

## **BEAMLINES**

The beamlines at the SPring-8 Facility are categorized into four groups as listed below:

- (1) Public Beamlines,
- (2) Contract Beamlines,
- (3) JAERI / RIKEN Beamlines,
- (4) Accelerator Beam Diagnosis Beamlines.

The public beamlines are constructed with the support of the national budget, and are open for public use. This category of public beamlines includes the R&D beamlines, which were constructed for the purpose of developing new devices and beamline equipment such as optical elements, detection systems, and so forth. Used mainly by SPring-8 staff, the R&D beamlines are also open to public. Now 25 public beamlines are operational and available for public use.

The contract beamlines are, on the other hand, facilities that are installed, owned, operated and maintained by universities, companies and other organizations. Beamline contractors can use their beamline almost exclusively. Hyogo Prefecture took the lead in the contract beamline construction. The Industrial Consortium, Institute for Protein Research (Osaka Univ.), the Research Center for Nuclear Physics (RCNP, Osaka Univ.) and National Institute for Materials Science followed in that



★ : Public Beamlines	BL	Beamline	IR	Infrared Radiation
<ul> <li>Contract Beamlines</li> </ul>	B1, B2	Bending Magnets	LEP	Laser-Electron Photon
: JAERI or RIKEN Beamlines	XU	X-ray Undulator	LXU	Long-length Undulator
: Accelerator beam diagnostic line	SU	Soft X-ray Undulator	SS	Straight Section
	W	Wiggler		
$ \odot \diamond \Box$ : Planned or Under construction				

Fig. 2. Beamline Map.

36

order, after which the first foreign contract beamlines (BL12B2 and BL12XU) were constructed by the Asia and Pacific Council for Science and Technology of Taiwan (APCST). BL32B2, constructed by the industrial consortium that is made up of 22 pharmaceutical companies, recently joined SPring-8 contract beamlines and became operational in May 2002. Currently those nine contract beamlines are all in operation.

The JAERI/RIKEN beamlines are those constructed by JAERI and RIKEN to promote their own research activities. Nine JAERI/ **RIKEN** beamlines have already been constructed and other two are in commissioning or under construction by RIKEN for the exclusive use of RIKEN scientists, although 20% of beam time is reserved for public use. Experimental stations of BL22XU and BL23SU are located at RI Laboratory and dedicated to research utilizing radioactive isotopes and actinide materials. BL26B1 and BL26B2 are beamlines that will be used for high throughput protein crystallography following the human genome project. BL29XU has two experimental stations, one located at the experimental

<b>Public Beam</b>	nlines (25	)	
BL #	Source	Beamline Name	Status
BL01B1	BM	XAFS	in operation
BL02B1	BM	Single Crystal Structure Analysis	in operation
BL02B2	BM	Powder Diffraction	in operation
BL04B1	BM	High Temperature and High Pressure Research	in operation
BL04B2	BM	High Energy X-ray Diffraction	in operation
BL08W	W	High Energy Inelastic Scattering	in operation
BL09XU	U	Nuclear Resonant Scattering	in operation
BL10XU	U	High Pressure Research	in operation
BL13XU	U	Surface and Interface Structures	in operation
BL19B2	BM	Engineering Science Research	in operation
BL20XU	U	Medical and Imaging II	in operation
BL20B2	BM	Medical and Imaging I	in operation
BL25SU	U	Soft X-ray Spectroscopy of Solid	in operation
BL27SU	U	Soft X-ray Photochemistry	in operation
BL28B2	BM	White Beam X-ray Diffraction	in operation
BL35XU	U	High Resolution Inelastic Scattering	in operation
BL3/XU	U	Trace Element Analysis	in operation
BL38B1	BM	R&D (3)	in operation
BL39XU	U	Magnetic Materials	in operation
BL40XU	U	High Flux	in operation
BL40B2	BM	Structural Biology II	in operation
BL41XU	U	Structural Biology I	in operation
BL43IR	BM	Infrared Materials Science	in operation
BL46XU	U	R&D (2)	in operation
BL4/AU	U	K&D (1)	in operation
<b>Contract Be</b>	amlines (	9)	
BL #	Source	Beamline Name	Status
BL12XU	U	APCST ID (APCST)	in operation
BL12B2	BM	APCST BM (APCST)	in operation
	<b>T</b> T	WEBRAM (National Institute for Materials Science)	in operation
BL15XU	U		
BL15XU BL16XU	U	Industrial Consortium ID (Industrial Consortium)	in operation
BL15XU BL16XU BL16B2	U U BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium)	in operation in operation
BL15XU BL16XU BL16B2 BL24XU	U U BM U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture)	in operation in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2	U BM U BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium)	in operation in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP	U BM U BM BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University)	in operation in operation in operation in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU	U BM U BM BM U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University)	in operation in operation in operation in operation in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK	U BM U BM BM U EN Bean	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) hlines (11)	in operation in operation in operation in operation in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL #	U BM U BM BM U EN Bean Source	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) hlines (11) Beamline Name	in operation in operation in operation in operation in operation status
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL# BL11XU	U BM U BM BM U EN Bean Source U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) alines (11) Beamline Name JAERI Materials Science II (JAERI)	in operation in operation in operation in operation in operation <b>Status</b> in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL33B2           BL33LEP           BL44XU           JAERI/RIK           BL11XU           BL14B1	U BM U BM BM U EN Bean Source U BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) nlines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI)	in operation in operation in operation in operation in operation in operation <b>Status</b> in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL# BL11XU BL14B1 BL22XU	U BM U BM BM U EN Bean Source U BM U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) nlines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science II (JAERI) JAERI Actinide Science II (JAERI)	in operation in operation in operation in operation in operation <b>Status</b> in operation in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL11XU           BL14B1           BL22XU           BL23SU	U BM BM BM U EN Bean Source U BM U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) nlines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI)	in operation in operation in operation in operation in operation <b>Status</b> in operation in operation in operation in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL #           BL11XU           BL22XU           BL23SU           BL17SU	U U BM BM BM U V EN Bean Source U BM U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Actinide Science II (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN)	in operation in operation in operation in operation in operation in operation Status in operation in operation in operation in operation under construction
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL14B1           BL23SU           BL17SU           BL19LXU	U U BM U BM U EN Bean Source U BM U U U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN SR Physics (RIKEN)	in operation in operation in operation in operation in operation in operation Status in operation in operation in operation under construction in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL14B1           BL22XU           BL23SU           BL17SU           BL19LXU           BL26B1	U U BM U BM U EN Bean Source U BM U U U U U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN SR Physics (RIKEN) RIKEN Structural Genomics I (RIKEN)	in operation in operation in operation in operation in operation in operation Status in operation in operation in operation in operation under construction in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL14B1           BL22XU           BL17SU           BL17SU           BL26B1           BL26B2	U U BM U BM U EN Bean Source U BM U U U U U U U U U BM BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics II (RIKEN)	in operation in operation in operation in operation in operation in operation Status in operation in operation in operation in operation under construction in operation in operation in operation in operation in operation in operation in operation in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL4HXU BL14B1 BL14B1 BL22XU BL19LXU BL19LXU BL26B1 BL26B2 BL29XU	U U BM BM U EN Bean Source U BM U U U U U U U U U U U U U U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics II (RIKEN) RIKEN Coherent X-ray Optics (RIKEN)	in operation in operation in operation in operation in operation in operation <b>Status</b> in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL14B1           BL23SU           BL17SU           BL19LXU           BL26B1           BL26B2           BL29XU           BL44B2	U U BM U BM U EN Bean Source U BM U U U U U U U U U U U BM BM U U BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) nlines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics II (RIKEN) RIKEN Structural Biology II (RIKEN)	in operation in operation in operation in operation in operation in operation <b>Status</b> in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL23SU           BL17SU           BL19LXU           BL26B1           BL26B2           BL29XU           BL44B2           BL45XU	U U BM U BM U EN Bean Source U BM U U U U U U U U U U U U U U U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN SR Physics (RIKEN) RIKEN SR Physics (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Biology II (RIKEN) RIKEN Structural Biology I (RIKEN)	in operation in operation in operation in operation in operation in operation <b>Status</b> in operation in operation in operation in operation under construction in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL33B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL23SU           BL17SU           BL26B1           BL26B1           BL26B2           BL29XU           BL44B2           BL45XU	U U BM BM U EN Bean Source U BM U U U U U U U U U U U U BM BM U BM U U BM	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Idines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Biology I (RIKEN) RIKEN Structural Biology I (RIKEN) agnosis Beamline (2)	in operation in operation in operation in operation in operation in operation <b>Status</b> in operation in operation
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL # BL11XU BL14B1 BL22XU BL17SU BL19LXU BL26B1 BL26B1 BL26B2 BL29XU BL44B2 BL45XU Accelerator BL #	U U BM BM U BM Source U BM U U U U U U U U U U U U U U BM BM U BM U Source	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Idines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics II (RIKEN) RIKEN Structural Biology II (RIKEN) RIKEN Structural Biology I (RIKEN) RIKEN Structural Biology I (RIKEN) Beamline Name	in operation in operation in operation in operation in operation in operation Status in operation in operation status
BL15XU BL16XU BL16B2 BL24XU BL32B2 BL33LEP BL44XU JAERI/RIK BL # BL11XU BL14B1 BL22XU BL17SU BL19LXU BL26B1 BL26B1 BL26B1 BL26B1 BL26B1 BL4B2 BL44B2 BL45XU Accelerator BL # BL05SS	U BM BM U BM EN Bean Source U BM U U U U U U U U U U U U U U U U U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) IAERI Actinide Science I (JAERI) RIKEN Coherent Soft X-ray Spectroscopy (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Biology II (RIKEN) RIKEN Structural Biology II (RIKEN) RIKEN Structural Biology I (RIKEN) RIKEN Structural Biology I (RIKEN) Accelerator Beam Diaenosis	in operation in operation in operation in operation in operation in operation Status in operation in operation
BL15XU           BL16XU           BL16B2           BL24XU           BL32B2           BL33LEP           BL44XU           JAERI/RIK           BL           BL11XU           BL44XU           BL23SU           BL14B1           BL22XU           BL17SU           BL19LXU           BL26B1           BL26B2           BL29XU           BL44B2           BL45XU           Accelerator           BL           BL05SS           BL38B2	U U BM BM U BM Source U BM U U U U U U U U U U BM BM U BM U	Industrial Consortium ID (Industrial Consortium) Industrial Consortium BM (Industrial Consortium) Hyogo (Hyogo Prefecture) Pharmaceutical Industry (Pharmaceutical Consortium) Laser-Electron Photon (Osaka University) Macromolecular Assemblies (Osaka University) Ilines (11) Beamline Name JAERI Materials Science II (JAERI) JAERI Materials Science I (JAERI) JAERI Materials Science I (JAERI) JAERI Actinide Science I (JAERI) JAERI Actinide Science I (JAERI) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Genomics I (RIKEN) RIKEN Structural Biology II (RIKEN) RIKEN Structural Biology I (RIKEN)	in operation in operation in operation in operation in operation in operation Status in operation in operation

Table II. SPring-8 beamlines.

hall, and the other at the end of the 1 km. Dedicated to studying the characteristics of the electron beam accumulated in the storage ring, the accelerator beam diagnosis beamlines are currently under the exclusive use of the JASRI accelerator group. As of May 7, 2003, one beamline is currently in the phase of commissioning (BL26B2) and two beamlines (BL17SU, BL05SS) are under construction.

All beamlines are shown in the Beamline Map (Fig. 2). Including the two accelerator beam diagnosis beamlines, we have beamlines, *i.e.*, about 75% of 62 beamlines that SPring-8 can accommodate.