

NIMS and Four Chemical Companies to Develop a Framework for Promoting Open Innovation

**—Further Enhancing Polymer Material Performance by Addressing Issues Common to
Chemical Companies, with NIMS Playing a Pivotal Role—**

The National Institute for Materials Science (NIMS) (headquartered in Tsukuba, Ibaraki; Kazuhito Hashimoto, President), Mitsubishi Chemical Corporation, Sumitomo Chemical Company, Ltd., Asahi Kasei Corporation, and Mitsui Chemicals, Inc. signed a memorandum of understanding on the operation of the Materials Open Platform (MOP) on June 19, 2017. The MOP initiative is expected to promote open innovation in the chemical industry.

Abstract

Dramatic changes in the industrial environment driven by the development of AI, big data and IoT are making it difficult for individual manufacturers to engage in basic research leading to transformational innovations in materials ensuring international competitiveness. Chemical companies often share similar medium- to long-term issues that are difficult for them to address alone. The goal of the MOP is to respond to these common issues by developing fundamental technologies leading to innovation by facilitating large-scale collaboration across the chemical industry in Japan. The MOP will also support the global competitiveness of Japanese chemical companies by promoting the pursuit of bilateral collaboration to leverage research accomplishments produced by MOP initiatives for their specific needs. In addition, the MOP will work to resolve the various global issues Japan is facing.

NIMS and the four chemical companies aim to further enhance the performance of polymer materials in FY2017 under the MOP framework. To achieve this, they will jointly gather data on various aspects of polymer materials, such as their structures, physical properties and alterations. They will then analyze the data using materials informatics.

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<Regarding the MOP>

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Outline of the Materials Open Platform (MOP) to be implemented by NIMS and the chemical industry

June 19, 2017

National Institute for Materials Science
President Kazuhito Hashimoto

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Society 5.0 (super-smart society)

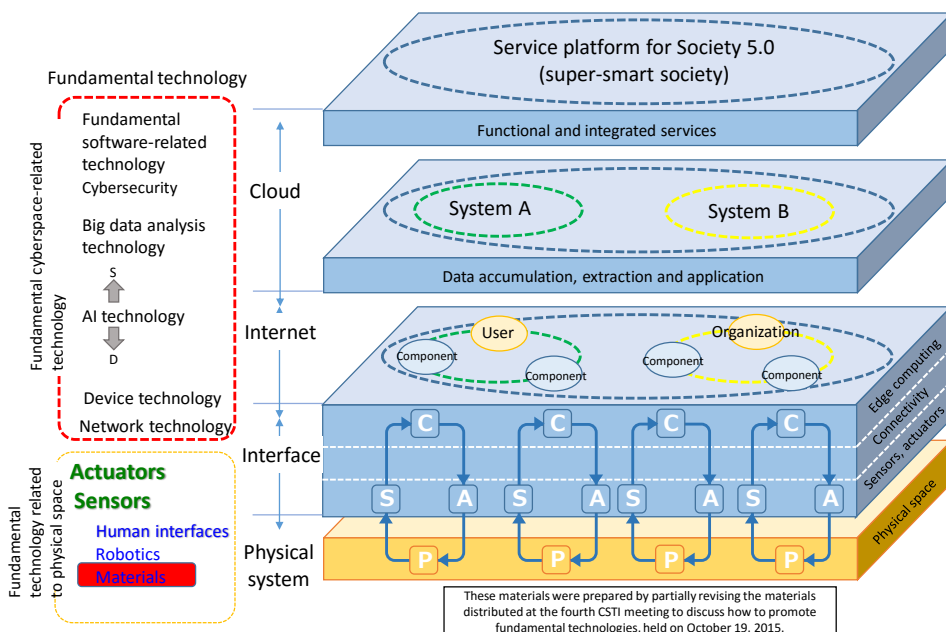


-Japan's "Society 5.0" initiative

Super-smart society: a society resulting from the elaborate integration of cyberspace and physical space



Society 5.0 (super-smart society) service platform



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Industry expectations for universities and national R&D institutes

Transforming industry-academia collaboration from “individual-to-organization collaboration” to “organization-to-organization collaboration”

Industry will increase investment in, information sharing and personnel exchanges with universities and R&D institutes, if **organization-to-organization collaboration frameworks** similar to those in Europe and the US can be built.



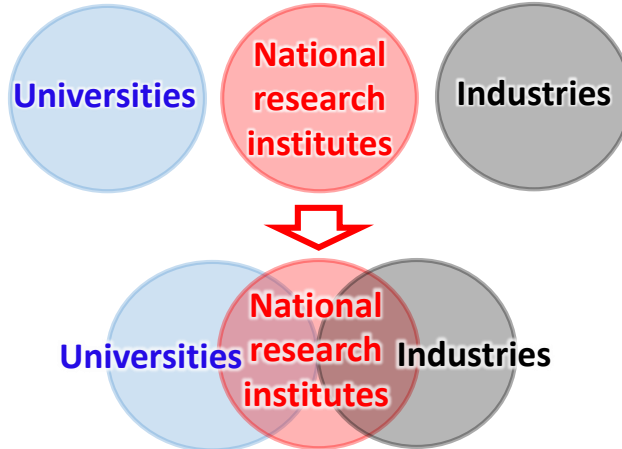
Source: The February 16, 2016 report of the Japan Business Federation

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Japan's national innovation system

National research institutes to serve as platforms for industry-academia collaboration

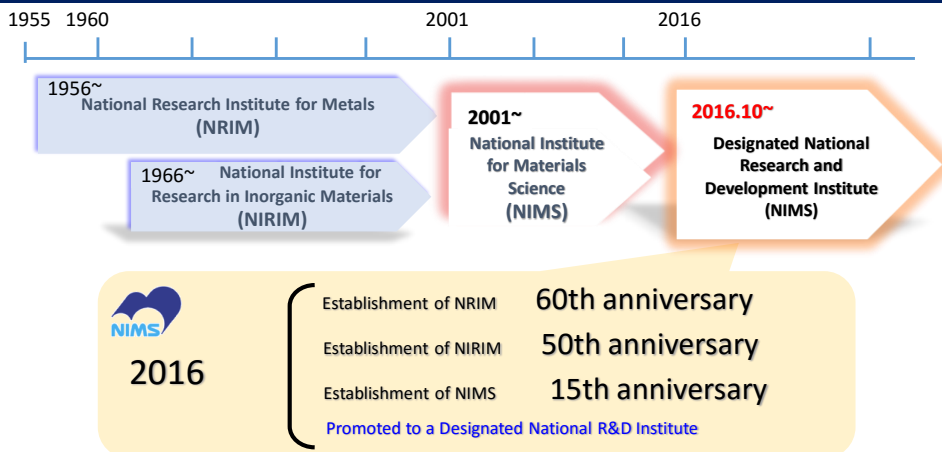
2014 Japan Revitalization Strategy



R&D institutes will play a greater role in facilitating collaboration.

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NIMS as a designated national R&D institute



Missions of designated national R&D institutes (source: MEXT website)

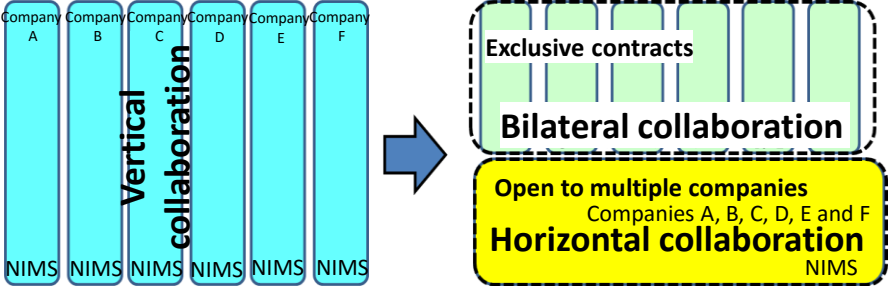
Said institutes will:

1. **Provide strong leadership for Japan's innovation system by creating venues which bring together human resources from industry, academia and government, as well as knowledge and funding.**
2. Promote the production, popularization and use of world-class R&D accomplishments.

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NIMS proposition: New framework for industry-government-academia collaboration
 —Open innovation at NIMS through collaboration between private companies in same industrial sector—

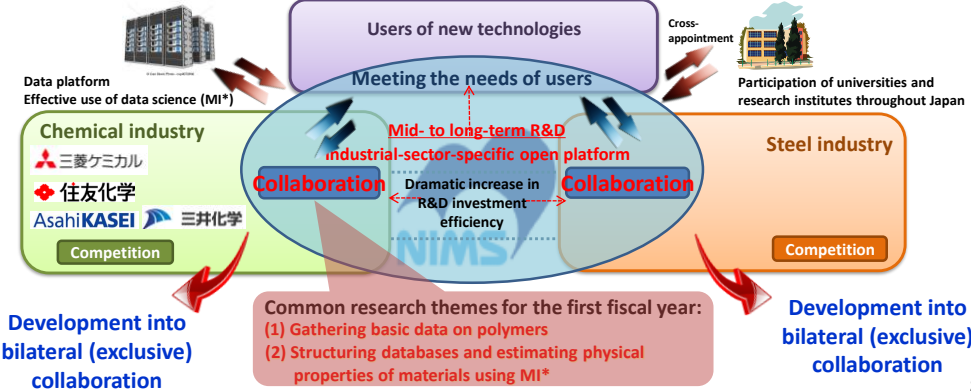
[Combining horizontal and vertical collaboration]



Involving as many companies as possible
 Japanese industry will increase R&D investment efficiency
 (thereby strengthening international competitiveness)

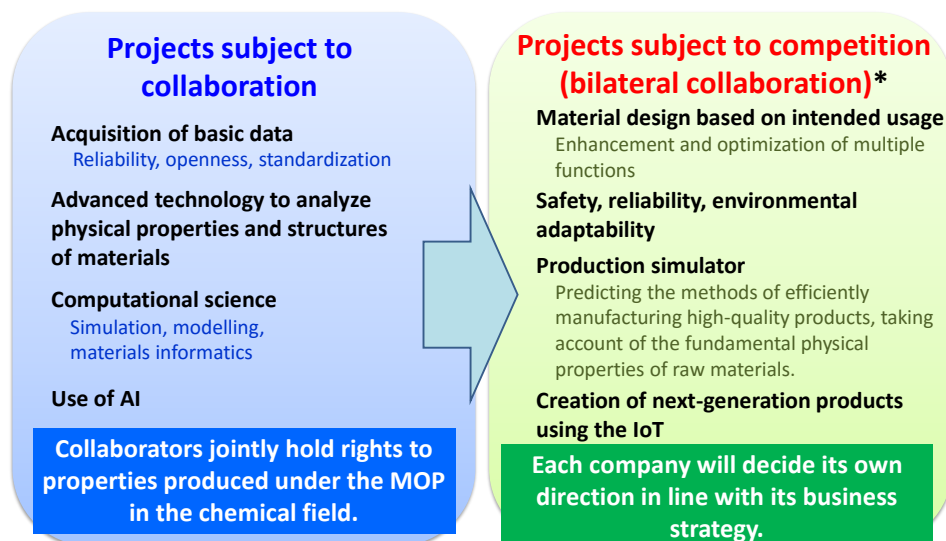
Materials Open Platform (MOP)
 —Developing a venue for transformational innovations in materials: linking basic research with the needs of private companies—

- NIMS has received vast amounts of investment from the national government. It should therefore **effectively use these national resources** to secure Japan’s international competitiveness.
 - NIMS, as a designated national R&D institute, will **establish industrial-sector-specific open platforms to facilitate collaboration between industries and universities** to carry out mid- to long-term R&D projects leading to transformational innovations.
 - **The key to the success of an open platform is determining attractive, far-sighted research themes.** If industry, academia and governments join force to pursue these themes, their efforts can be expected to strengthen the competitiveness of Japanese industry.
- NIMS determined MOP research themes in the chemical field after holding 27 discussion sessions with chemical companies.**



* MI: materials informatics (a field of study wherein big data is applied to materials research)

Projects subject to collaboration and competition



* Rules concerning the competition that follows the completion of chemical MOP projects will be determined in future discussions.

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Future prospects of the Materials Open Platform in the chemical field

[Expected effect of pursuing the FY2017 common themes]

Enhanced polymer material performance may offer potential solutions to some global issues and bring about dramatic and positive future changes in society.

Lighter and stronger polymers ⇒ Fuel-efficient automobiles and aircraft

Polymers that absorb optical, thermal, vibrational or sound energy ⇒ Comfortable clothing and living spaces

Polymers capable of controlling gas or ion permeability ⇒ Advanced medical treatments, solutions to agricultural/food problems, and the development of energy/water resources

NIMS and the four participating companies will lead the creation of new paradigms in the chemical industry by researching various types of materials. The goal of the initiative is to bring wealth and comfort to society in the future.

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