

# Instrument Center

YAKUSHI, Kyuya  
YAMANAKA, Takaya  
TAKAYAMA, Takashi  
FUJIWARA, Motoyasu  
OKANO, Yoshinori  
MIZUKAWA, Tetsunori  
MAKITA, Seiji  
NAKANO, Michiko  
SAITO, Midori  
UEDA, Tadashi  
OTA, Akiyo  
NAKAGAWA, Nobuyo

Director  
Technical Associate  
Technical Associate  
Technical Associate  
Technical Associate  
Technical Associate  
Technical Associate  
Technical Associate  
Technical Associate  
Secretary  
Secretary



Instrument Center was organized in April of 2007 by integrating the general-purpose facilities of research center for molecular-scale nanoscience and laser research center for molecular science. The mission of Instrument Center is to support the in-house and external researchers in the field of molecular science, who are utilizing general-purpose instruments such as ESR, x-ray diffractometer, fluorescence spectrometer, *etc.* The staffs of Instrument Center maintain the best condition of the machines, and provide consultation for how to use them. The main instruments are NMR (JEOL JNM-LA500, JEOL JNM-LA400), mass spectrometer (Voyager DE-STR), powder x-ray diffractometer (Rigaku RINT-Ultima III), circular dichroic spectrometer (JASCO JW-720WI), differential scanning calorimeter (VP-DSC), and isothermal titration calorimeter (iTC200) in Yamate campus and ESR (Bruker E680, E500, EMX Plus), SQUID (Quantum Design MPMS-7, MPMS-XL7minTK), powder (MAC Science MXP3) and single-crystal diffractometers (Rigaku Mercury CCD-1 and CCD-2, RAXIS IV, 4176F07), thermal analysis instrument (TA TGA2950, DSC2920, SDT2960), fluorescence spectrophotometer (SPEX Fluorogll), x-ray fluorescence spectrometer (JEOL JSX-3400RII), UV-VIS-NIR (Hitachi U-3500) spectrophotometer, excimer+dye laser system (LPX105i+LPD3002), Nd-YAG+OPO laser (GCR-250), excimer laser (Complex 110F), and picosecond tunable laser system (TSUNAMI-TIATN-TOPAS) in Myodaiji campus. Instrument Center provides liquid nitrogen and liquid helium using helium liquefiers. The staffs of Instrument Center provide consultation for how

to treat liquid helium, and provide various parts necessary for low-temperature experiments. Instrument Center supports also the Inter-University Network for Common Utilization of Research Equipments.

In the fiscal year of 2009 (April 2009 to March 2010), Instrument Center introduced new equipments shown below: 600 MHz NMR spectrometer for biological molecules (JEOL JNM-ESA600), pulse ESR system for Q-band (Bruker E680), Raman microscope (Renishaw INVIA REFLEX532) in Myodaiji campus. Another Raman spectrometer (JASCO NR-1800), with which low-frequency Raman is available, was transferred from Nishi group. The fluorescence spectrometer (SPEX Fluorogll) was also renewed. Instrument center is constructing original instruments collaborating with research groups inside and outside IMS. Time-resolved ESR spectrometer was constructed by Nakamura group of IMS, and calorimeter system under high-magnetic field (15 T) and very low temperature (20 mK) was constructed by Nakazawa group of Osaka University. The former is used for studying photo-excited state of organic molecules, and the latter will be used for the study of organic superconductors, organic magnets, and other materials. In the fiscal year of 2009, Instrument Center accepted 63 applications from 34 institutions outside IMS. The users mainly used SQUID (22), ESR (18), x-ray diffractometer (17), circular dichroism spectrometer (6), thermal analysis instrument (4), mass spectrometer (4), NMR (2), and Excimer-dye laser (3), where the numbers in parenthesis shows the number of use by external users.



**Figure 1.** 600 MHz NMR spectrometer (JEOL JNM-ESA600).



**Figure 2.** Pulse ESR for Q-band (Bruker E680).



**Figure 3.** Raman microscope (Renishaw INVIA REFLEX532).