■Public Beamlines

<table>
<tr><th>No.</th><th>Beamline name</th><th>Research areas</th></tr>
<tr><td colspan="3">Experimental station/system
Light source (energy range at sample position, etc.)</td></tr>
<tr><td rowspan="2">1</td><td>BL01B1 : XAFS I</td><td>Wide energy range (3.8-113 keV), XAFS of dilute systems and thin films, Time-resolved XAFS by quick scan (time-resolved QXAFS), Depth-resolved XAFS, XAFS at low and high temperatures, Simultaneous XAFS and XRD measurements, Simultaneous XAFS and IR measurements</td></tr>
<tr><td colspan="2">XAFS measurement system, Ionization chambers, Lytle detector, Multi-element Ge solid-state detector, Conversion electron yield (CEY) detector, Two-dimensional X-ray detector PILATUS, Electric furnace (1000℃), Cryostat (4 K), Gas supply and detoxifying system, Fourier transform infrared (FT-IR) spectrometer (4000 cm^{-1}～500 cm^{-1}), Bending magnet (3.8-113 keV)</td></tr>
<tr><td rowspan="2">2</td><td>BL02B1 : Single Crystal Structural Analysis</td><td>Charge density study using high energy X-ray, In-situ single crystal experiments, Micro crystal structure analysis</td></tr>
<tr><td colspan="2">Hybrid photon counting detector. (Please contact the beamline scientist, if you submit the beamline proposal for the first time and want to use own experimental devices.) Bending magnet (8-70 keV)</td></tr>
<tr><td rowspan="2">3</td><td>BL02B2 : Powder Diffraction</td><td>Charge density study from powder diffraction, Structural phase transition, <i>Ab initio</i> structure determination from powder diffraction, Crystal structure refinement by Rietveld method, In situ powder diffraction experiment under gas and vapor adsorption/desorption</td></tr>
<tr><td colspan="2">Automatic powder diffraction experiment (50 samples : 90 - 1100 K). Diffractometer for powder diffraction with multiple MYTHEN2 micro-strip x-ray detector and flat panel detector. Please contact to the responsible beamline scientist, if you want to do extremely low-temperature using cryostat (<100 K), high temperature using furnace (<1300 K, Heating stage <1647 K), high-pressure cell (<400 MPa), and In situ powder X-ray diffraction experiment under gas and vapor adsorption/desorption. Bending magnet (12-37 keV)</td></tr>
<tr><td rowspan="2">4</td><td>BL04B1 : High Temperature and High Pressure Research</td><td>X-ray diffraction measurements and radiography under extreme conditions using large-volume press</td></tr>
<tr><td colspan="2">Large-volume press (SPEED-1500, SPEED-Mk.II), AC/DC power supply for electric resistance heating, Energy-dispersive X-ray diffractometer, 2D X-ray CCD detector, High-speed cMOS camera, Ultrasonic velocity measurement system, Bending magnet [white, 20-150 keV; Si(111), 30-60 keV]</td></tr>
<tr><td rowspan="2">5</td><td>BL04B2 : High Energy X-ray Diffraction</td><td>Structural analysis of glass, liquid, and amorphous materials</td></tr>
<tr><td colspan="2">High-throughput PDF measurement system, automatic sample-exchanger (50 samples, 100-1100 K), low/high temperature system with nitrogen gas blowing, X-ray PDF diffractometerfor amorphous materials (Cryostat (20 K-RT), high-temperature furnace (~1,300 K), Aerodynamic levitation system (1,200~3,200 K), currently broken)
Bending magnet [Si(511) 113 keV; Si(220), 61.4 keV]</td></tr>
<tr><td rowspan="2">6</td><td>BL08W : High Energy Inelastic Scattering</td><td>Magnetic Compton scattering, High-resolution Compton scattering, Compton scattering imaging, High-energy X-ray scattering, High-energy X-ray fluorescence analysis (XRF), Time-resolved pair distribution function analysis (PDF)</td></tr>
<tr><td colspan="2">Magnetic Compton scattering spectrometer, High-resolution Compton scattering spectrometer, High-energy X-ray fluorescence spectrometer, Flat area panel detector, Elliptical multipole wiggler (Station A, 110-300 keV; Station B, 100-210 keV)</td></tr>
</table>

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
7	**BL09XU : HAXPES I**	Resonant hard X-ray photoelectron spectroscopy(HAXPES), Polarization-dependent HAXPES using diamond phase retarder, Depth analysis of electron state, Materials science and applied materials science
	・In-vacuum undulator (4.9-100 keV) ・Double channel cut monochromator(DCCM): Si 220 x 2, Si 311 x 2 (hn=4.9-12 keV, Tunable photon energy) / CCM Si 333,444,555 (hn=6,8,10 keV, Fixed energy) ・Double X-ray phase reterdar: Polarization change (hn=5.9-9.5 keV) ・Experimental hutch 1: High-energy-resolution photoelectron spectroscopy by hard X-ray excitation ・Experimental hutch 2: Depth analysis of in-solid and interface electron states ・Spot size: 1.5 μm(V)×20 μm(H) (EH1), 1.5 μm(V)×11 μm(H) / 1.5 μm(V)×1 μm(H)* (EH2) (* Users who wish to use the Φ1 μm focusing and/or mapping of photoelectron should contact the Beamline Scientist before applying for beamtime.) ・Temperature range of sample: ~20-400 K (Liquid He flow is used for cooling)	
8	**BL10XU : High Pressure Research**	Crystal structure analysis under high pressure using diamond-anvil cells, In-situ/operando observation of phase transition and compression behavior under extreme conditions, Material sciences under extreme conditions, High pressure Earth and planetary science
	・Systems for high pressure experiments using diamond anvil cells (<500 GPa) : X-ray flat panel detector (EH2), Imaging plate (EH1), photon-counting pixel detector with CdTe sensor (EH2), Ionization chamber, PIN PD, X-ray focusing lens, Raman spectroscopy system, pressure measurement system for ruby fluorescence method, Cryostat for high pressure experiment (7-300 K), double-sided laser heating system (1,500-6,000 K), Resistive heating system (300-1,000 K), Gas pressure controller for gas membrane DACs (Please contact to BL scientists about using high speed photon-counting detector, and/or Resistive heating system before application.) ・In-vacuum undulator and Si (111)/ Si (220) double crystals: 6-61 keV ・Typical focused X-ray beam size: ~20 μm(H, V) (EH1)、0.8 μm(V)× 0.9 μm(H) / 1.8 μm(V)×2 μm(H) / 7 μm(V)×9 μm(H) (EH2)	

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
9	**BL13XU : X-ray Diffractions and Scattering I**	X-ray diffraction and reflectivity measurements, Atomic-scale structural analysis of crystal surfaces and interfaces, ultrathin films, and nanostructures, Residual stress measurement, Time-resolved X-ray diffraction, In-situ process observation using X-ray diffraction, Operando X-ray diffraction, High-resolution powder X-ray diffraction and X-ray total scattering, Structural refinement using Rietveld analysis, In-situ/operando powder X-ray diffraction, Time-resoluved powder X-ray diffraction, Analysis of local structures using nanodiffraction
	Experimental hutch 1: Versatile Six-axis Diffractometer Experimental hutch 2: Diffraction measurement multi-purpose frame Experimental hutch 3: High-resolution powder X-ray diffraction Experimental hutch 4: Nanobeam X-ray diffraction system Si 111/ 311 double-crystal monochromator Experimental hutch 1: 6-axis X-ray diffractometer (HUBER)/ C-type χ cradle (4 axes for sample, 2 axes for detector), Sample stage (XYZ and swivel), Double slit, Soller slit, Analyzer crystal, Thin film sample heating device (Anton Paar DHS1100, room temperature to 1100℃), Thin film sample heating and cooling device (Anton Paar DCS500, -180 to 500℃) , Small tensile tester (MAX load: 200 N, 2 kN),Various ample atmosphare(Vacuum, N2, He, Al) Scintillation detector (FMB, LaBr3), Ion chamber, 1D detector (6-module of MYTHEN), 2D detector (PILATUS(Si) 300K, 2M) Experimental hutch 2: Sample stage with a hexapod, Robot arm for a detector, 2D detector (PILATUS X 300K, PILATUS X 2M) Experimental hutch 3: Powder Diffractometer equiped with six 2D CdTe photon-counting pixel detectors (Lambda 750 K), Large Area Flat panel detector (XRD1611, 400 x 400 mm^2)、Sample Changer / Automatic measurement system (100 sample, 100 - 1100 K), Large area load table for various operand measurements(θ, XYZ), low- or high-temperature N2 gas streams devices(90 - 473 K, RT - 1100 K), Remote gas handling system for capillary, Please contact to the responsible beamline scientist, if you want to do extremely low-temperature using cryostat (4 - 300 K), high temperature using Anton Paar furnace and Linkam flat plate furnace(~1300 K, ~1700 K), and In situ powder X-ray diffraction Experimental hutch 4: Nanobeam X-ray diffraction system, Fresnel zone plate, X-ray compound refractive lenses, HyPix-3000, Ionization chamber, Pi PIN photodiode, Fluorescence In-vacuum undulator (5 - 72 keV)	
10	**BL14B2 : XAFS II**	X-ray imaging, XAFS in a wide energy range (5-72 keV), XAFS of dilute systems and thin films, Time-resolved XAFS by quick scan (Time-resolved QXAFS), Simultaneous XAFS and XRD measurements
	X-ray imaging camera, XAFS measurement system, Ionization chamber, 19-element Ge solid-state detector (SSD), 7-element SDD, Lytle detector, Conversion electron yield (CEY) detector, Two-dimensional X-ray detector PILATUS, Cryostat (10 K-RT), High-temperature cell for transmission (RT-1,000 ℃), High-temperature cell for fluorescence (RT-800 ℃), High-temperature and pressure cell for transmission (1-9MPa, RT-700 ℃), Gas supply and exhaust system [Users who wish to use the system should contact the Beamline Scientist (Ofuchi) before applying for beamtime.] Bending magnet (5-72 keV)	

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Experimental station/system Light source (energy range at sample position, etc.)		
11	**BL19B2 : X-ray Diffractions and Scattering II**	Residual stress measurement, Structural analysis of thin film, surface and interface, Powder X-ray diffraction, X-ray topography, Ultrasmall-angle X-ray scattering
	Experimental hutch 1: Versatile High-throughput diffractometer (powder diffractometer), low- or high-temperature N2 gas streams devices(100 - 500 K, RT - 1000 K), fully-automated sample changer, triaxis oscillation–rotation sample stage, multi-soller slits. Experimental hutch 2: 6-axis X-ray diffractometer (HUBER)/ C-type χ cradle (4 axes for sample, 2 axes for detector), Sample stage (XYZ and swivel), Double slit, Soller slit, Analyzer crystal, Thin film sample heating device (Anton Paar DHS1100, room temperature to 1100℃), Thin film sample heating and cooling device (Anton Paar DCS500, -180 to 500℃) , Small tensile tester (MAX load: 200 N, 2 kN),Various ample atmosphare(Vacuum, N2, He, Al), Scintillation detector (FMB, LaBr3), Ion chamber, 1D detector (6-module of MYTHEN), 2D detector (PILATUS(Si) 300K). Experomental hutch 3: Small-angle X-ray scattering (SAXS) camera with a camera length of 0.7 - 40 m. fully-automated sample changers, temperature control device (HCS302, Instec Inc., −190 - 400℃). Bending magnet (6-72 keV)	
12	**BL20XU : Medical and Imaging II**	X-ray micro-/nano-imaging: micro-CT, nano-CT (15-37.7 keV), refraction/phase contrast imaging, X-ray diffraction tomography (XRD-CT,DCT), microbeam/scanning x-ray microscope Research and development of X-ray optics and optical elements, coherent X-ray optics Ultra small-angle X-ray scattering (USAXS, 23 keV)
	High-precision diffractometer for various types of imaging, Liquid-nitrogen-cooled Si(111) double-crystal monochromator (7.62-37.7 keV) or Si(220) double-crystal monochromator (~61 keV), Middle-length undulator beamline (245 m), Beam size: 1.4 mm(H) x 0.7 mm(V) at 1st experimental hutch (available up to about 6 mm in diameter by using beam diffuser) and 4 mm(H) x 2 mm(V) at 2nd experimental hutch, High-resolution X-ray imaging detectors (resolution ~1 μm), Large view field X-ray imaging / XRD detectors (maximum FOV 40 mm, resolution 10-20 μm), Imaging intensifier (Be window, 4-inch type), Grove box for preparing samples (dew point about -60 degrees. installed in the downstream hutch outside the storage ring building. Ar atmosphere is available and N2 atmosphere also can be used if necessary. Users who wish to use them should contact the Beamline scientist beforehand at least 2 weeks), Integrated measurement including micro-/nano-CTs, XRD and microbeam is available (prior consultation with beamline scientist required) USAXS (23 keV or 15 keV, 3.6x10^-4 < q < 2.9x10^-3 [1/Å], for smaller q-value than 3.6x10^-4 prior consultation with beamline scientist required)	
13	**BL20B2 : Medical and Imaging II**	X-ray micro-CT/laminography, X-ray phase tomography, X-ray real-time imaging(absorption or refraction contrast), ultra-fast X-ray radiography and X-ray micro-angiography. Small-animal experiments for medical research. Research and development of basic techniques for evaluation of optical devices and X-ray imaging
	High-precision stages for X-ray imaging, General-porpose experimental tables, Long-stroke sample/detector stages, High-resolution X-ray imaging detector (resolution, 1 ~ 10 μm), Wide field of view X-ray imaging detector (100 mm in width), Large-area X-ray imaging detector (flat panel), Medium-length beamline (215 m), Maximum beam size [experimental hutches 2 and 3, 150 mm(H) × 15 mm(V); experimental hutch 1, 30 mm(H) × 4 mm(V)], Bending magnet (Standard crystal monochromator: 8-72 keV, multilayer monochromator: 40 keV, 110 keV)	

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<tr><td colspan="3">Experimental station/system
Light source (energy range at sample position, etc.)</td></tr>
<tr><td rowspan="2">14</td><td>BL25SU : Soft X-ray Spectroscopy of Solid</td><td>Circular polarized soft X-ray beam generated by twin-helical undulator. Research on electronic states by photoemission spectroscopy (PES), Research on electronic band structures by angle-resolved photoemission spectroscopy (ARPES), Study of magnetic states by magnetic circular dichroism (XMCD) of soft X-ray absorption, Analysis of surface atomic arrangement by photoelectron diffraction (PED), Nano-spectroscopic analysis using low-energy/photoemission electron microscope (SPELEEM).</td></tr>
<tr><td colspan="2">A branch: Retarding field analyzer type PED (RFA-PED), Micro-focused soft X-ray PES and ARPES, SPELEEM system
B branch: ±1.9 T Electric-magnet XMCD measurement system
(A branch, 0.12-2 keV; B branch, 0.2-2 keV)
Contact the Beamline Scientist of BL25SU before applying for beamtime for cases (1)-(4) below.
(1) When you use RFA-PED system
(2) When you wish to carry out experiments using carry-in devices
(3) When you plan to use SPELEEM system
(4) When you wish to use associated equipment owned by the beamline</td></tr>
<tr><td rowspan="2">15</td><td>BL27SU : Soft X-ray Photochemistry</td><td>Soft X-ray photoabsorption spectroscopy of dilute samples in partial fluorescence yield mode, Surface and interface analysis using depth-resolved Soft X-ray photoabsorption spectroscopy, Soft X-ray photoabsorption spectroscopy under ambient atmospheric pressure, Spectroscopy using soft X-ray microbeam, Observation of electron state in solids by soft X-ray emission spectroscopy</td></tr>
<tr><td colspan="2">B branch: High-energy soft X-ray beam (2.1-3.3 keV) using Si(111) crystal monochromator
-Soft X-ray photoabsorption spectrometer (electron yield mode and partial fluorescence yield mode)
-X-ray fluorescence analyzer
-Scanning soft X-ray microspectroscopy

C Branch: Low-energy soft X-ray beam (0.17-2.2 keV) using grating monochromator
-Soft X-ray photoabsorption spectrometer (electron yield mode and partial fluorescence yield mode)
-Soft X-ray photoabsorption spectroscopy under ambient atmospheric pressure (Users who wish to use the system should contact the Beamline Scientist (Nitta) before applying for beamtime.)
- Soft X-ray emission spectrometer</td></tr>
<tr><td rowspan="2">16</td><td>BL28B2 : White Beam X-ray Diffraction</td><td>White X-ray diffraction: X-ray topography, Energy-dispersive strain measurement
High energy (~200 keV) X-ray microtomography, Automatic high-energy X-ray micro-CT system
High-speed X-ray imaging</td></tr>
<tr><td colspan="2">White X-ray topography system, Energy-dispersive XAFS system, Experimental system for biomedical application experiments, Multipurpose diffractometer
Bending magnet (White, ≥5 keV)
Beam size: 50 mm(H) x 5 mm(V) @white beam, 50 mm(H) x 1.5 mm(V) @200 keV</td></tr>
</table>

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
17	**BL35XU : Inelastic and Nuclear Resonant Scattering**	Phonons in solids and atomic dynamics in disordered materials by inelastic X-ray scattering. Atomic and molecular dynamics by nuclear resonant inelastic scattering and quasi-elastic scattering. Synchrotron-radiation-based Mössbauer spectroscopy. Nuclear excitation.
	Inelastic X-ray Scattering (IXS) (~1 to 100 nm^{-1}, 12 analyzers) ・ In-vacuum undulator (17.794 and 21.747 keV, Resolution: 3.0 and 1.5 meV) ・Spot size: ~Φ80 μm (Φ20 μm with KB setup) Nuclear Resonant Scattering (NRS): Nuclear inelastic scattering spectrometer, Time-domain/Energy-domain Mössbauer spectrometer, Quasi-elastic scattering spectrometer using time domain interferometry In-vacuum undulator (14.4 - 27.8 keV, 43.0 - 100 keV) ・Spot size: ~50 (H) × 25 (V) μm at 14.4 keV	
18	**BL37XU : Trace Element Analysis**	X-ray microbeam/nano-beam spectrochemical analysis, X-ray spectroscopic imaging, Ultratrace-element analysis, High-energy X-ray fluorescence analysis Projection/scanning/imaging XAFS microscopy, High brightness XAFS, Coherent diffraction imaging XAFS microscopy
	XAFS measurement system, Scanning X-ray microscope, Imaging X-ray microscope, X-ray tomography system, Multipurpose diffractometer, X-ray fluorescence analyzer, Bend crystal Laue analyzer, X-ray shutter, Vacuum chamber Ionization chamber, PIN photodiode, 1-element Ge solid-state detector, 7-element Si drift detector, Indirect conversion X-ray image detector (High speed CMOS camera), Flat-panel detector, 2D pixel array detector In-vacuum undulator, Liquid-nitrogen-cooled double-crystal monochromator (Si(111): 4.5~37.7 keV, Si(511): 12~113 keV), Higher harmonics rejection mirrors (Pt/Ru coated, bent flat mirror for horizontal forcusing) Beam size: 1 mm(H)×0.7 mm(V), 100 nm(H)×100 nm(V) (W.D. = 100 mm, 5~55 keV), 500 nm(H)×300 nm(V) (W.D. = 300 mm, 5~30 keV)	
19	**BL39XU : X-ray Absorption and Emission Spectroscopy**	X-ray magnetic circular dichroism (XMCD) spectroscopy and element-specific magnetometry (ESM), X-ray emission spectroscopy (XES) and its magnetic circular dichroism, XMCD magnetic imaging and local ESM using micro/nanobeam, XAFS microscopy and local ESM, XAFS and XMCD at high pressure, X-ray spectroscopy using variable X-ray polarization (horizontally/perpendicularly linear or circular)
	Diamond circular polarization element (X-ray phase retarder, operable at 4.92-15 keV) XMCD spectrometer + Magnetic field generator [electromagnet (3.5 T@300 K/1.5 T@ Low Temp.), superconducting magnet (7 T, 2 K)](*) X-ray emission spectrometer(incident X-rays: 4.92-28 keV, emission X-rays: 4.4-24 keV)(**) Cryogenic device [helium-flow cryostat (11-330/80-500 K), superconducting magnet (2-300 K), pulse-tube-type cryostat (3-300 K)](*) High-pressure generator (DAC, atmospheric pressure-180 GPa at RT, atmospheric pressure-40 GPa at low temperature)(*) KB focusing mirror for high-pressure XAFS & XMCD (beam size, 1(vertical) x 10(horizontal) μm; W.D.=750 mm; 4.92-30 keV) Wolter focusing mirror for XES (beam size, 1(vertical) x 15(horizontal) μm; W.D.=1300 mm; 4.92-20 keV) KB focusing mirror for microscopic XAFS & XMCD (beam size, 100-300 nm; W.D.= 80 mm; 4.92-16 keV) (*)Users who wish to use these devices should contact the Beamline Scientist before applying for beamtime. (**)Some energy ranges are not available.	

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20	**BL40XU : High Flux**	Time-resolved SAXS/WAXS, XPCS
	SAXS camera (Sampe-to-Detector Distance: 1500, 2200, 4000 or 10000 mm) Pixel array detector (Pilatus3X 100kA (Dectris), Eiger2S 500k (Dectris), Pilatus3S 1M (Dectris), X-ray ImageIntensifier(4 inch, Hamamatsu photonics), CITIUS 840k (RIKEN, only for XPCS) Sample-environment equipments : Temperature Controled Tensile-Test(**10073L, Linkam)、4-syringe stopped-flow mixier(**SFM-4000/S, Biologic)、 In-vacuum standarfd undulator light sources(period length: 28mm) *beamsize (sample position): 250 μm (H) x 40 μm (V), *photon flux 10^14 photons/s (12 keV, quasi monochromatic light), 10^12 photons/s (12 keV, monochromatic light) **Please contact the beamline scientist, if you submit the beamline proposal for the first time and want to use own experimental devices.	
21	**BL40B2 : SAXS BM**	Small-angle X-ray scattering (SAXS)
	Small-angle scattering camera [Vaccum path length, 250, 500, 1000, 1500, 2000, 3000, 4000, 6000(*) mm] Pixel array detector (Pilatus3S 2M, Pilatus100KS and Eiger2 S 500K Dectris Ltd., ModuPIX ADVACAM) Imaging plate ditector (R-AXIS VII(*), Rigaku Corporation) Flat-panel detector (C9728DK-10, Hamamatsu Photonics K.K., for wide angle) Switching mechanism system between SAXS and WAXS (SAXS: 1000, 1500, 2000, 2500, 3000, 3500, 4000 mm for Pilatus2 S 2M; WAXS: 85-170 mm for Eiger2 S 500K) Sample-environment equipment: Temperature control (HCS302 and TS62 Instec Inc., 10002L Linkam Sci., Mechanical characterisation system(*) (10073L Linkam Sci.), DSC(*) (FP84HT, Mettler-Toledo International Inc.), DSC(*) (Rigaku Corporation)), Nitrogen gas generator (maximum flow rate: 5 L/min), Automatic cell cleaning system and sample changer(*) (BioCUBE, Xenocs Inc.), Liquid Chromatograph(HPLC)(*) (Prominence, Shimadzu Corp.) Bending magnet (6.5-22 keV) (*)Users who wish to use these devices should contact the beamline scientist before applying for beamtime.	
22	**BL41XU : Macromolecular Crystallography I**	Macromolecular crystallography, Micro-crystallography,Ultra-high resolution structural analysis
	Diffractometer for macromolecular crystallography In-vacuum undulator (normal mode, 6.5-17.7 keV; *high-energy mode, 19-35 keV) Beam size (at sample position): 5(H) × 5(V) μm^2 ~ 50(H) × 50(V) μm^2 (normal mode), 14(H) × 6(V) μm^2 ~ 300(H) × 300(V) μm^2 (high energy mode) Hybrid photon counting detector EIGER2 XE 16M (normal mode), EIGER2 X CdTe 4M (high-energy mode) Cryo-cooler (N2 gas, ≥100 K; He gas, ≥20 K) Peltier-cooled silicon drift detector SPring-8 precise automatic cryo-sample exchanger (SPACE) *Users who wish to use the high-energy mode should contact the Beamline Scientist before applying for beamtime. Public use of cryogenic transmission electron microscopes, EM01CT, EM02CT, EM03CT and EM04CT, as an ancillary facility. Please check the following Web-site before using the beamline. http://stbio.spring8.or.jp/index_en.php	

No.	**Beamline name**	**Research areas**
Experimental station/system Light source (energy range at sample position, etc.)		
23	**BL43IR : Infrared Materials Science**	Infrared microspectroscopy
	***No call for the 2026A term** Wavenumber range: 100-20,000 cm^{-1} High-spatial-resolution microscope: Objectives (x36(NA=0.5, WD=10 mm), x15(NA=0.4, WD=24 mm), x20(ATR)), Cryostat (4.2 K～400 K), Temperature controlled stage (-190～600℃) Long-working-distance microscope: Objective (x8(NA=0.5, WD=50 mm), Diamond anvil cell+Cryostat (0.4 mm culet/30 GPa, 10～400 K), Cryostat (4.2～400 K) Magneto-optical microscope: Objective (x16(NA=0.3, WD=40 mm), Magnetic field 14 T, Cryostat (4.2～300 K)	
24	**BL45XU : Macromolecular Crystallography II**	Macromolecular crystallography, Micro-crystallography, Automation & High throughput data collection for protein crystallography
	Diffractometer for macromolecular crystallography In-vacuum undulator (6.5-16.0 keV) Beam size (at sample position): 5(H) × 5(V) µm^2 ~ 50(H) × 50(V) µm^2 Hybrid photon counting detector Eiger 16M Cryo-cooler (N2 gas, ≥100 K) SPring-8 precise automatic cryo-sample exchanger (SPACE) Please check the following Web-site before using the beamline. http://stbio.spring8.or.jp/index_en.php	
25	**BL46XU : HAXPES II**	Hard X-ray photoemission spectroscopy Ambient Pressure Hard X-ray Photoemission Spectroscopy
	In-vacuum undulator (5.5-37 keV) Double channel cut monochromator(DCCM): Si 220 x 2, Si 311 x 2 ・Experimental hutch 1: Hard X-ray photoelectron spectroscopy Hard X-ray photoemission spectroscopy system (Scienta Omicron R4000-10kV), hn=6~10 keV, Spot size: 1 µm(V)×30 µm(H) ・Experimental hutch 2: Ambient Pressure Hard X-ray Photoemission Spectroscopy Hard X-ray photoemission spectroscopy system (Scienta Omicron R4000-Hipp2), hn=6~10 keV, Spot size: 1 µm(V)×10 µm(H), Measurement in gas atmosphere* *Please contact to beamline scientists regarding the type of gas and pressure.	

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Experimental station/system		
Light source (energy range at sample position, etc.)		
26	**BL47XU : Micro-CT**	X-ray optics, Planetary science, Materials science, Applied materials science
	In-vacuum undulator (5.2-37.7 keV, horizontal polarization)	
	High-spatial-resolution micro-tomography system, High speed imaging system, Hard X-ray microbeam/scanning microscopy experiment	
	Please contact to beamline scientists before putting on a new proposal to BL47XU.	

■RIKEN Beamlines

No.	Beamline name	Research areas
Experimental station/system		
Light source (energy range at sample position, etc.)		
27	**BL03XU : RIKEN Analytical Science III**	Strucutural analysis by small and wide angle X-ray scattering
	Photon energy: 6~20 keV	
	Photon flux < 1×10^13 photons/s (12.4 keV)	
	Beam size: 30x30～300×300 μm^2、1.2 × 1.6 μm^2	
	Sample-to-detector distance: ~20 cm - 4 m, and 8m	
	For other conditions and facilities, contact the Beamline Scientist beforehand.	
28	**BL05XU : R&D-ID I**	Micro-crystallography
	Photon energy: 13～70 keV	
	Photon flux < 1×10^{13} photons/s (12.4 keV)	
	Beam size: 100×100 μm^2	
	Sample-to-detector distance: 50 ～ 70 mm	
	For other conditions and facilities, contact the Beamline Scientist beforehand.	
29	**BL07LSU : R&D-ID II**	Development of soft X-ray optical system requiring long undulator radiation
	6-segment horizontal and vertical figure-8 undulator, energy range 250~2000 eV (horizontal and vertical polarization)	
	Energy resolution (designed value) E/ΔE>10^4	
	Beam height 1417 mm	
	Beam size > several mm (without refocusing mirror)	
	Flux >10^11 ph/sec/0.01%BW	
	When applying for public use of BL07LSU, it is necessary to have a meeting with the BL representative (RIKEN M.Oura : oura@spring8.or.jp) in advance.	
30	**BL15XU : RIKEN Materials Science III**	Materials science research using an intense 100 keV pink beam
	Experimental station/system: High energy laminography, Large volume deformation press, Portable small deformation press, High pressure PDF diffractometer	
	Light source (photon flux at sample position, etc.): In-vacuum undulator (100 keV, flux of ~6.2×10^13 photons/s)	
	For other conditions and facilities, contact the Beamline Scientist beforehand.	

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
31	**BL16XU : RIKEN Analytical Sciense I**	X-ray diffraction and scattering measurements using Versatile Six-axis Diffractometer
	In-vacuum undulator (undulator period : 40 mm) Liquid-nitrogen-cooled double-crystal monochromator (Si(111) : 5~37 keV) 6-axis X-ray diffractometer (HUBER)/ C-type χ cradle (4 axes for sample, 2 axes for detector), Sample stage (XYZ and swivel), Double slit, Soller slit, Analyzer crystal, Thin film sample heating device (Anton Paar DHS1100, room temperature to 1100℃), Thin film sample heating and cooling device (Anton Paar DCS500, -180 to 500℃) , Small tensile tester (MAX load: 200 N, 2 kN),Various ample atmosphare(Vacuum, N2, He, Al) Scintillation detector (FMB, LaBr3), Ion chamber, 1D detector (6-module of MYTHEN), 2D detector (PILATUS(Si) 300K, 2M)	
32	**BL16B2 : RIKEN Analytical Sciense II**	X-ray topography
	Bending magnet source, standard double-crystal monochromator(Si111 7-37 keV), maximum beam size 50 mm(H)× 5 mm(V) Diffractometer(θ,2θ,φ), sample stage(XYZ), DIFRAS detector1(High-resolution, 0.72 μm/pixel, 10 mm×7.7 mm), DIFRAS detector2(Wide-field, 3.8 μm/pixel, 53 mm×40 mm) For other conditions and facilities, contact the Beamline Scientist beforehand.	
33	**BL17SU : RIKEN Coherent Soft X-ray Spectroscopy**	>Scanning soft x-ray spectromicroscope --- A3 station Microspectroscopic observation of sample surface under conditions ranging from low vacuum to helium atmosphere is available. >Versatile photoemission electron microscope --- Bc station Electronic/magnetic states imaging (resolving power: better than 100 nm) and its time-resolved measurements
	Helical-8 undulator, Energy range for A and B branches (225* - 2,200 eV) (*225 eV for Circularly polarized light, 272 eV for Horizontally polarized light, 136 eV for Vertically polarized light), Energy resolution (E/dE ~10,000), Beam size at sample position [~30 μm(H) × 4 μm(V)] Before applying for public use of BL17SU, contact the following persons in charge of respective equipment. Scanning soft x-ray spectromicroscope: Ina (t.ina@spring8.or.jp) at JASRI, Oura at RIKEN (oura@spring8.or.jp) versatile photoemission electron microscope: Ohkochi (o932t023@guh.u-hyogo.ac.jp) at LASTI/RIKEN/JASRI, Yamagami (kohei.yamagami@spring8.or.jp) at JASRI/RIKEN Free space where users can bring their systems: Oura (oura@spring8.or.jp) at RIKEN	
34	**BL19LXU : RIKEN SR Physics**	Research on physical science requiring ultrahigh-brilliance X-ray beam from long undulator
	Experimental station/system: 5(W) × 3.4(D) × 4.5(H) m^3 open hutch, Optical bench, PIN photodiode, Scintillation counter, Ionization chamber, Stepping motor drivers and controllers, NIM Bin power supply, Counter, Trigger signal synchronized with RF of storage ring Light source (energy range at sample position, etc.): In-vacuum undulator (7.1-18 keV, 22-51 keV, flux of ~1014 photons/s at 12.4 keV) For other conditions and facilities, contact the Beamline Scientist beforehand.	
35	**BL26B1 : RIKEN Structural Genomics I**	Structural biology research based on single-crystal X-ray diffraction
	Area detector [Dectris EIGER X], Goniometer with horizontal spindle axis, Blowing cryo-cooler (95 K-RT), Sample changer SPACE, Bending magnet (6.5-15.5 keV) Please check the following Web-site before using the beamline. http://stbio.spring8.or.jp/index_en.php	

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
36	**BL29XU : RIKEN Coherent X-ray Optics**	Research on physical science using long beamline and coherent X-ray beam
	Experimental station/system: Open hutches with size of 5(W) × 3(D) × 3.3(H) m^3 [EH1], 10(W) × 4.25(D) × 4.5(H) m^3 [EH2], 8(W) × 4(D) × 3.3(H) m^3 [EH3], and 6(W) × 3(D) × 3.3(H) m^3 [EH4], Optical benches, PIN photodiodes, Scintillation counters, Ionization chambers, Stepping motor drivers and controllers, NIM Bin, Power supply, Counter, Visible-conversion X-ray camera, Trigger signal synchronized with RF of storage ring Light source (energy range at sample position, etc.): In-vacuum undulator (1st order harmonics : 6.5-21.4 keV, 3rd order harmonics : 19.5-64.2 keV, flux of ~5 × 10^{13} photons/s at 10 keV), silicon monochromator(111 plane)(4.4 ~ 37.8 keV) For other conditions and facilities, contact the Beamline Scientist beforehand.	
37	**BL32B2 : R&D-BM**	Development of measurement technique using synchrotron radiation from bending magnets
	Experimental station/system: 5.0(W) × 3.0(D) × 3.3(H) m^3 open hutch, Optical bench, PIN photodiode, Ionization chamber, Stepping motor drivers and controllers, NIM Bin power supply, Counter Light source (energy range at sample position, etc.): Bending magnet (Standard double crystal monochromator : 5-72 keV) For other conditions and facilities, contact the Beamline Scientist beforehand. Before applying for public use, it is necessary to have a meeting with the BL representative.	
38	**BL32XU : RIKEN Targeted Proteins**	Structural biology, X-ray crystallography for biopolymer, Micro-crystallography for ultrafine proteins
	Experimental station/system: EEM focusing mirror unit, Ultralow-eccentricity high-precision goniometer, Ultralow-temperature He blower, Hybrid photon counting detector (DECTRIS EIGER X 9M), Large-volume sample mounting robot with applicability to Hampton pins Light source (energy range at sample position, etc.): [Light source] Hybrid undulator [Beam size at sample position] 1×1-10×10 μm^2 [Flux of 1 μm beam] 7 × 10^{10} photons/s at 12.4 keV [Energy range] 9-18 keV (If you prefer to use lower energy X-ray than 9 keV, please contact us) Please check the following Web-site before using the beamline. http://stbio.spring8.or.jp/index_en.php	
39	**BL36XU : RIKEN Materials ScienceII**	Time-resolved QXAFS using tapered-Undulator beam
	[Energy region] 4.5-35 keV, [beam size] 40 μm(V)×500 μm(H), 100 nm(V)×100 nm(H), [time resolution] QXAFS(20 ms). [light source and optics] In-vacuum tapered undulator, channel-cut crystal monochromators (Si(111), Si(220)), Rh/Pt coated vertical/horizontal focusing mirrors, Rh/Pt coated KB mirrors(4.5-35 keV). [Measurement system] Transmission XAFS measurement system, 4-element SDD, PILATUS 300KW, 4-element Merlin detector, indirect X-ray image detector In BL36XU, only Quick XAFS apparatus is open for public use. When you apply for public use of BL36XU, please contact to the beamline staff beforehand.	
40	**BL38B1 : RIKEN Structural Biology I**	Small Angle X-ray Scattering
	Bending Magnet(6.5～15.5 keV) ＊User opereation is only 12.4 keV or 15.5 keV. Camera length; 300, 2500 mm Detector; DECTRIS PILATUS3X 2M., HPLS system for SEC-SAXS *Use only BioSAXS.	

No.	Beamline name	Research areas
Experimental station/system Light source (energy range at sample position, etc.)		
41	**BL43LXU : RIKEN Quantum NanoDynamics**	meV Scale IXS for atomic dyanmics
	Energy: 14.4-26 keV (Fundamental), meV Spectrometer for atomic dynamics	
42	**BL44B2 : RIKEN Materials Science I**	Structural analysis of periodic and aperiodic systems by total scattering
	Wavelength: 0.41～0.8 Å Instrument: Two-axis powder diffractometer (2θ range: 0.5～153°, 2θ step: 0.01°) Temperature: -180～800℃	