

Special Research Projects

IMS has special research projects supported by national funds. Three projects in progress are:

- (a) MEXT Nanotechnology Platform Program
Platform of Molecule and Material Synthesis
- (b) Inter-University Network for Efficient Utilization of Research Equipments

These two projects are being carried out with close collaboration between research divisions and facilities. Collaborations from outside also make important contributions. Research fellows join these projects.

(a) MEXT Nanotechnology Platform Program Platform of Molecule and Material Synthesis

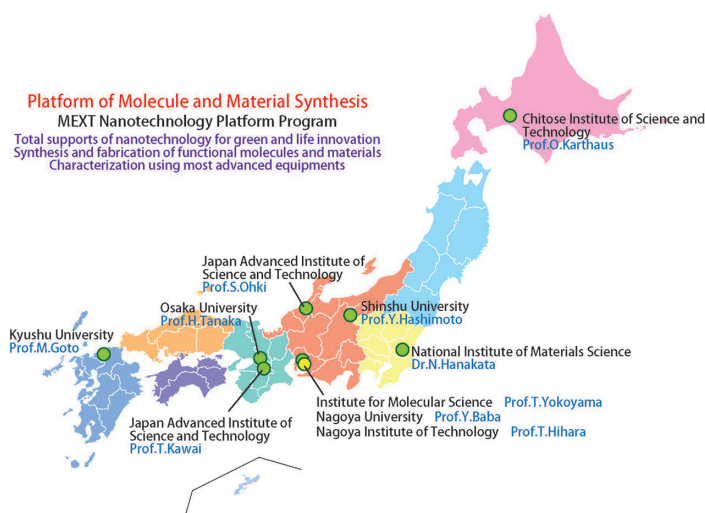
Since July 2012, Nanotechnology Platform Program supported by Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been conducted in order to promote public usage of various nanotechnology facilities. This program will continue until March 2022 and consists of three platforms of nanostructure analysis, nanoprocessing, and molecule and material synthesis, together with the management center of the platforms. Each platform consists of about ten organizations all over Japan. IMS conducts a representative core organization of the Molecule and Material Synthesis Platform. All the organizations in this platform are shown in Figure. In this platform, to promote green and life innovation researches using nanotechnology related techniques not only

for universities and government institutes but also for private companies, we will open various kinds of our facilities with total supports including molecular synthesis, materials fabrications, characterization, data analysis and scientific discussion. We will encourage applications not only to each element, but to combined usage of several supporting elements for biotechnology and green chemistry. In IMS, the number of accepted proposals in FY2019 amounted 155 (141 non-proprietary and 12 proprietary proposals, excluding inhouse applications from IMS) and the total number of days used for the supports is 2949 (2834 days for non-proprietary proposals and 116 days for proprietary ones).

List of Supports in IMS (FY2019)

Supporting Element		Responsible Persons	Charging Persons
Platform Management		T. Yokoyama	M. Ohara, Y. Toyama, Y. Shibata
Organization Management in IMS			Y. Hyodo, Y. Funaki
UVSOR Synchrotron Radiation	X-Ray Magnetic Circular Dichroism	T. Yokoyama	T. Koitaya, K. Yamamoto, O. Ishiyama
Microstructure Fabrication	Maskless Lithography with Step Gauge	H. Yamamoto	M. Aoyama, N. Takada, T. Kondo, S. Kimura, T. Kikuchi
	3D Optical Surface Profiler		
Equipment Development	Machine Shop		
Electron Microscopy	Field Emission Scanning Electron Microscopy	T. Yokoyama	O. Ishiyama, A. Toyama
	Low Vacuum Analytical Scanning Electron Microscopy		
	Field Emission Transmission Electron Microscope		S. Iki, T. Ueda, M. Uruichi
X-rays	Single Crystal X-Ray Diffractometer		M. Fujiwara
	Low Temperature Single Crystal X-Ray Diffractometer for Microcrystals		Y. Okano
	Molecular Structure Analysis using Crystalline Sponge Method		M. Fujita, T. Mitsuhashi
	Powder X-Ray Diffractometer	M. Fujiwara	
	X-Ray Fluorescence Analysis	T. Ueda	
	Small Angle X-Ray Scattering for Solutions	S. Akiyama	A. Mukaiyama

Electron Spectroscopy	Electron Spectroscopy for Chemical Analysis	T. Yokoyama	S. Iki
	Angle Resolved Ultraviolet Photoelectron Spectroscopy for Functional Band Structures	S. Kera, K. Tanaka	S. Ideta
Electron Spin Resonance	Pulsed High Field ESR	T. Yokoyama, T. Nakamura	M. Asada, M. Fujiwara, S. Iki, T. Ueda
	X-Band CW ESR		
	X, Q-Band CW ESR		
SQUID	Superconducting Quantum Interference Device		M. Asada, M. Fujiwara, S. Iki
Thermal Analysis	Differential Scanning Calorimeter (Solutions)	T. Yokoyama	T. Mizukawa, M. Uruichi, H. Nagao
	Isothermal Titration Calorimeter (Solutions)		M. Fujiwara
	Calorimeter for solids		T. Mizukawa, M. Uruichi, K. Fujikawa
Mass Spectrometer	Matrix Assisted Laser Desorption/Ionization Time of Flight Mass Spectrometer		M. Uruichi
Spectroscopy	Microscopic Raman Spectroscopy		T. Ueda
	Fourier Transform Far Infrared Spectroscopy		T. Mizukawa, M. Uruichi, K. Fujikawa
	Fluorescence Spectroscopy		T. Ueda
	Ultraviolet & Visible Absorption Spectroscopy		T. Ueda
	Circular Dichroism		T. Ueda
Lasers	Picosecond Laser		M. Yagi, S. Yanaka, Y. Isono
High Field NMR	800 MHz Solutions, Cryostat Probe	K. Kato	T. Mizukawa, M. Uruichi, H. Nagao
	600 MHz Solids	K. Nishimura	S. Izawa
	600 MHz Solutions	T. Yokoyama	M. Suda, D. Hirobe
Functional Molecular Synthesis and Molecular Device Fabrication	Organic Thin Film Solar Cells	M. Hiramoto	A. Izumiseki, N. Ohtsuka
	Organic Field Effect Transistors	H. Yamamoto	T. Koitaya, K. Yamamoto
	Functional Organic Synthesis	N. Momiyama, T. Suzuki	F. Takeiri
	Large Scale Quantum Mechanical Calculations	M. Ehara	A. Mukaiyama, Y. Furuike
	Magnetic Thin Films	T. Yokoyama	
	Metal Complexes	T. Kusamoto	
	Inorganic Materials	G. Kobayashi	
	Biomolecule System	S. Akiyama	
	Supplementary Apparatus in Instrument Center	T. Yokoyama	



(b) Inter-University Network for Common Utilization of Research Equipments

It is highly important to improve instrumental supporting environments for research and education in the field of science and engineering. Nowadays, advanced research instruments are indispensable for conducting researches and educations with high standard quality. To install such sophisticated instruments, tremendous amount of budgets would be necessary. In 2007, for constructing a national-wide network to provide easy accesses to high-level equipments to researchers and students in universities all over Japan, the five-year project “Functioning of Inter-University Network for Efficient Utilization of Chemical Research Equipments” was launched. The network maintains an internet machine-time reservation and charging system by the help of equipment managers and accounting sections in each university. 72 national universities as well as Institute for Molecular Science (total 73 organizations) all over Japan have been participating in the network. They are grouped into 12 local regions and in each region the regional committee discusses and determines the operation of

regional network systems with the hub university chairing. There is no barrier for every user to access to any universities beyond his/her regional group. From 2009, the registered equipments are open to the researchers and students of all the public (prefectural *etc.*) and private universities. Since 2010, the project has been renamed “Inter-University Network for Common Utilization of Research Equipments” still keeping the original strategy and stable functioning. Since 2018, the institutions that provide research facilities are open to public and private universities. Currently, the network is organized by 78 organizations. The number of registered users amounts to 14,000 in 431 universities/institutions/companies covering over 3,800 laboratories in Japan (June, 2020). Network usage reaches about 170,000 times a year, and the number continues to grow. Moreover, we have actively provided various opportunities where technical staffs and users can improve their technical skills and frankly communicate with each other.