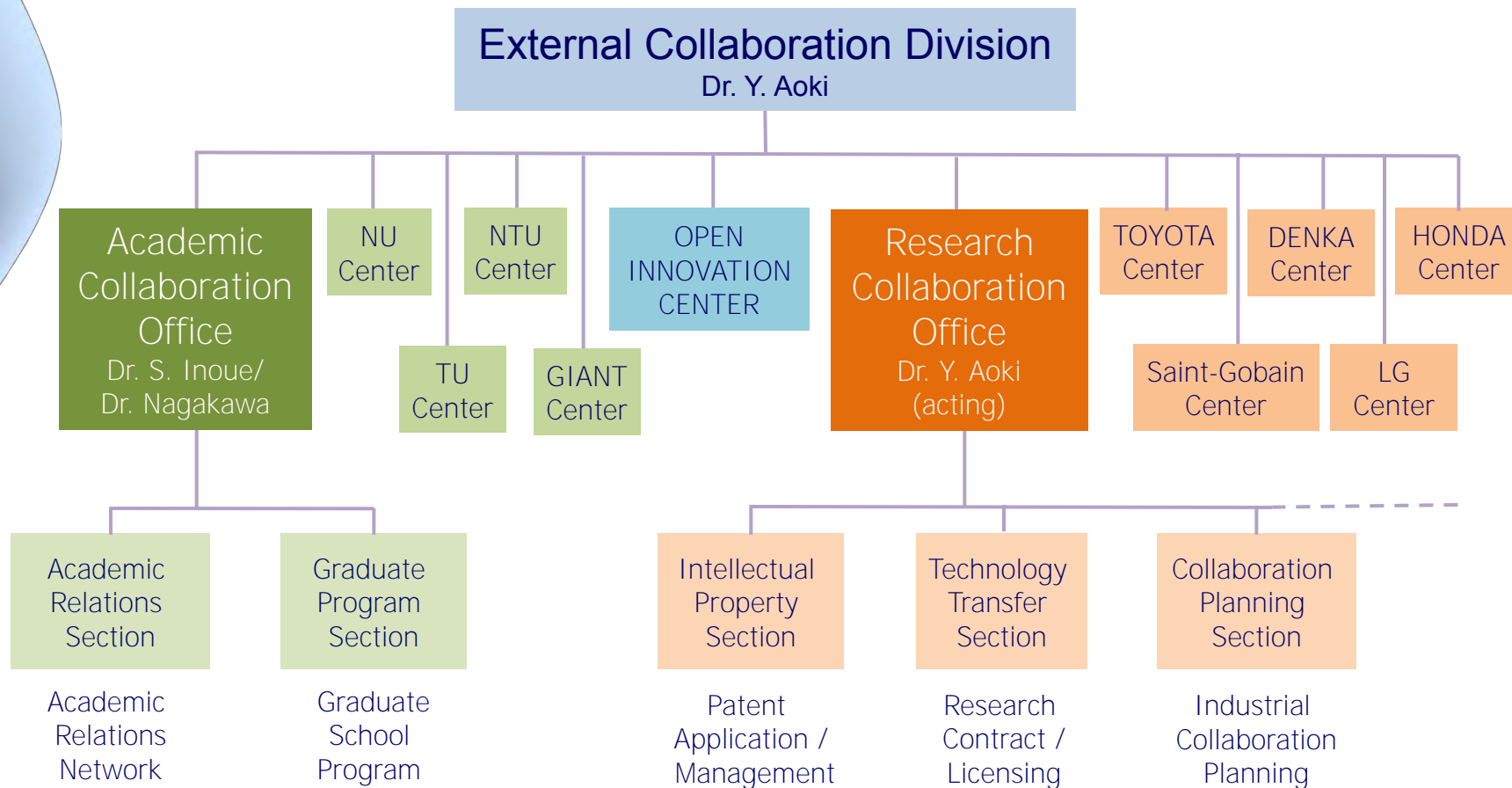
National Institute for Materials Science (NIMS)

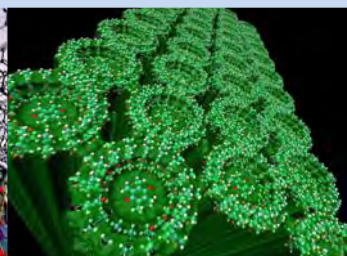
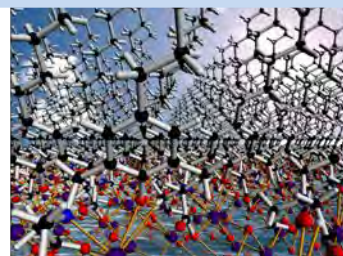
Organization Chart

External Collaboration Division



As of October 1, 2014



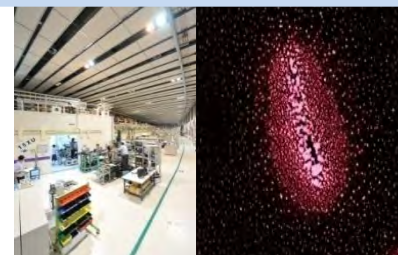


Academic Collaboration & Education

- Research Collaboration Partnership
- Graduate School Program Partnership

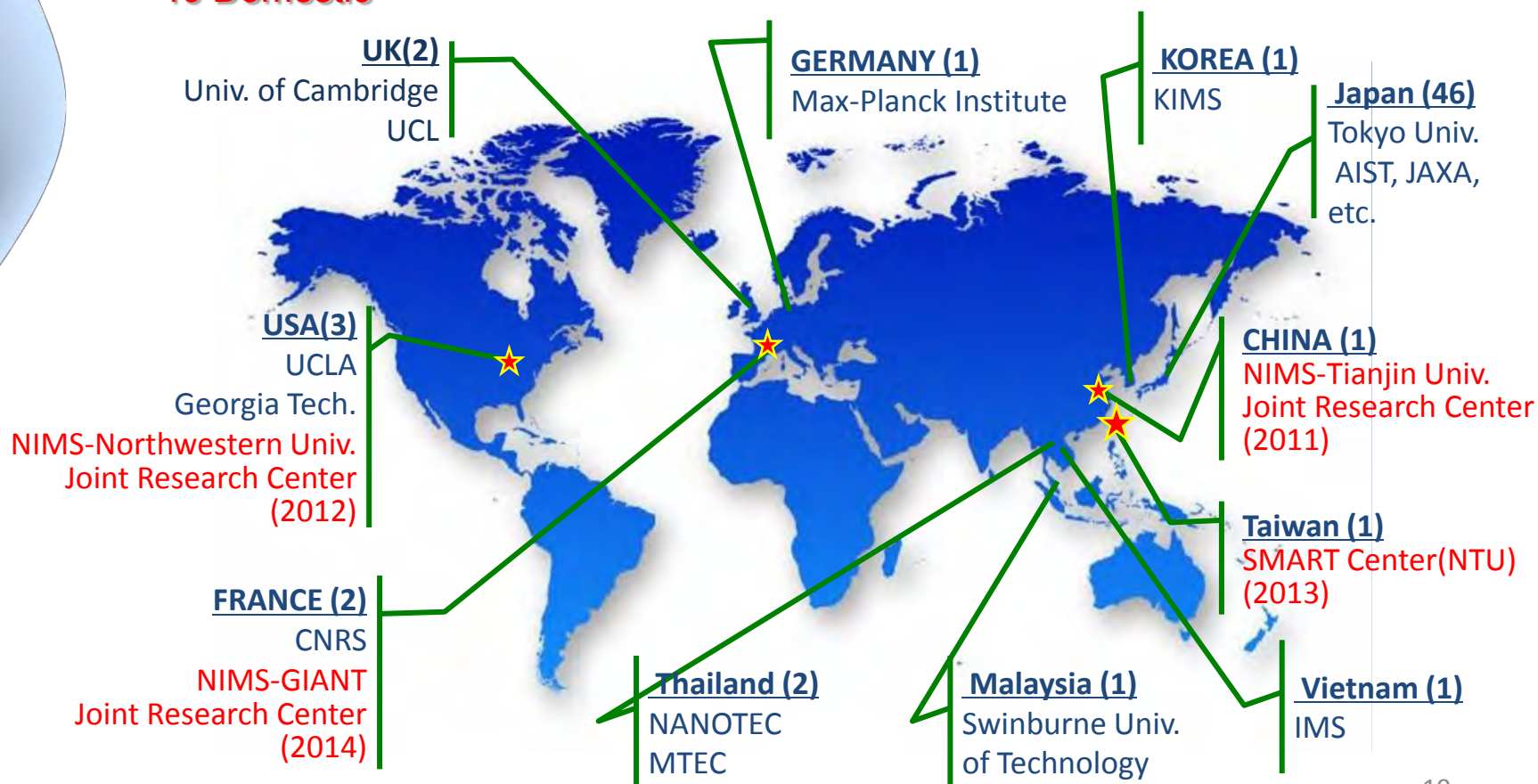
National Institute for Materials Science (NIMS)

Academic Research Partners (Research Collaboration)

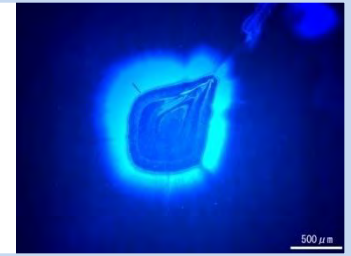


15 Overseas (★: 4 Joint Research Centers)
46 Domestic

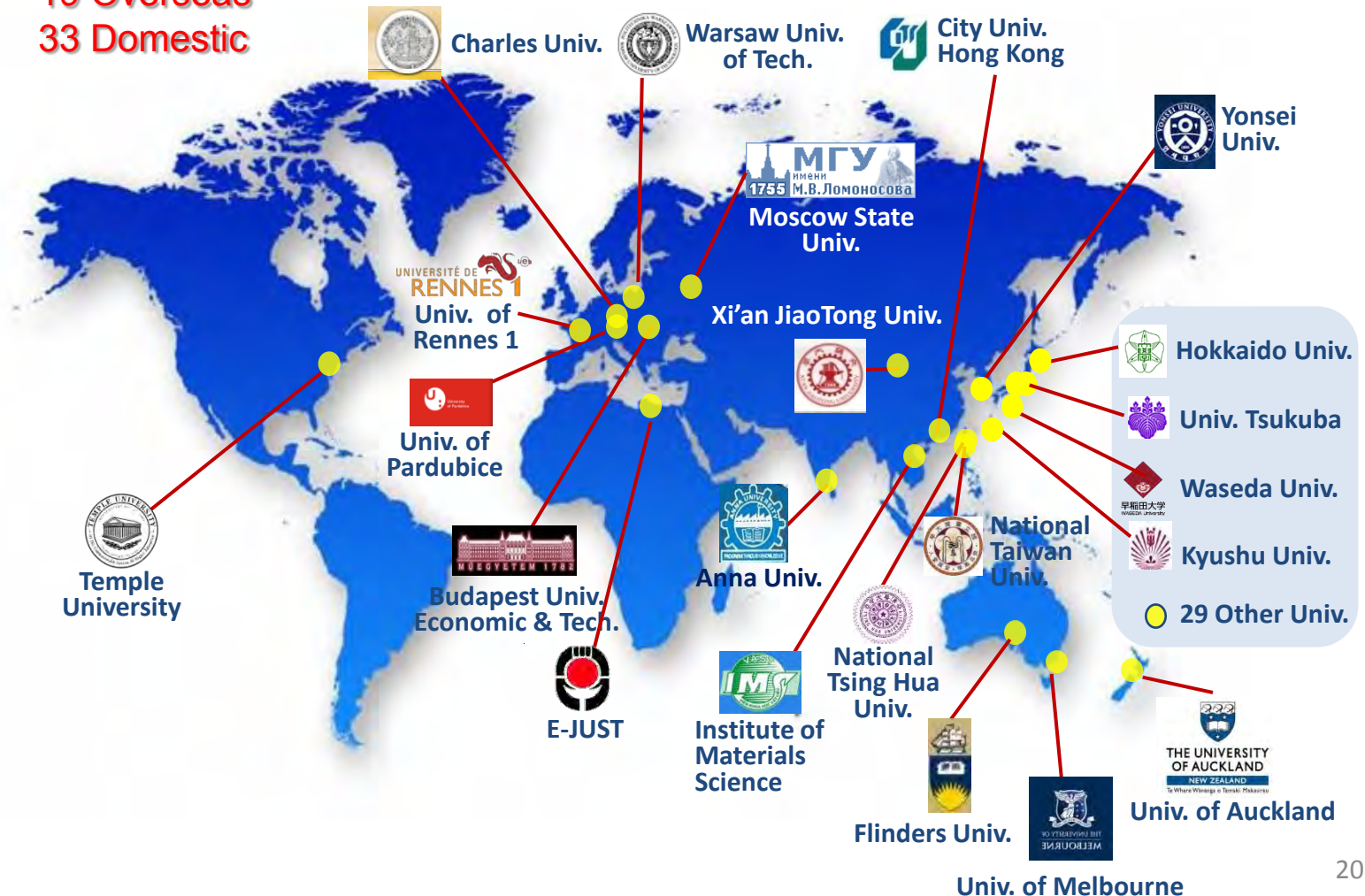
as of October 1, 2013

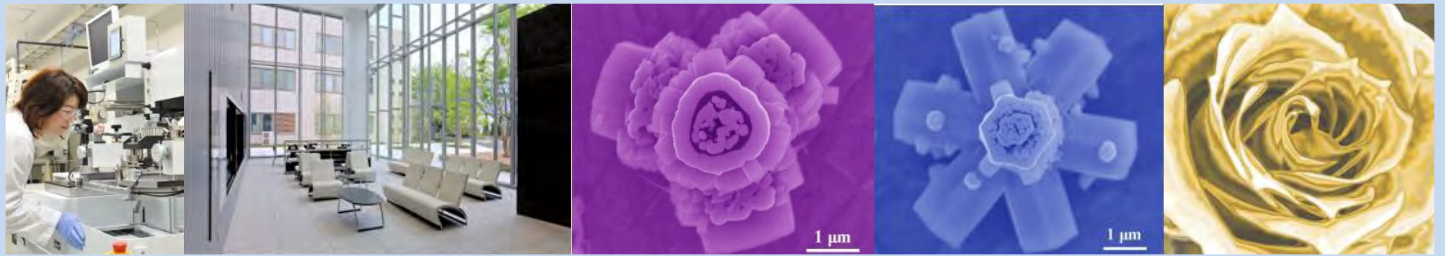


Academic Education Partners (NIMS Graduate School Program)



19 Overseas
33 Domestic

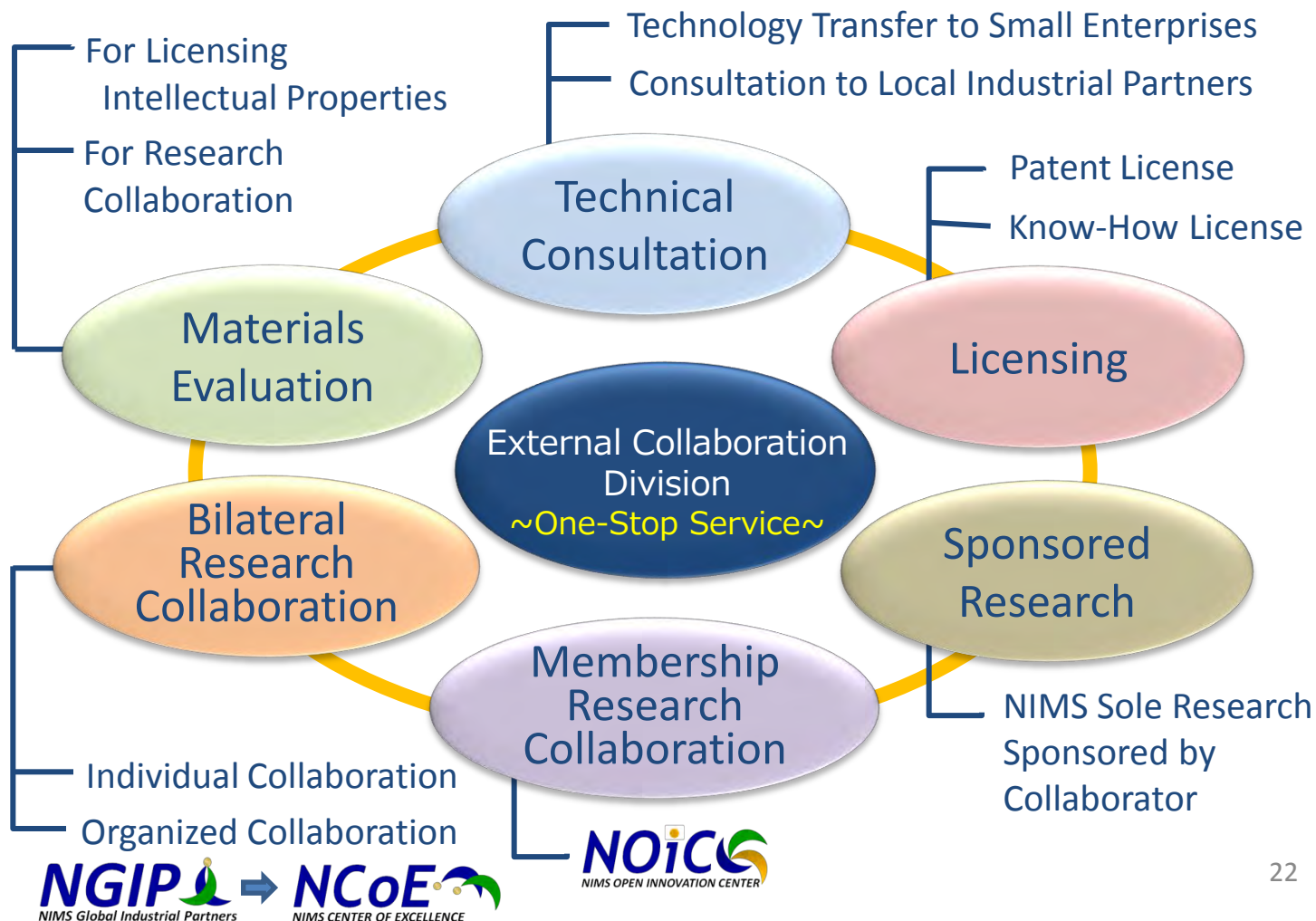
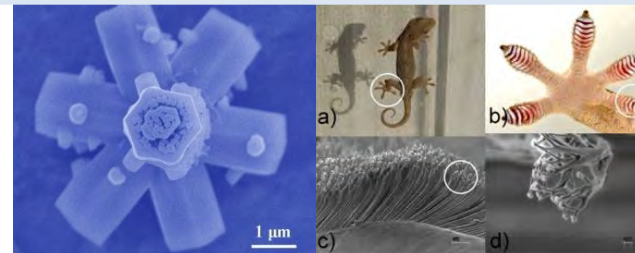




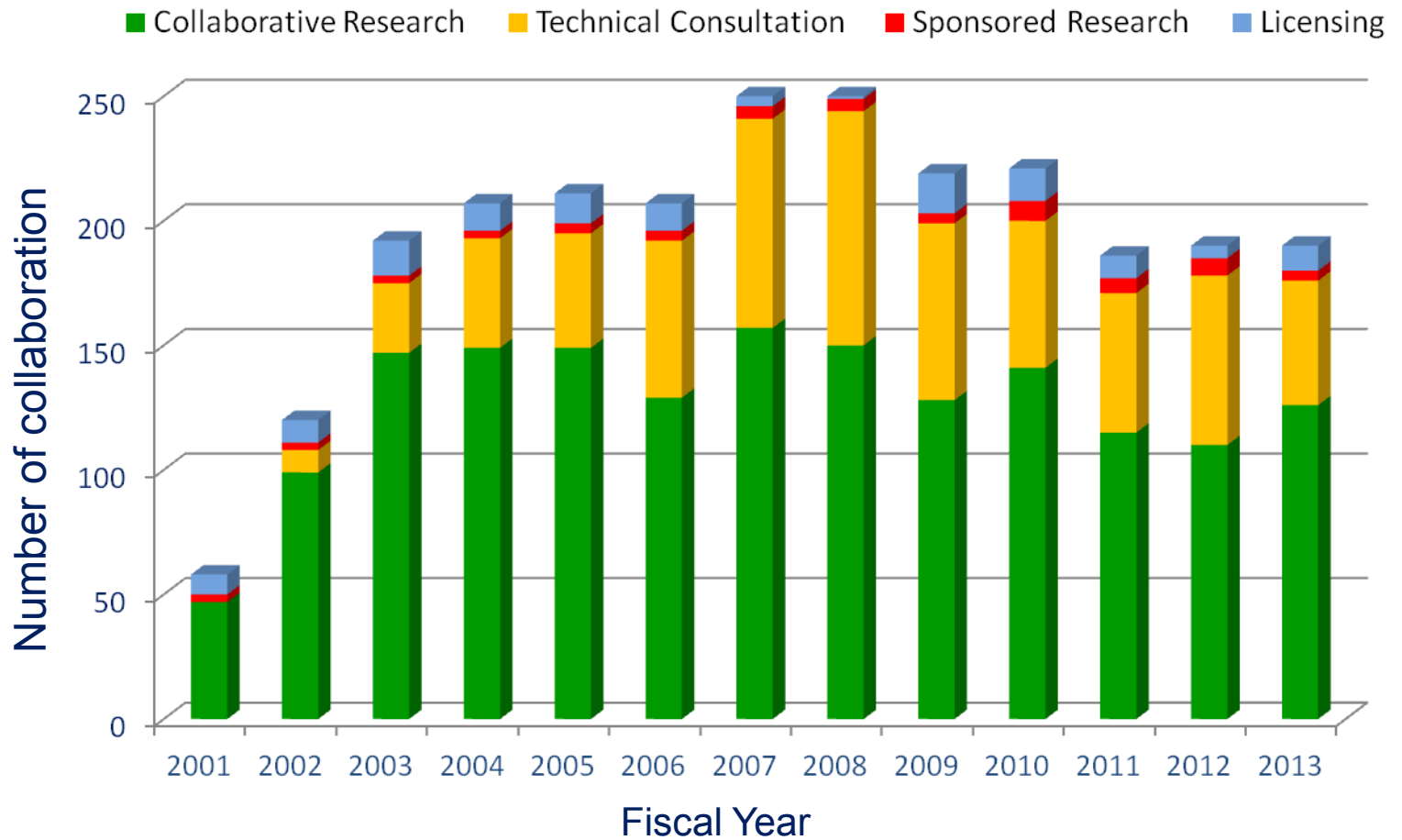
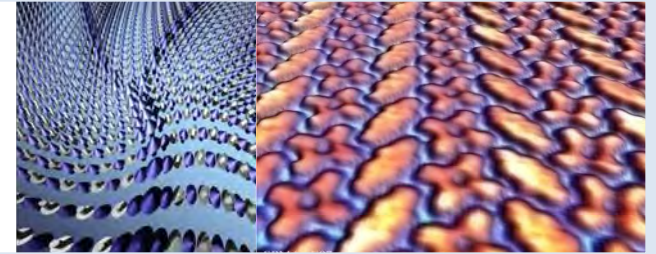
Industrial Collaboration and Technology Transfer

National Institute for Materials Science (NIMS)

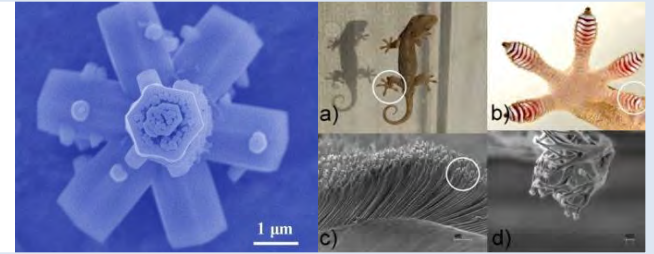
Variety of Technology Transfer Schemes



Collaboration with Industrial Partners



Abenomics Growth Strategy



Government's New Vision and Policy
for
IP and Collaboration Strategy among
Industry, Government and Academia
as of June 7, 2013

**“Government will fully Enforce the Strategy of Collaboration
and Technology Transfer from Japanese Academia
with/to Advanced Global Enterprises”**

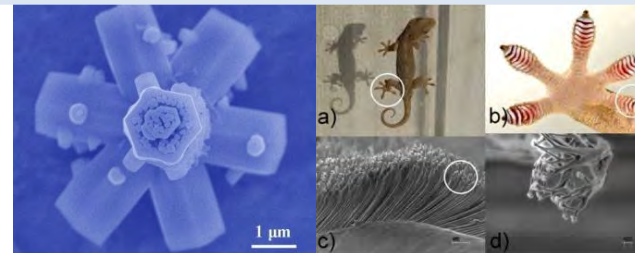
Clear Instructions to Two Ministry Offices:

- Ministry of Economy, Trade and Industry: METI
- Ministry of Education, Culture, Sports, Science and Technology: MEXT



***NIMS Open Innovation Policy is now
Fully Endorsed by Japanese Government***

Types of Collaboration



- Differentiate technologies from others
- New research subjects in well established business fields

Bilateral Collaboration



NIMS Center of Excellence

- Mid to long term research subjects in accordance with the business strategy of Collaborator and NIMS
- Reviewed and conducted by the top management of Collaborator and NIMS
- 6 NCoE have been established

- High risk research subjects by single company
- Launch out into a new technological field

Membership Collaboration



NIMS Open Innovation Center

- Common themes proposed by NIMS & Industrial Members
 - 1) Materials for Battery , 2) Materials for Thermal Energy Conversion, 3) Magnetic Materials
- Seek a new technology through collaboration at an open platform
- 12 industrial members, 4 academia members, and 36 NIMS researchers

NIMS Global Industrial Partners (including NCoE)



Membership Collaboration (NIMS Open Innovation Center)



Industrial Members (12)

As of April 1, 2014

HITACHI
Inspire the Next

**SHOWA
DENKO**

Empowered by Innovation

NEC



JX Nippon Mining & Metals

DENSO

DENKA



TAIYO YUDEN

Ars



**MITSUBISHI
CHEMICAL**



LG

Academia Members (4)

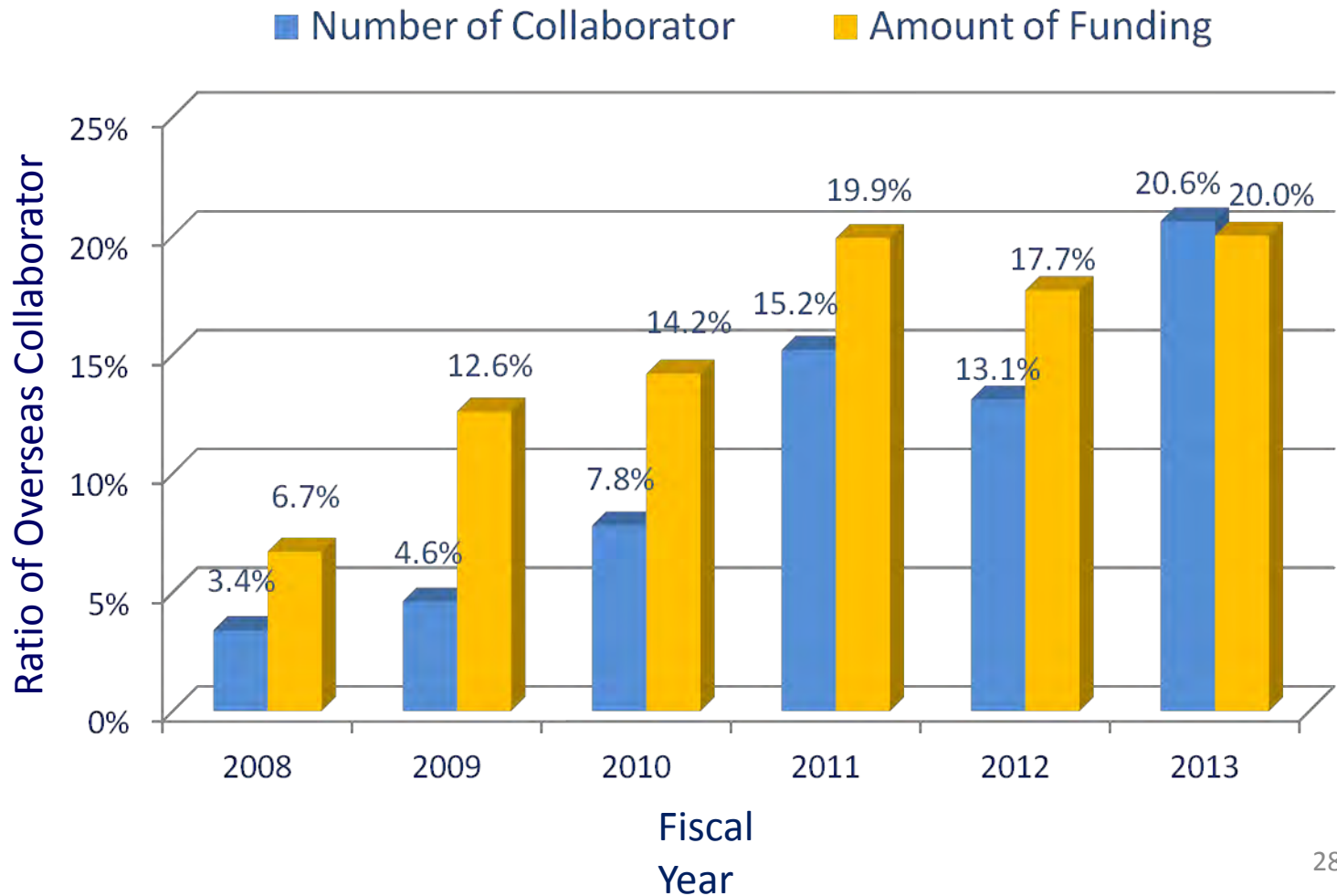
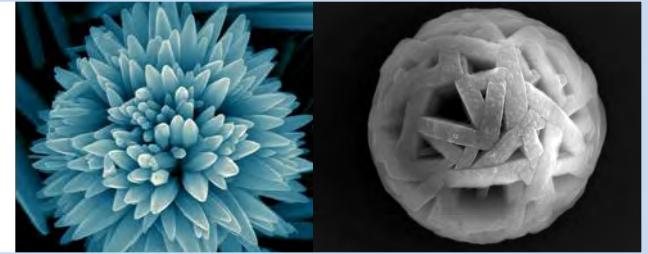


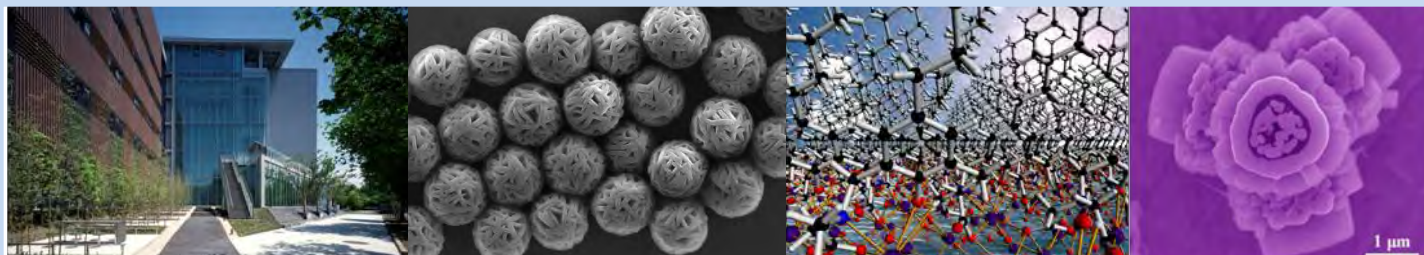
University of Tsukuba



HIROSHIMA UNIVERSITY

Collaboration with Overseas Partners

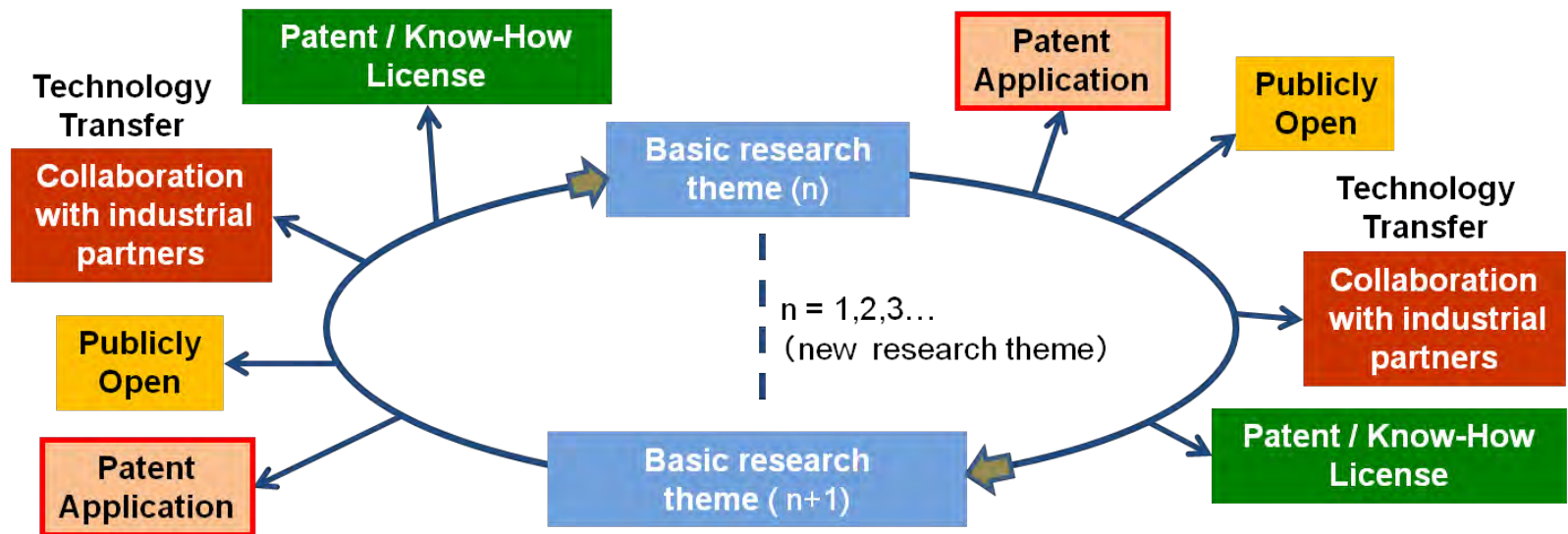
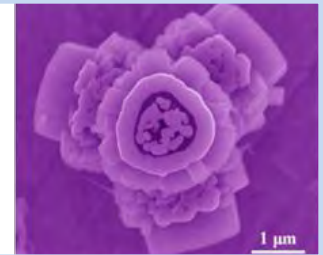




Intellectual Property and Licensing

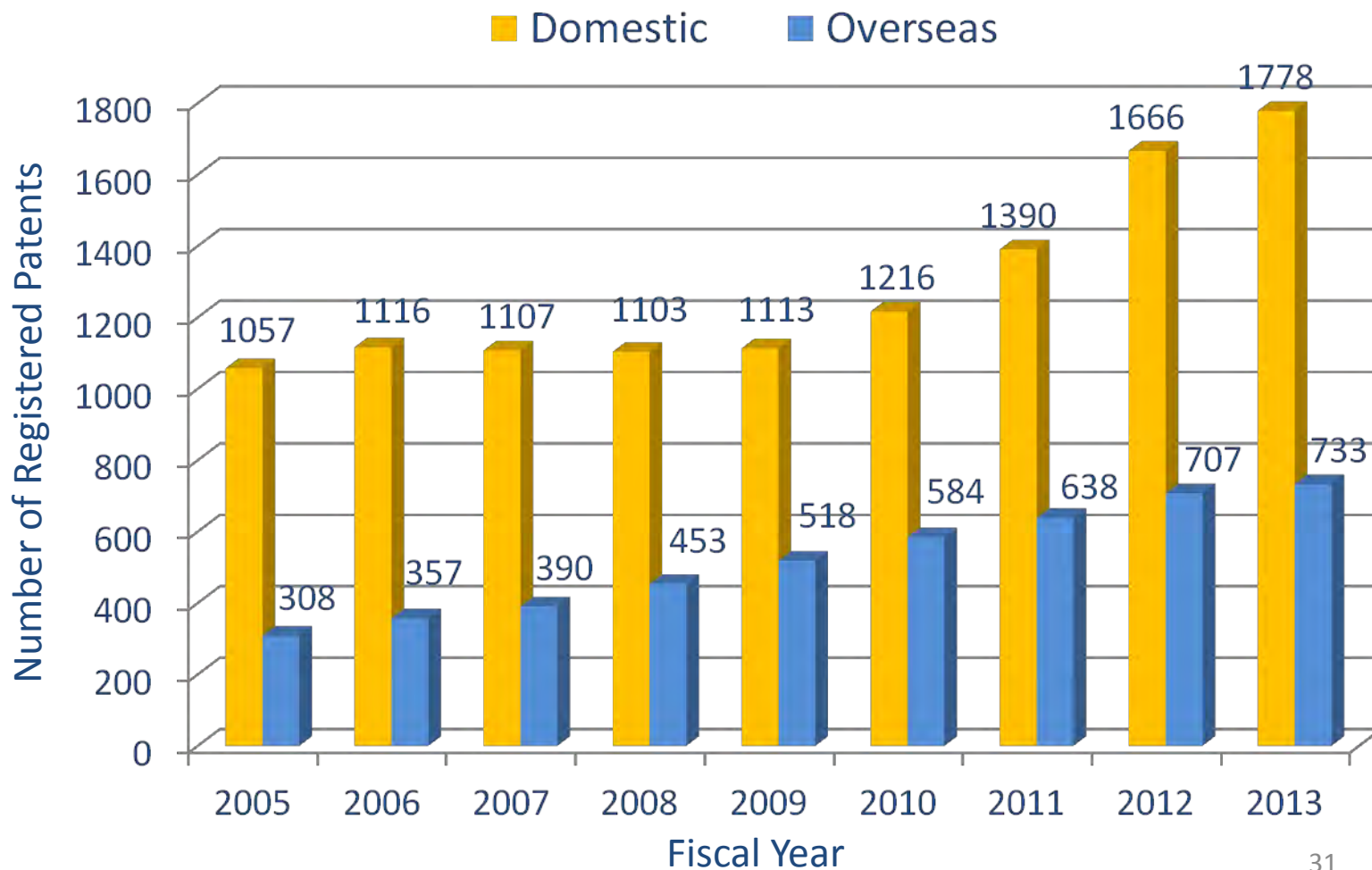
National Institute for Materials Science (NIMS)

NIMS Intellectual Property Policy

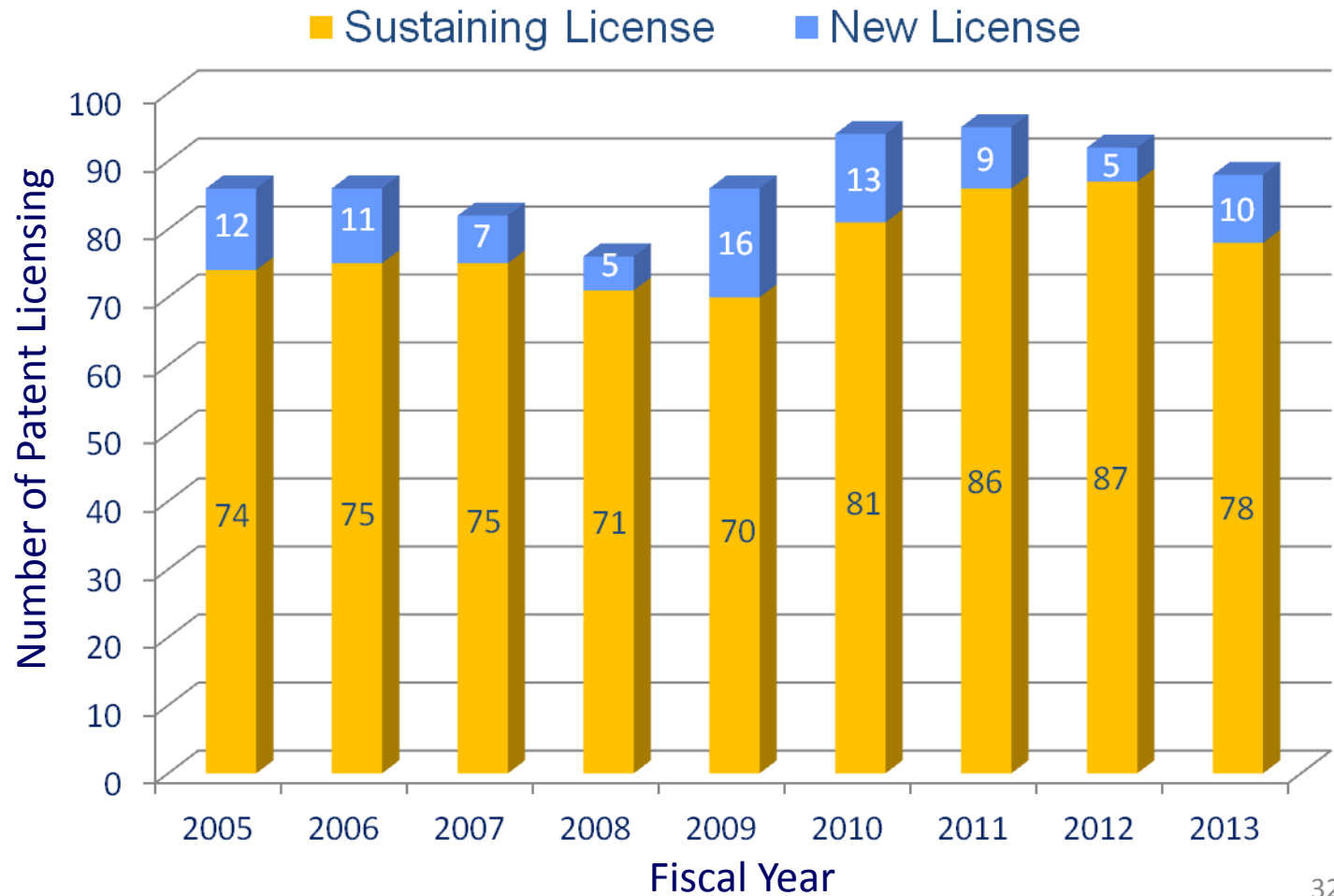
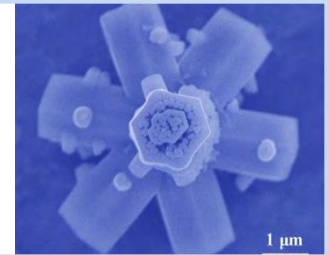


- NIMS will not apply the “process inventions” for patent but keep them as “know-how”, because it is very difficult to find patent infringement for process invention.
- Joint Inventions with Collaborator are jointly owned.
- NIMS IP policy for the joint invention is very flexible and well appreciated by many global companies.

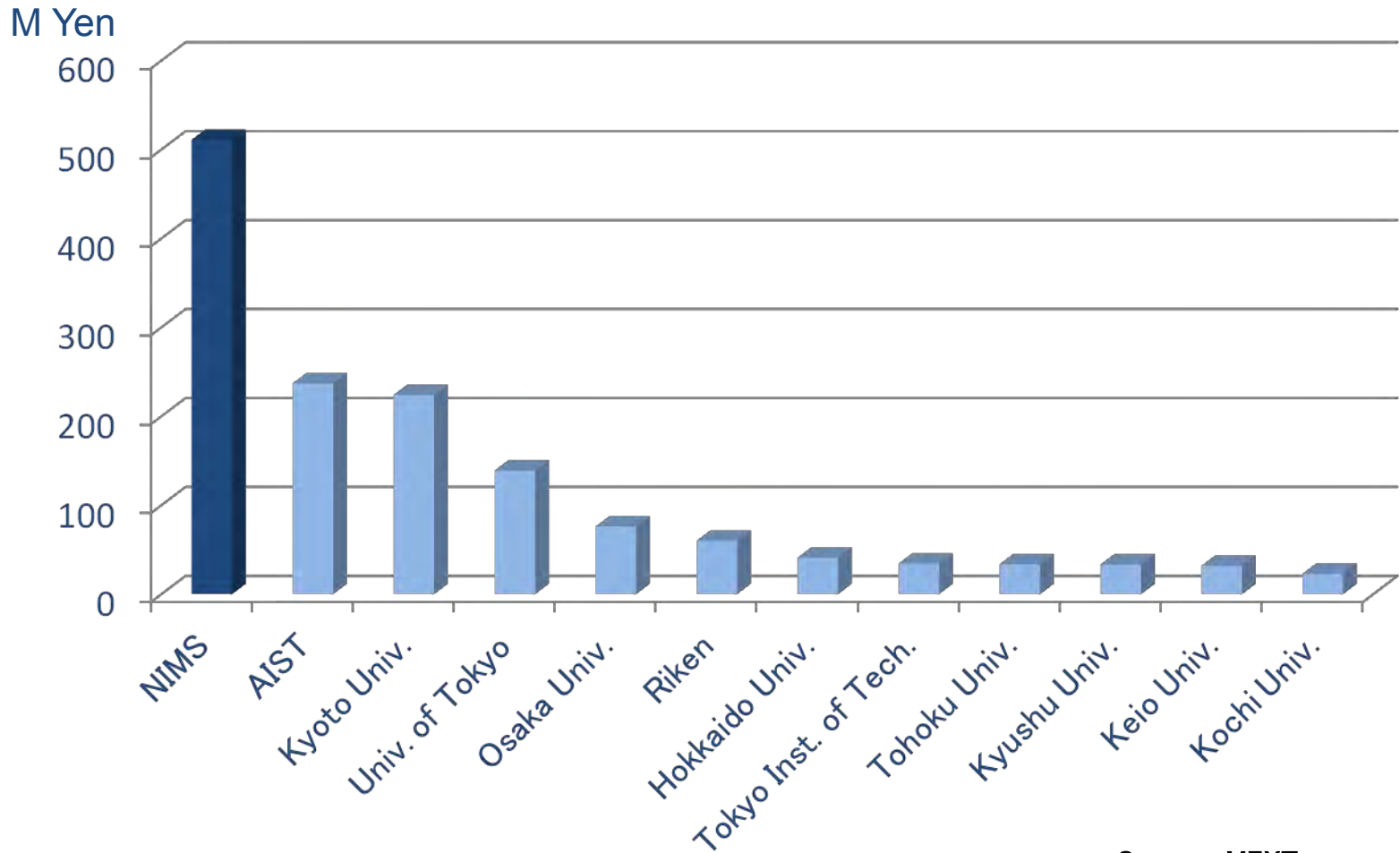
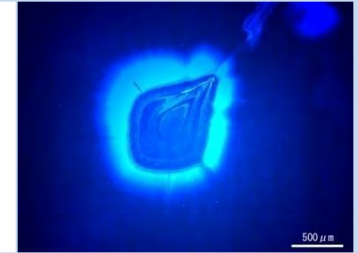
Accumulated Registered Patent Trend



Annual Patent Licensing Trend

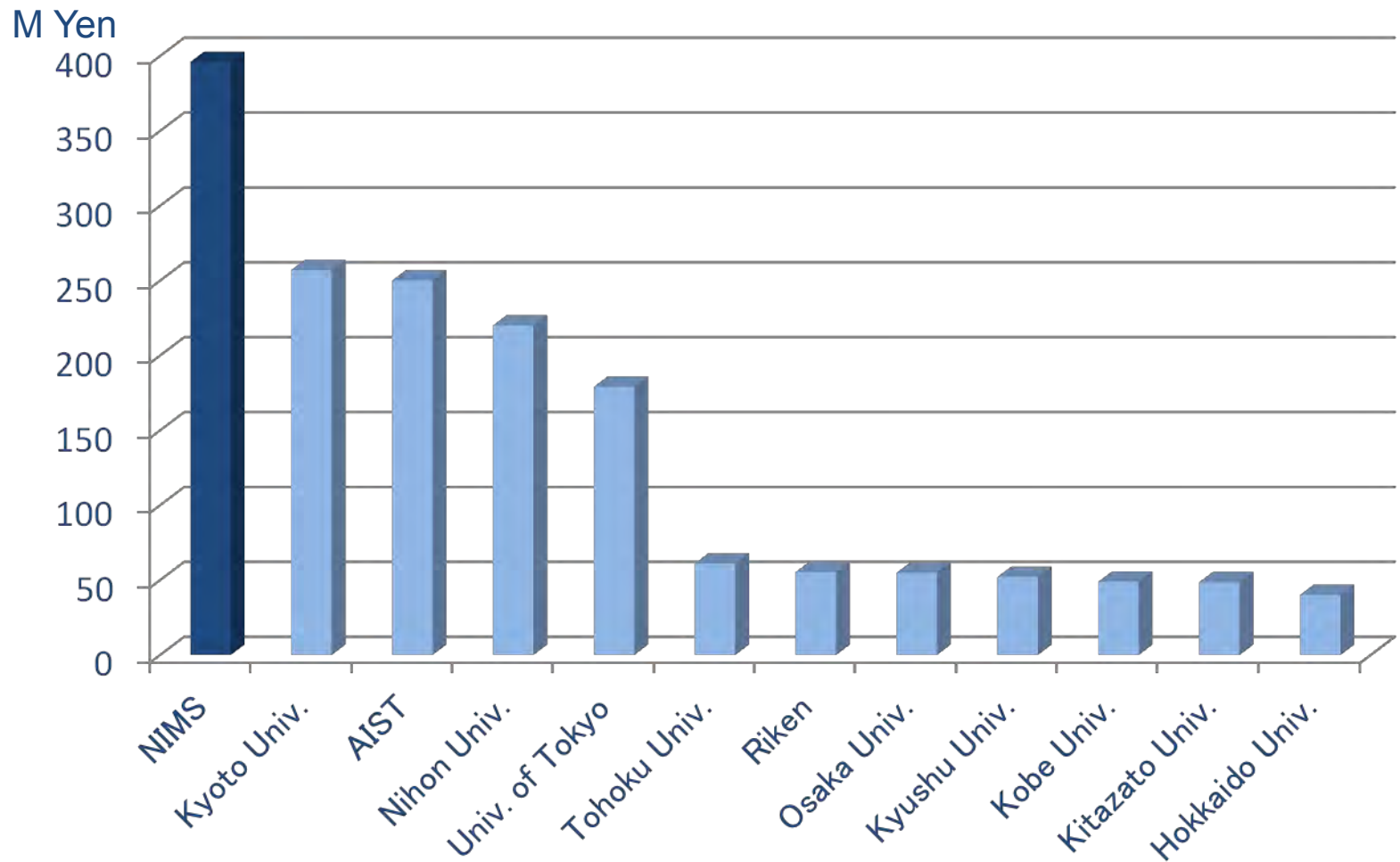
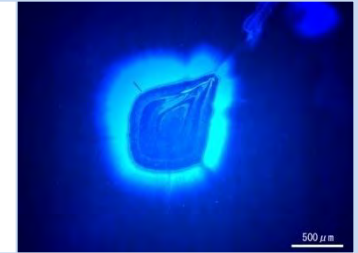


License Income (FY2011)



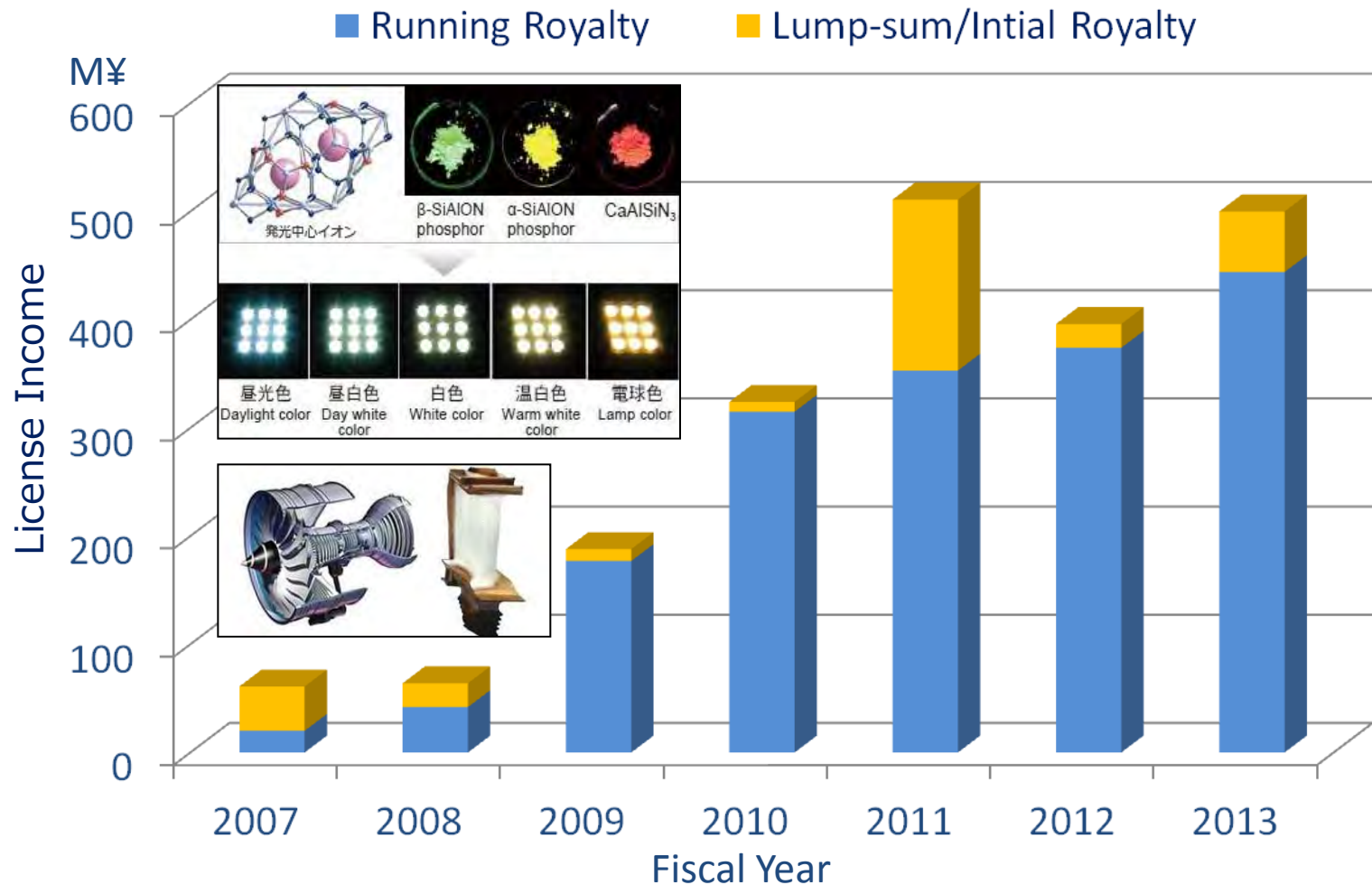
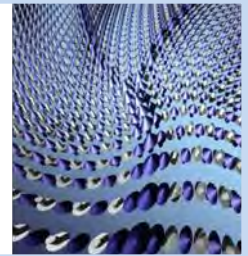
Source : MEXT

License Income (FY2012)



License Income Trend

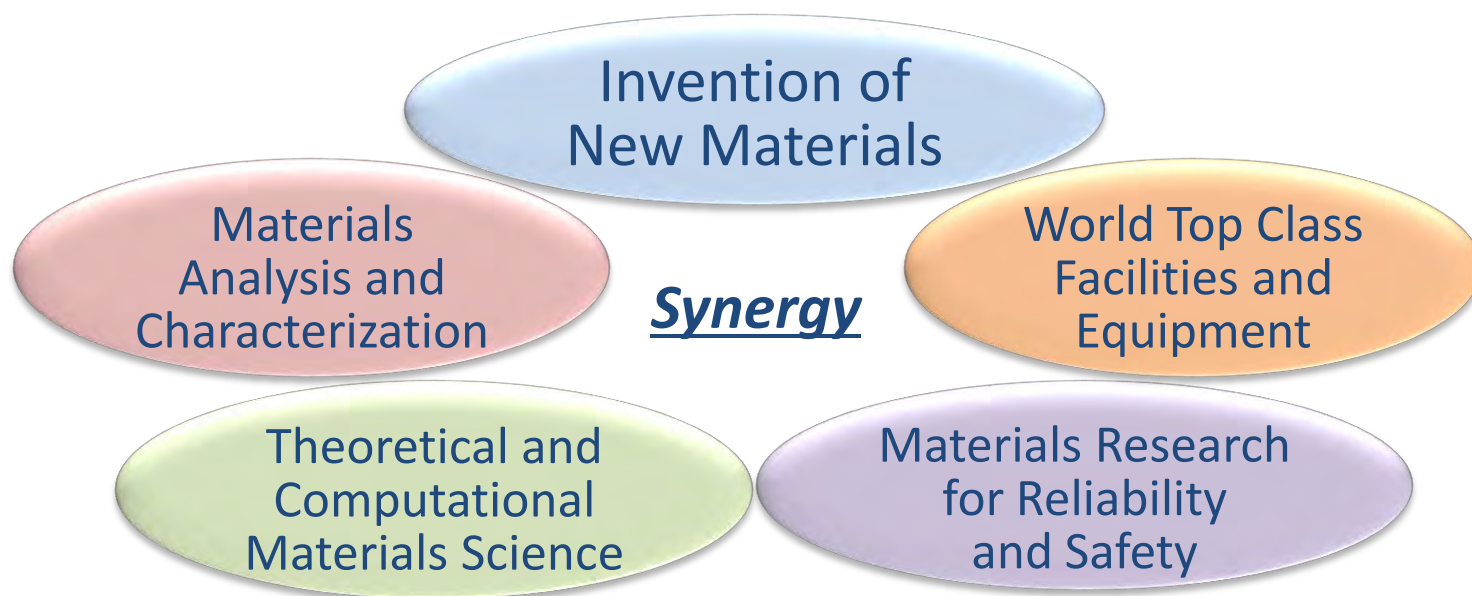
The running royalty is an important factor to measure if the technology-transfer is successfully executed



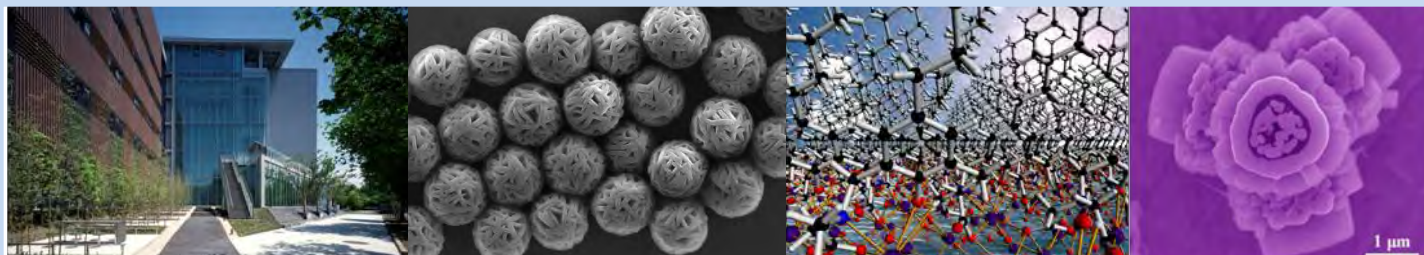
Core Competences of NIMS



➤ Synergy of Five Key Research Fields



- One of the most Globalized Research Institute in Japan
- Variety of Technology Transfer Schemes
- Strong Patent Portfolios



Thank you for your attention.

承蒙垂听, 非常感谢