in Taiwan. Currently those eight contract beamlines are all in operation. The ninth contract beamline by the Pharmaceutical Consortium for Protein Structure Analysis is now under construction. The JAERI/RIKEN beamlines are those constructed by JAERI and RIKEN to promote their own research activities. 11 beamlines have been constructed or are under construction by JAERI and RIKEN for the exclusive use of JAERI and RIKEN scientists. BL19LXU, one of RIKEN beamlines, is an ID beamline with a long undulator at a 30 m-long straight section and was installed while rearranging the magnets in the storage ring during the summer shutdown of 2000. 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 hall, and the other at the end of the 1 km beamline.

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 October 2001, two beamlines are currently in the phase of commissioning (BL12XU, BL19LXU, BL22XU) and six beamlines (BL17SU, BL26B1, BL26B2, BL32B2, BL37XU) are under construction.

All beamlines are shown in the Beamline Map (Fig. 2). Including the two accelerator beam diagnosis beamlines, we have 47 beamlines, *i.e.*, about 75% of 62 beamlines that SPring-8 can accommodate.

User Operation

Each year SPring-8 holds two calls for proposals to use its public beamlines. Beam time is then allocated to selected applicants for the forthcoming SPring-8 research term. The first such term (1997B) ran from October 1997 (when the facility opened) until the end of Japan's financial year, March 1998. The second research term (1998A) ran from April 1998 until October 1998. After a somewhat longer third research term (1999A) from November 1998 until June 1999, SPring-8 roughly divided the year's user beam time into two terms with the summer shutdown in between. The proposal submission deadlines for the sixth and seventh research terms (2000B and 2001A) were October 21, 2000 and May 26, 2001, respectively. SPring-8 Proposal Review Committee approved 380 out of the 582 proposals submitted for 2000B and 409 out of 502 for 2001A. The numbers of selected proposals for proprietary research were 12 in 2000B, and 8 in 2001A, respectively. And the percentage of selected proposals from overseas was 5% for both terms. SPring-8 operational results for the period from 1997B to 2001A are shown in Table 2. This table shows each user beam time allocated and the number of users and experiments conducted, which are illustrated in Fig. 3. For reference, the relevant data of contract beamlines is also indicated. In 2001A, SPring-8 provided users with 2,381 hours of beam time in five operation cycles. 2,915 individuals used the facility's public beamlines in 473 separate experiments. Between October 1997, opening of SPring-8 for research, and the end of 2001A, a total of 15,951 public and contract beamline users conducted 2,462 experiments.

Research Term	User Time (hours)	Public BL		Contract BL	
		Experiments	Users	Experiments	Users
1997B: 1997.10 - 1998.03	1,286	94	681		
1998A: 1998.04 - 1998.10	1,702	234	1,252	7	
1999A: 1998.11 - 1999.06	2,585	274	1,542	33	467
1999B: 1999.09 - 1999.12	1,371	242	1,631	65	427
2000A: 2000.01 - 2000.06	2,106	365	2,486	102	794
2000B: 2000.10 - 2001.01	1,558	382	2,370	88	620
2001A: 2001.02 - 2001.06	2,381	473	2,915	103	766
TOTAL	12,989	2,064	12,877	398	3,074

Table 2. SPring-8 operational results.

Public Beamlines (25)

BL #	Source	Beamline Name	Status
BL01B1	BM	XAFS	in operation
BL02B1	BM	Crystal Structure Analysis	in operation
BL02B2	BM	Powder Diffraction	in operation
BL04B1	BM	High Pressure and High Temperature	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	Extremely Dense State 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
BL37XU	U	Trace Element Analysis	under construction
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
BL47XU	U	R&D (1)	in operation

Contract Beamlines (9)

BL #	Source	Beamline Name	Status
BL12XU	U	APCST ID (APCST)	in commissioning
BL12B2	BM	APCST BM (APCST)	in operation
BL15XU	U	WEBRAM (National Institute for Materials Science)	in operation
BL16XU	U	Industrial Consortium ID (Industrial Consortium)	in operation
BL16B2	BM	Industrial Consortium BM (Industrial Consortium)	in operation
BL24XU	U	Hyogo (Hyogo Prefecture)	in operation
BL32B2	BM	Pharmaceutical Consortium (Pharmaceutical Consortium)	under construction
BL33LEP	BM	Laser-Electron Photon (Osaka University)	in operation
BL44XU	U	Macromolecular Assemblies (Osaka University)	in operation

JAERI/RIKEN Beamlines (11)

BL #	Source	Beamline Name	Status
BL11XU	U	JAERI Materials Science II (JAERI)	in operation
BL14B1	BM	JAERI Materials Science I (JAERI)	in operation
BL22XU	U	JAERI Actinide Science II (JAERI)	under construction
BL23SU	U	JAERI Actinide Science I (JAERI)	in operation
BL17SU	U	RIKEN Coherent Soft X-ray Spectroscopy (RIKEN)	under construction
BL19LXU	U	RIKEN SR Physics (RIKEN)	in commissioning
BL26B1	BM	RIKEN Structural Genomics I (RIKEN)	under construction
BL26B2	BM	RIKEN Structural Genomics II (RIKEN)	in commissioning
BL29XU	U	RIKEN Coherent X-ray Optics (RIKEN)	in operation
BL44B2	BM	RIKEN Structural Biology II (RIKEN)	in operation
BL45XU	U	RIKEN Structural Biology I (RIKEN)	in operation

Accelerator Beam Diagnosis Beamline (2)

BL #	Source	Beamline Name	Status
BL05IN	U	Accelerator Beam Diagnosis	under construction
BL38B2	BM	Accelerator Beam Diagnosis	in operation

Table 1. SPring-8 beamlines.

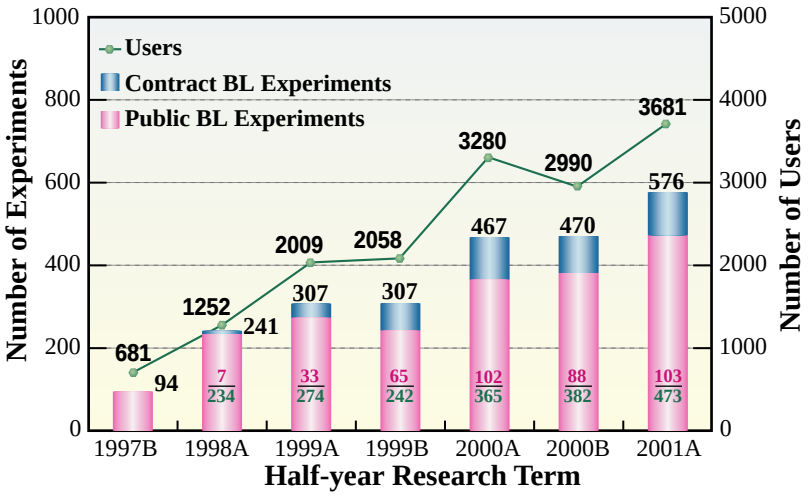

Fig. 3. Number of users and experiments conducted.

Figures 4 and 5 indicate the transition of the number of selected proposals by the affiliation of applicants and by the research fields from 1997B to 2001A. As can be seen from the charts, the trend for each year has been almost the same during the period. In other words, as for the classification by the affiliations, universities have accounted for close to 70% and other organizations have made up the rest almost equally. The same trend applies to the classification by the research fields. The ratio of life science, diffraction & scattering and others has been 1:1:1 throughout the same period. The ratio of XAFS, spectroscopy and method & instrumentation, all of which are categorized as "others," has also been 1:1:1. The ratio remained the same except for the first research term (1997B).

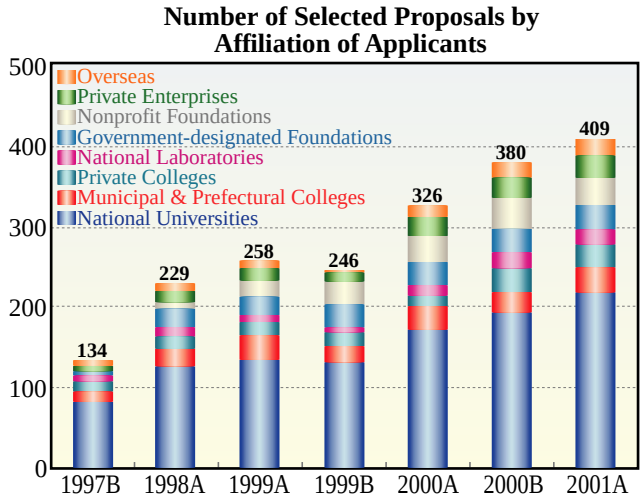

Figure 4

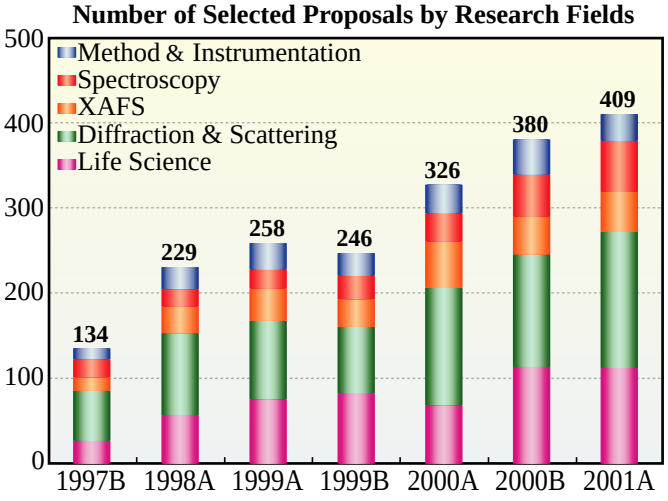

Figure 5

Proprietary Research

For proprietary research, users can keep their results by paying beam time fees. This system is useful when there is some confidential information for commercial purposes in experiments and samples and the users do not want to disclose the results. Since the start of the system in the fourth half-year research term (1999B), 18 experiments have been carried out as proprietary research.

Long-term Use of Beamlines

Apart from the regular public use, SPring-8 has created a system for the long-term use of beamlines where users can secure beam time for a longer period of time. While the regular beam time is valid for six months, the beam time for this long-term use is valid for up to three years. This system aims to further promote research that will produce outstanding results in the field of science and technology, that will pave the way for new research areas and research methodology and that will help improve the technology for industrial base significantly by getting the most of the characteristics of SPring-8.

Industrial Research

Together with the promotion of research activities in the field of basic science, contributing to the reinforcement of the technological basis in industry has been one of the major aims of the SPring-8 project. Since its foundation in 1990, JASRI has sought possible ways of industrial applications of SR science.

The framework of the contract beamlines is to facilitate the construction of beamlines by industries at the SPring-8 Facility. Hyogo Prefecture constructed a contact beamline (BL24XU), and has been conducting experiments on protein crystal analysis, surface/interface analysis of inorganic materials, X-ray micro-beam analysis, and X-ray imaging since May 1998. There have been two beamlines (BL16XU and BL16B2) constructed by the industrial consortium that is composed of thirteen companies in the fields of electronics, steel, electric power and automobiles. Since October 1999, the consortium has been carrying out its experiments on X-ray diffraction, X-ray fluorescence analysis, and X-ray micro-beam experiments at the BL16XU, and XAFS and X-ray topography at the BL16B2. Another contract beamline, BL32B2, constructed by the industrial consortium that is made up of 22 pharmaceutical companies is now in commissioning phase and is expected to be ready by the summer of 2002 for experiments and research on protein structure analysis for drug design. In addition, a new beamline for the industrial applications of SR science has been added to the lineup of public beamlines, which is a bending magnet beamline (BL19B2) for experiments on XAFS, multipurpose X-ray diffractometry, and X-ray fluorescence spectroscopy. Its construction will be completed sometime in fall 2001.

Research Results

When using SPring-8 for non-proprietary research, users are exempted from beam time fees if they submit an Experiment Report within 60 days after their experiment. JASRI expects that users will disclose their research results obtained through non-proprietary research in scientific journals. In cases where the results are disclosed, uses must report to JASRI and have them registered with JASRI.

The number of research results produced by public and contract beamline users and JASRI staff is 1,003 as of August 2001.