(Ver. April 2016)

Table of Research Areas

Group	Code	Subgroup	Keywords
● Accelerator Physics/Beamline Engineering			
Accelerator Physics	A01.10	Linear Accelerator	Electron Gun, RF Acceleration, Magnet, Vacuum Technology, Diagnosis Technology
	A01.20	Circular Accelerator	Orbit Analysis, RF Acceleration, Magnet, Vacuum Technology, Diagnosis Technology
	A01.30	Accelerator Control	Control Equipment, Network, Control Software
	A01.40	Next Generation Light Source	Accelerator for Next Generation Light Source, Free Electron Laser
	A01.50	Radiation Source	Gamma Source, Positron Source, Neutron Source
	A01.60	Laser Electron Source	Inverse Compton Scattering
	A01.90	Other	
Beamline Engineering	A02.10	Synchrotron Light Source	Insertion Device, Bending Magnet
	A02.20	Beamline Engineering	Front End, Transport Channel, Vacuum Engineering, Thermal Stress Analysis, Beam Diagnosis
	A02.30	Optics	Optical Devices (Spectrograph, Polarizer, Condenser Lens), Optical Elememts, Measurement Method Development
	A02.40	Detectors	Gas Detector, Solid State Detector, Fast Time-resolved Measurements
	A02.50	Control Systems	Hardware, Software, Interlock
	A02.60	Radiation Physics	X-ray Standard Field, Shielding Calculations
	A02.70	Beamline Diagnosis	X-ray Intensity Monitor, Beam Position Monitor
	A02.90	Other	
Elementary Particles, Nuclear Science	A03.10	Particle Physics	Elementary Particles, Cosmic Rays, High Energy Physics, Astrophysics
	A03.20	Nuclear Science	Nuclear Physics
	A03.90	Other	
● Synchrotron Radiation Research			
Life Science	A10.10	Structural Biology (crystal)	Protein Structure/Function, Enzyme Reactions
	A10.20	Structural Biology (hard-condensed matter)	Muscles, Two-dimensional Membrane, Osteoblasts, Protein Solution, Structure/Function
	A10.30	Biophysics	Biomembranes/Receptors/Channels, Folding, Single Molecule Measurement
	A10.40	Analyses of Medicinal Effects	Medicine - Protein Complex Structures, Medicinal Molecular Design, Genome Medicine
	A10.50	Cell Biology	Cell Structure, Cell Function
	A10.60	Radiobiology	Radiation Effects on Cells and DNA
	A10.70	Biological Imaging	Imaging, Tomography, X-ray CT
	A10.90	Other	
Medical Applications	A20.10	Bioimaging	Imaging, Tomography, X-ray CT
	A20.20	Radiodiagnosis	Medical Diagnosis and Imaging, Fine Structures of Affected Area
	A20.30	Radiation Therapy (Radiotherapy)	Radiation Effects
	A20.40	Medical Materials	Medical Materials, Dental Materials, Biofunctional Materials
	A20.90	Other	
Materials Science and Engineering	A30.10	Structural Properties	Crystal Structures, Electron Density Distribution
	A30.12	Structural Phase Transitions	Structural Phase Transitions, Magnetic/Electronic Phase Transitions, Structural Fluctuations, Time Resolved Structural Analysis
	A30.14	Nanostructured Materials	Quantum Nanostructures, Nanomaterials, Mesoscopic Systems, Molecular Structure, Gas
	A30.20	Surface and Interface Properties	Surface and Interface Structures, Surface Modulated Structures, Thin Film/Multilayer Structures, Surfactant Effects, Surface Roughness, Crystal Growth Process, Surface Melting, Surfaces as a New Material Phase
	A30.30	Random Material Structure	Amorphous Materials, Liquids/Melts, Glass, Gas, Supercritical Materials
	A30.35	Soft Material Properties	Soft Materials, Macromolecules, Organic Thin Films, Liquid Crystals
	A30.40	Electronic Structure	Electronic Structure, Band Structure
	A30.42	Semiconductor Properties	Semiconductor, Molecular Solids/Organic Semiconductors, Electronic Devices
	A30.45	Optical Properties (Solid State Photophysics)	Ionic Crystals
	A30.48	Dielectric Properties	Dielectric Materials, Structural Phase Transitions
	A30.50	Metal Properties	Metals, Quasicrystals, Imaging
	A30.55	Superconducting Properties	Superconducting Materials, Organic Superconducting Materials
	A30.60	Magnetic Properties	Magnetic Structures, Magnetic Materials, Magnetic Multilayers, Magnetic-Field-Induced Structural Phase Transition, Organic Magnetic Materials
	A30.65	Strongly Correlated Electronic Materials	
	A30.70	Grating/Atomic Dynamics	Phonon Properties, Elastic Waves, Atomic Diffusion
	A30.80	Nuclear Properties	Hyperfine Interactions, Nuclear Resonance, Mossbauer Effect, Nuclear Excitation
	A30.90	Other	
Chemical Science	A40.10	Atoms/Molecules	Atomic and Molecular Cluster Spectroscopy, Ionic Fragmentation, Atomic Process of Multiply-Charged Ions, Synchrotron Radiation Excited Chemical Reaction, Excited Molecular Structures
	A40.20	Inorganic Chemistry	Inorganic Solids, Metal Complexes
	A40.30	Organic Chemistry	Organic Solids, Organic Photochemistry
	A40.35	Macromolecular Chemistry	Macromolecular Structures, Fibers
	A40.40	Surface and Interface Chemistry	Surface Chemical Reactions, Catalysis, Chemical Process, Solution Chemistry, Gas Absorption
	A40.45	Electrochemistry	Electrochemical Reactions, Electrode Reactions, Battery Electrode Materials,
	A40.50	Chemical Analysis	Trace Element Analysis, State Analysis
	A40.55	Chemical State Analysis	Chemical Bonding, Lipid, Structure/Function
	A40.60	Infrared Materials	Molecular Vibrations, Infrared Microspectroscopy, Magneto-Optics
	A40.70	Irradiation Effects	Core Excitation, New Materials Development, Material Modification, X-ray CVD (Chemical Vapor Deposition)
	A40.90	Other	
Earth and Planetary Science	A50.10	Earth Science	Solid Earth Science, Crust/Mantle/Core Materials, Geology
	A50.20	Rocks/Mineralogy	Earth and Planetary Materials, Magma, Mineral Resources
	A50.30	High Temperature/High Pressure Properties	Viscosity, Sound (Sonic) Speed
	A50.90	Other	
Environmental Science	A60.10	Environmental Analytical Science	Microchemical Analysis, Mapping
	A60.20	Environmental Materials	Aerosol, Environmental Pollutants
	A60.30	Biological Materials	(Quantitative) Analysis of Trace Biological Molecules
	A60.90	Other	
Industrial Applications	A80.10	Electronics	Electronic Devices, Quantum Devices, Optical Elements, Storage Elements, Display Devices, Piezoelectric Elements, Device Evaluation
	A80.12	Semiconductor/Electronic Materials	Semiconductor Materials, Electronic Materials, Element Thin Films, Fluorescent Body
	A80.14	Magnetic Materials	Magnetic Materials, Magnetic Multilayers, Spin Electronics, Magnetic Devices
	A80.16	Superconducting Materials	Superconducting Materials, Superconducting Devices
	A80.20	Metals/Structural Materials	Metallic Materials, Structural Functional Materials, Machine Parts, Building Materials, Grating Strain, Residual Stress, Corrosion, Destruction, Imaging
	A80.30	Inorganic Materials	Inorganic Materials, Ceramics, Glass, Gas Absorbent Materials, Particles, Colloid
	A80.32	Organic Material	Macromolecule, Organic Material, Liquid Crystal, Rubber, Fiber, Film, Imaging
	A80.34	Catalytic Chemistry	Industrial Catalysts, Catalytic Activity, Surface Chemical Reactions
	A80.36	Electrochemistry	Electrochemical Reactions, Electrode Reactions, Battery Electrode Materials
	A80.40	Environmental Materials	Environmental Analysis, Pollution Treatment, Environmental Catalysts, Recycling, Environmental Load Reducing Technology
	A80.42	Energy/Resources	Fuel Cell, Solar Cell, Device
	A80.50	Pharmacy	Protein Crystallization, Medicated Low Molecular Weight Crystals, Medicine
	A80.60	Food/Daily Products	Food, Cosmetics, Daily Products
	A80.80	Fine Manufacturing, Irradiation Effects	Lithography, LIGA, Electrocrystallization, X-ray Irradiation Reaction
	A80.90	Other	
Other	A90.10	Archaeology	Archaeology
	A90.20	Identification Science	Forensic Science
	A90.50	Safety Control	
	A90.90	Other	

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Table of Research Methods

Group	Code	Subgroup	Keywords
X-ray Diffraction	M10.10	Single Crystal Diffraction	MAD, X-ray Crystal Structure Analysis
	M10.20	Powder Diffraction	Rietveld Analysis, MEM, Energy Dispersive Diffraction, Surface Diffraction In-situ Observation
	M10.30	Surface/Interface Structure Diffraction	CTR, Grazing Angle X-ray Diffraction
	M10.40	Standing Wave Method	Surface Structure Analysis of Adsorbed Atom, Analysis of an Interface Structure
	M10.50	Reflectivity Method	Depth Distribution Analysion of Electron Density, Anomalous Scattering
	M10.80	Distortion Analysis	Microbeam Diffraction, Strain Distribution and Morphology
	M10.90	Other	Reciprocal-Lattice Space Imaging, Time-resolved Diffraction, Domain Size
X-ray Scattering	M20.10	Small Angle Scattering	Small Angle Scattering, GISAXS, simultaneous SAXS/WAXS measurement
	M20.20	Middle Angle Scattering	Amorphous / Liquid Scattering
	M20.30	Diffuse Scattering	
	M20.90	Other	Speckle
Magnetic Scattering	M25.10	Magnetic Scattering	Magnetic Diffraction, Magnetic Resonant Scattering
	M25.20	ATS Scattering	
	M25.90	Other	
Inelastic Scattering	M30.10	Inelastic Scattering	High Resolution Inelastic Scattering
	M30.20	Nuclear Resonant Scattering	Nuclear Excitation
	M30.30	Compton Scattering	Magnetic Compton Scattering
	M30.40	Emission Spectroscopy	Resonant Inelastic X-ray Scattering, Lifetime Width Free XANES, Soft-X-ray Emission Spectroscopy
	M30.90	Other	
X-ray/Soft X-ray Absorption Spectroscopy	M40.10	XAFS	XANES, DAFS, Mapping
	M40.20	X-ray Fluorescence Analysis	Elemental/Mass Analysis, Chemical State Analysis, Mapping
	M40.30	Magnetic Absorption	Magnetic Circular Dichroism, LS Decoupling, Mapping
	M40.40	Soft X-ray Spectroscopy	
	M40.50	Infrared Spectroscopy	Infrared Microscope, Infrared Spectro-microscopy, Low-temperature / High-pressure / High-magnetic Field Infrared Spectroscopy
	M40.90	Other	
Photoelectron Spectroscopy	M50.10	Photoelectron Spectroscopy	Hard-X-ray PES, Resonant PES, Soft-X-ray PES, Real-time PES
	M50.20	Photoelectron Emission Microscopy (PEEM)	Micro-XAFS, Micro-PES, Magnetic Imaging, Imaging of Electronic Structures
	M50.30	Photoelectron Diffraction / Photoelectron Holography	2D-PES, Auger Electron Diffraction, Stereo-Microscopy
	M50.40	Coincidence Spectroscopy	Photoelectron-Photoion Coincidence Imaging, TOF, Photoelectron-Photoion Coincidence Spectroscopy
	M50.90	Other	
X-ray Imaging	M60.10	X-ray Topography	White beam, plane wave, Microbeam topography
	M60.20	X-ray CT	Micro-CT, Phase-contrast CT, Refraction-contrast CT
	M60.30	X-ray Holography	Fourier transform holography, Holographic microscopy
	M60.60	X-ray Microscopy	Phase contrast, Spectro-microscopy, Scanning microscopy
	M60.90	Other	
X-ray Optics	M80.10	Diffraction / Scattering / Absorption	Measurement Method, Basic Theory
	M80.20	Resonant Scattering	Anomalous Scattering / Diffraction Principle
	M80.30	Phase Optics	Interferometer, Coherence
	M80.40	Quantum Optics	Nonlinear Optics, Intensity Fluctuation
	M80.90	Other	
Extreme Environment	M85.10	High Temperature, High Pressure, Strong Magnetic Field	Large-volume Press, Energy-dispersive X-ray Diffraction, X-ray Radio-graphy
	M85.90	Other	
Other	M90.90		