

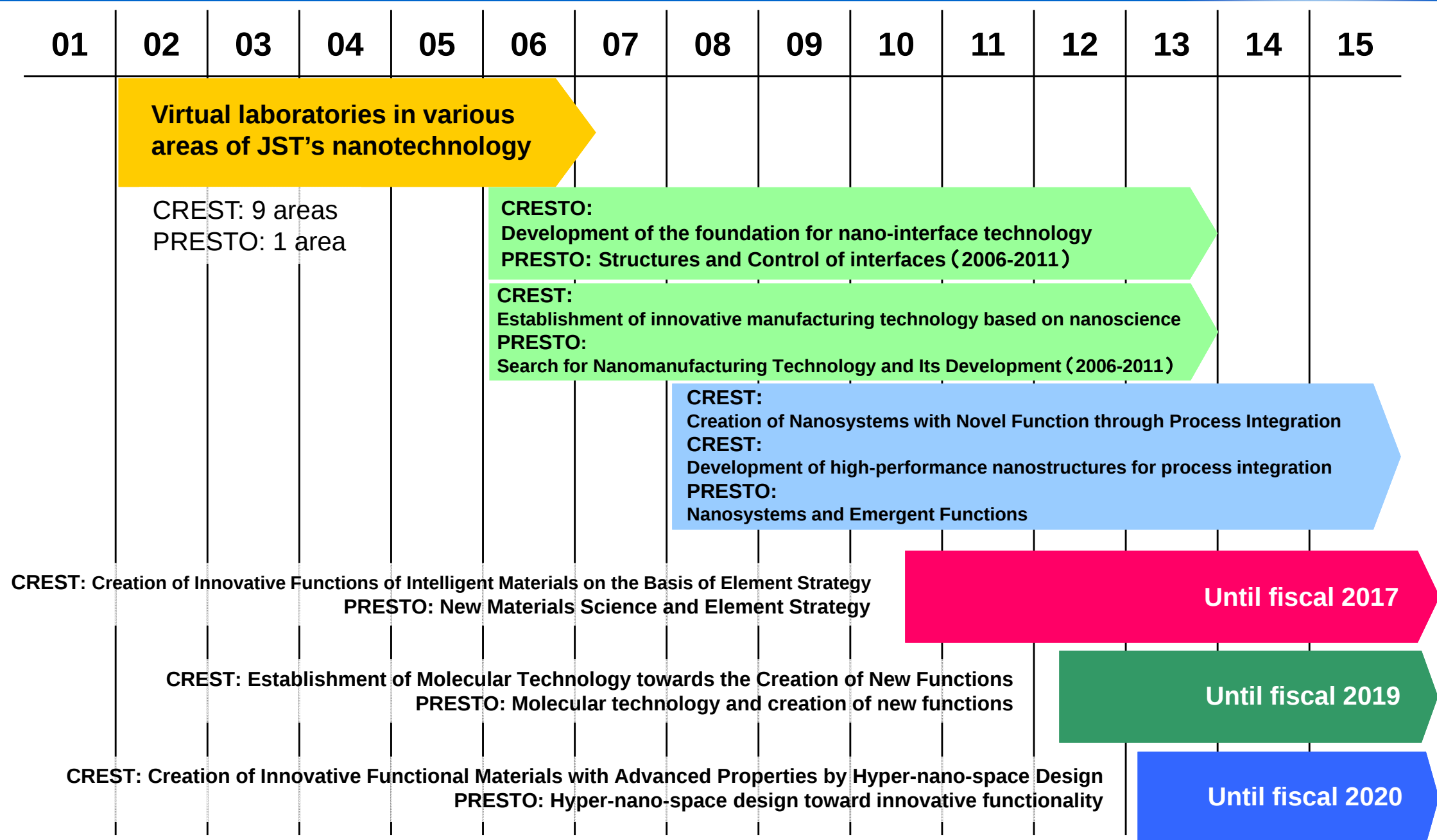
The JST logo is a large, light blue stylized 'JST' with a red circle above the 'J'.

Press Conference President of JST

September 19, 2013

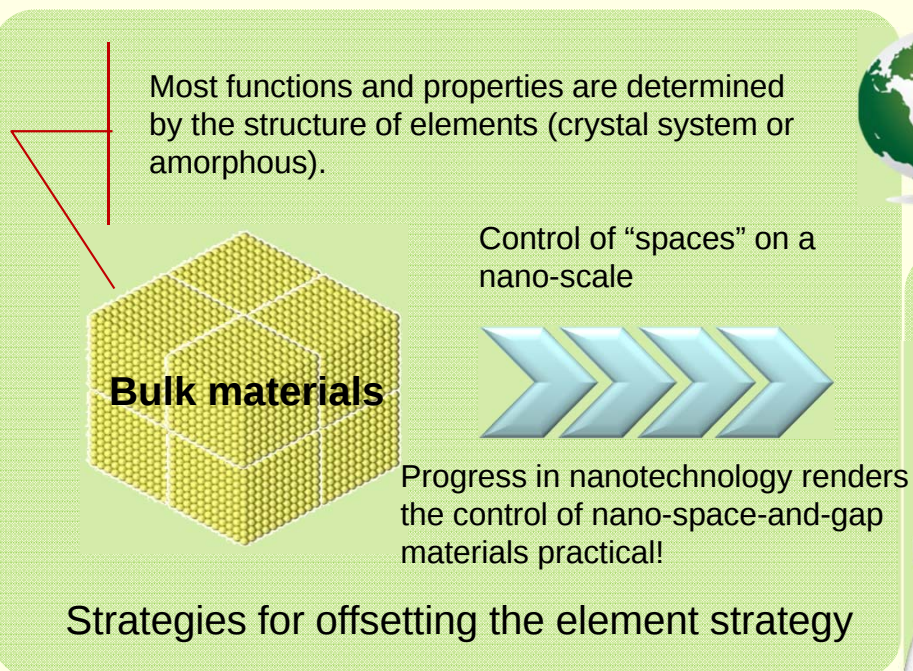
Japan Science and Technology Agency

Chronology of research on the field of nanotechnology and materials at JST (CREST and PRESTO)



What are space-and-gap-controlled materials?

They are the materials with new functions, which are not realizable in bulk materials, developed by controlling the shape, size, dimension, and configuration of the “spaces” linking the elements of the materials in nano-micrometer. The development of the revolutionary functional materials follows the consideration of their structure, functions, and interactions and assembly of all of them. Space-and-gap-controlled materials express the functions of separation, absorption, catalyst, storage, ion conduction, and energy conversion.

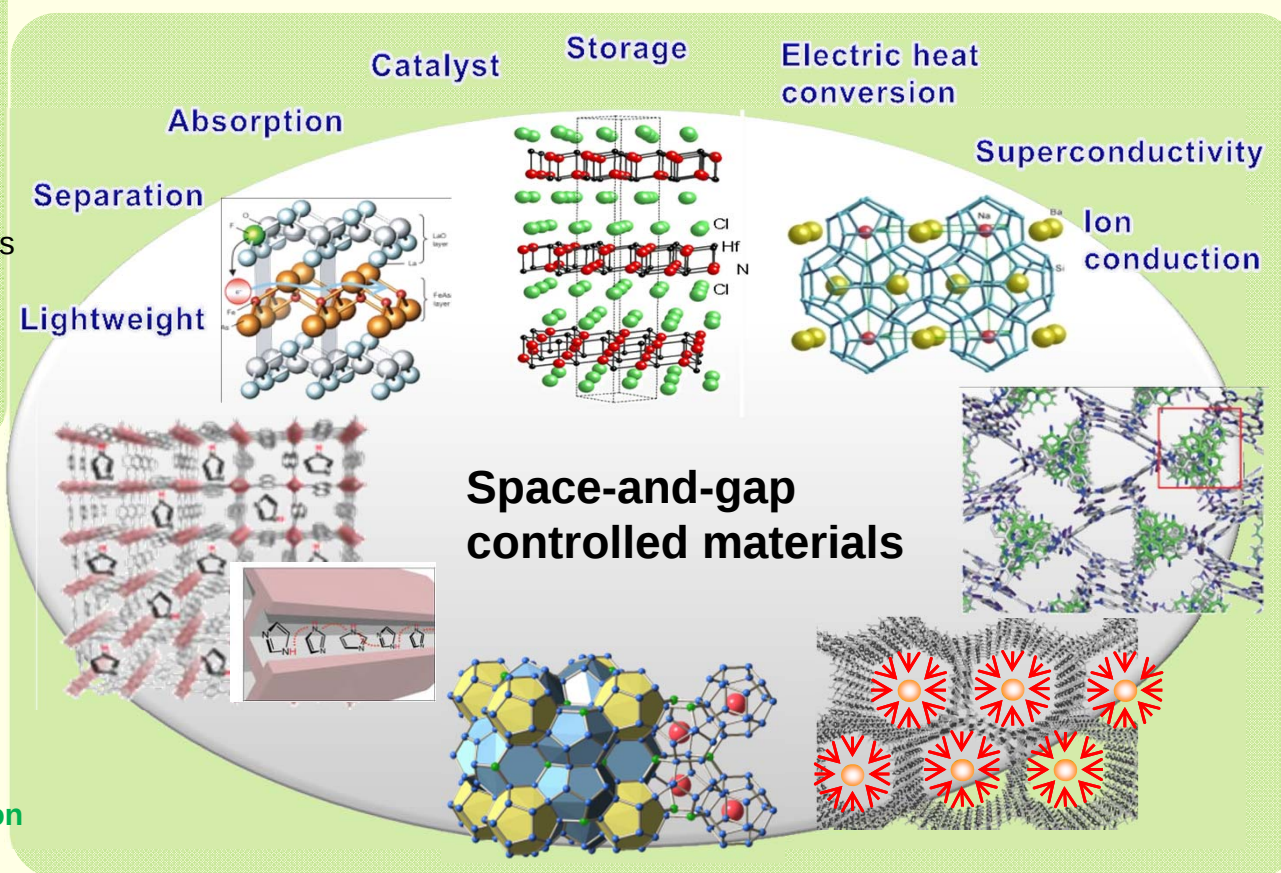


- **Conversion of energy:** Photoelectricity, electrochemistry, electric heat, and friction
- **Superconductivity:** Electronics, power storage, and power transmission
- **Storage of materials:** Catalyst, absorption, capture, transportation, and electrode materials
- **Reagency and synthesis:** Catalyst (MOF) and reactive sites
- **Structural materials:** Lightweight, high mechanical strength, high durability, and insulation
- **Separation:** Technology for separation and absorption of rare metal and gas



Strengths in the fields of environment, resources, and energy

“Expression of innovative, cutting-edge functions that are not realizable in bulk materials”



Space and Gap – from establishment of strategic objects to selection of research areas



■ Center for Research and Development Strategy (CRDS), Japan Science and Technology Agency

In July 2008, studied at the CRDS workshop

In December 2009, studied at the CRDS workshop

In March 2012, studied at the CRDS workshop

■ Ministry of Education, Culture, Sports, Science and Technology

In July 2011, studied at the Nanotechnology and material science technology committee

■ Council for Science and Technology Policy

In November 2012, in the CSTP's working group, dealt with space-and-gap-controlled materials as part of a technology area to be enhanced in the future

Strategic Objects in Fiscal 2013

Creation of new functional materials by means of technology for controlling spaces and gaps in advanced materials in order to realize selective material storage, transport, chemical separation, conversion, etc.

CREST “Creation of Innovative Functional Materials with Advanced Properties by Hyper-nano-space Design” (Research Supervisor: Tohru Setoyama)

PRESTO “Hyper-nano-space design toward innovative functionality” (Research Supervisor: Kazuyuki Kuroda)

□ Produce research outcomes resulting from the concepts generated in Japan

- Creation of fields and innovations that always draw world attention
- “Strategies”: Why are we involved in this R&D as a nation?
- The idea of “researchers assembling for the purpose of creating a new society”
 - Platforms for “the art of design and manufacturing (*monozukuri*)”

□ Assemble → integration and collaboration with different fields

- Harmonize visions (views of history, world, society, or substance), R&D systems (ecosystems constructed of platforms and networks), and globalization

□ Revise concepts in collaboration with academic circles and researchers' communities

□ Excellent outcomes generate a new strategy: PDCA Cycle