

# Proposal Schemes, Utilization Statistics and Research Outcome

## Overview

JASRI invites General Proposals twice a year. Submitted proposals are reviewed by the SPring-8 Proposal Review Committee (PRC). In the General Proposal scheme, the PRC approved 357 of 591 proposals in 2005B and 522 of 696 in 2006A. In the Priority Field Proposal scheme, 267 proposals were adopted from 382 in 2005B and 93 were adopted from 136 in 2006A. In total, 4,020 hours of beamtime was allocated to users from 2005B through 2006A.

SPring-8 user operation statistics for the period from 1997B to 2006A are shown in Table III. This table summarizes the beamtime available to users, the number of users and the number of experiments conducted at both public and contract beamlines, which are also illustrated in Fig. 3. The number of experiments conducted in the reserved beamtime at RIKEN beamlines and the number of Priority Research Proposals are included in the number of Public BL experiments in the table and figure.

In 2005B and 2006A, SPring-8 provided users with 1,818 and 2,202 hours of beamtime in three and four operation cycles, respectively. As for 2005B, 4,032 individuals utilized the public beamlines in 619 independent experiments, while 1,379 individuals utilized the contract beamlines in 227 experiments. In 2006A, 4,809 individuals utilized the public beamlines in 722 independent experiments, while 1,831 individuals utilized the contract beamlines in 227 experiments. From October 1997, when SPring-8 was opened to the public, through 2006A, a total of 65,566 users conducted 9,780 experiments at public and contract beamlines.

Table III. SPring-8 user operation results.

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: 2000.02 - 2000.06	2,051	365	2,486	100	794
2000B: 2000.10 - 2001.01	1,522	382	2,370	88	620
2001A: 2001.02 - 2001.06	2,313	473	2,915	102	766
2001B: 2001.09 - 2002.02	1,867	486	3,277	114	977
2002A: 2002.02 - 2002.07	2,093	543	3,246	110	1,043
2002B: 2002.09 - 2003.02	1,867	538	3,508	142	1,046
2003A :2003.02 - 2003.07	2,246	632	3,777	164	1,347
2003B: 2003.09 - 2004.02	1,844	548	3,428	154	1,264
2004A: 2004.02 - 2004.07	2,095	568	3,756	161	1,269
2004B: 2004.09 - 2004.12	1,971	554	3,546	146	1,154
2005A: 2005.04 - 2005.08	1,880	560	3,741	146	1,185
2005B: 2005.09 - 2005.12	1,818	619	4,032	187	1,379
2006A: 2006.03 - 2006.07	2,202	722	4,809	227	1,831
<b>TOTAL</b>	<b>32,713</b>	<b>7,834</b>	<b>49,997</b>	<b>1,946</b>	<b>15,569</b>

Figures 4 and 5 indicate the number of conducted experiments along with the affiliated number of users and the research fields from 1997B to 2006A. In Fig. 5, three types of research, namely, those performed under Advanced Large-Scale Research Facilities Strategic Program, Power User Proposal, Strategy Proposal, which have their own original peer review system, are separated from the other general research fields.

The percentages of experiments conducted by foreign users were 4.5% for 2005B and 4.8% for 2006A. The number ratios of Life Science to

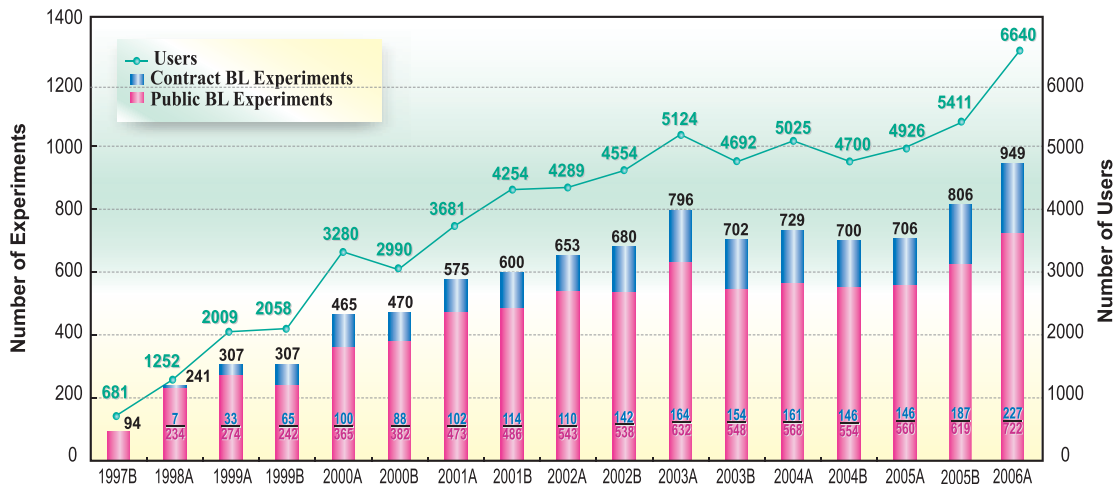


Fig. 3. Numbers of users and experiments conducted.

Diffraction & Scattering to other experiments has approximately been 1:1:1 since the inauguration of SPring-8. The number ratios of XAFS to Spectroscopy to Method & Instrumentation

experiments, all of which are categorized as “others,” has also approximately been 1:1:1. Recently, however, the number ratio of Diffraction & Scattering to Industry has increased.

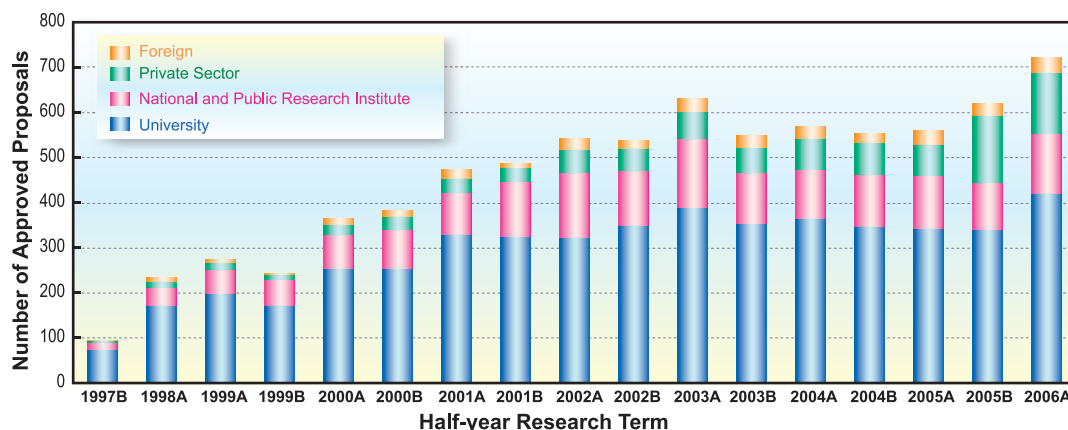


Fig. 4. Number of conducted proposals by affiliation of applicants (public beamlines).

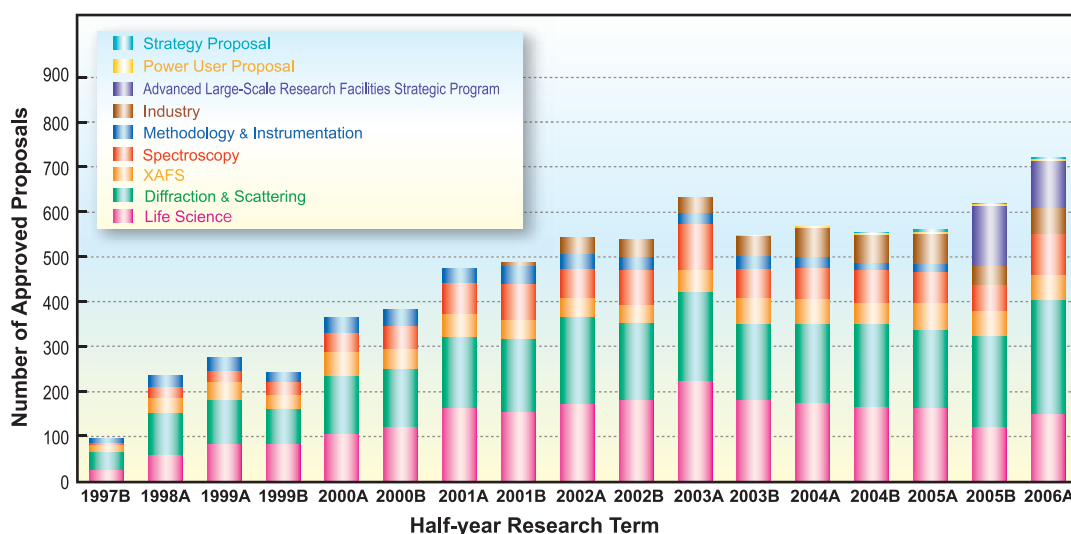


Fig. 5. Number of selected proposals by affiliation of applicants (public beamlines).

## Long-term Proposal

Independent of the General Proposals, JASRI has developed a novel scheme for the long-term use of beamlines, in which beam access is guaranteed for up to three years. This system aims to further promote research that is expected to produce outstanding results in the field of science and technology to pave the way for new research areas and research methodologies and to significantly help improve the technology for the industrial base by making the best use of the characteristics of SPring-8. Three proposals were selected from 6 submitted in 2005B

and 1 was submitted and selected in 2006A. Seven proposals were carried out by the end of 2006A.

## Urgent Proposal

In 1999A, an Urgent Proposal scheme was established in order to adequately respond to urgent requests for conducting experiments as soon as possible. Upon receiving an Urgent Proposal of non-proprietary use, the Proposal Review Committee promptly reviews it electronically in terms of its necessity and urgency as well as on the basis of the criteria for General Proposals of non-proprietary use.

## Proprietary Research Proposal

Users can conduct proprietary research by paying the beamtime fee, which was repriced from 472,000 yen/shift to 480,000 yen/shift in 2006B. Proprietary research is essential when users have commercially confidential information in their experiment or samples and do not wish to disclose their research results. In 2005B, 32 proprietary experiments were performed at public beamlines and 24 were performed at contract beamlines (21 at BL32B2, 1 at BL24XU, and 2 at BL16XU). In 2006A, 24 experiments were conducted at public beamlines and 25 experiments were conducted at contract beamlines (22 at BL32B2, 2 at BL24XU, and 1 at BL16B2). From 1999B, when the system was introduced, to 2006A, a total of 422 proprietary experiments were carried out at both public and contract beamlines. The Pharmaceutical Consortium spent most of their beamtime on proprietary research at their contract beamline BL32B2 in 2005B and 2006A.

## Proprietary Time-designated Proposal

In 1999B, JASRI established a utilization scheme for those who wish to take sole possession of their results and perform experiments during a specific time period by paying a beamtime fee with an increase in price of 50% compared with that charged for public beamlines as premium, which was revised from 708,000 yen/shift to 720,000 yen/shift in 2006B. In this utilization scheme, users can specify the preferred time period in their Proprietary Time-designated Proposal, which will be promptly reviewed once submitted.

## Priority Research Proposal

In FY2003, a new scheme for the management of public beamlines was established on the basis of a report on SPring-8 by the governmental review committee. The report called for SPring-8 to further promote the use of public beamlines to produce more research results. The most important point of the scheme was its launching of the Priority Research Program. The new scheme is shown in Fig. 6. As can be seen from the figure, beamtime not exceeding 50% is allocated to Priority Research Proposals and proposals using beamtime reserved for JASRI; thus, more than 50% of the total user beamtime is guaranteed for General and Long-term proposals. The Priority Research Program scheme is intended to make the best use of SPring-8 and to produce more research results. Priority Research Proposals are tentatively categorized into the following three groups.

- Priority Field Proposal
- Power User Proposal
- Strategy Proposal

## Priority Field Proposal

In this particular proposal scheme, JASRI strategically designates research fields in order to promote excellent research results from those areas in scientific and/or industrial domains with high strategic significance. The Priority Field Proposals are further categorized into four subgroups: Nanotechnology Support, Protein 500, Industrial Use and Medical bio trial use. These proposals are reviewed before General Proposals at the review committees designated for each priority field. The outline of each priority research field is as follows.

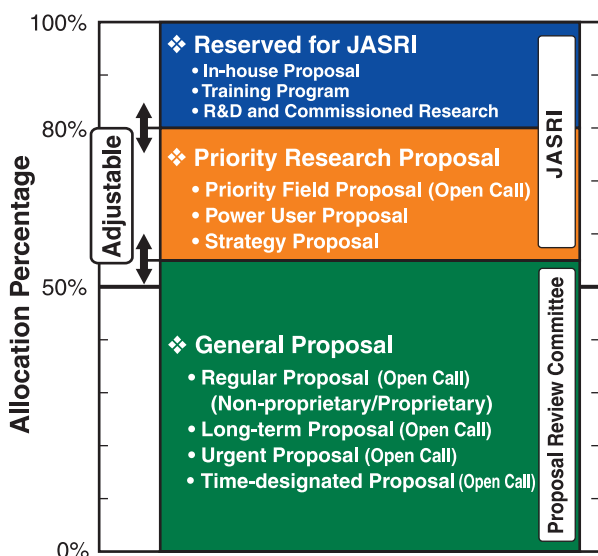


Fig. 6. Beamtime allocation scheme for public beamlines.

## Nanotechnology Support

This priority research field was developed to support developments in nanotechnology, using 12 beamlines at SPring-8. Nanotechnology Support at SPring-8 had already started in 2002 under the Nanotechnology Researchers Network Project (Nanonet Project) of MEXT, and was consolidated into the Priority Research Program in FY2003. In 2005B and 2006A, a total of 106 proposals were selected from 211 submitted proposals. This Project will be in effect until the end of FY2006.

## Protein 500

Just as Nanotechnology Support, Protein 500 at SPring-8 started shortly after MEXT launched the Protein 3000 Project in 2002 as a post-human genome program to analyze the structure of 3,000 proteins and was taken over by the Priority Field Program in FY2003. Under the Project, three of the

SPRING-8 structural biology beamlines are assigned to analyze 500 kinds of protein structure, and 30% of their beamtime is allocated every year. In 2005B and 2006A, a total of 194 proposals were selected. This Project will be in effect until the end of FY2006.

## Industrial Use

In relation to industrial use, the Trial Use Program originally ran from 2001B to 2002A for the purpose of attracting new users to SPRING-8 mainly from industries, and was restarted as one of the Priority Field Proposals in 2003A. In 2005B, 4 from 6 proposals were selected and the Trial Use program for industrial use was successfully completed. In the same period, the Advanced Large-Scale Research Facilities Strategic Utilization Program, which is mainly focused on enhancing industrial use, was launched as a national project. There were 194 and 148 proposals submitted, of which 134 and 103 were approved to be conducted in 2005B and 2006A, respectively.

## Medical Biology

Since November 2005, JASRI has further designated Medical Biology as a priority field to expand the number of users in this field by organizing a trial use from 2006A. In 2006A, 7 from 13 proposals were selected.

## Power User Proposal

The Power User Proposal category refers to proposals of user groups who have a complete understanding of beamline instrumentation, and are highly likely to produce excellent research results in the future. Such user groups are designated as Power Users (PUs) by JASRI and expected to provide support for general users. In return for their support, up to 20% of beamtime of relevant beamlines can be used by the PUs. Five groups were designated as PUs in May 2003. There have been 10 research subjects executed including five running subjects from 2005B and 2006A.

## Strategy Proposal

Strategy Proposals are expected to contribute to the promotion of research at SPRING-8, including the development of new technologies necessary for the operation of the facility. JASRI will conduct such research by itself or jointly with other organizations. The three following strategies research subjects were designated as follow:

- Analysis of Nanocomposite Materials (designated in May 2004)
- X-ray Pinpoint Structure Measurements (designated in January 2005)

- Observations of Biomolecular Structural Recognition Process from Highly Accurate Individual Single Molecular Movies (designated in October, 2006)

## Beamtime Reserved for JASRI

Twenty percent of the total beamtime is reserved for JASRI to conduct its own research programs, to flexibly accept the Urgent Proposals mentioned above, to modify and adjust the instruments according to the users' requests, and to maintain the beamlines.

## Industrial Research

In addition to the promotion of research activities in the field of basic science, the contribution to the reinforcement of the technological base in industry has been one of the main pillars of the SPRING-8 Project. In 2005, JASRI established the Industrial Application Division, by promoting Industrial the Application/Utilization Support Group. In this particular year, the division had intensively carried out the Advanced Large-Scale Research Facilities Strategic Utilization Program of MEXT, and has succeeded in doubling the number of new users conducting experiments at SPRING-8. The total number of proposals adopted for industrial applications accounts for more than 20% of the entire use.

The coordinator system, introduced in FY2000 to support industrial use, mainly through consultation, continues to play a crucial role in exploring and acquiring new users from industrial domains. The Trial Use Program has made a significant contribution to industries by revitalizing local industries and creating and promoting new industries. Public beamline BL19B2, Engineering Science Research Beamline, which was built to promote SR use by industries, is the primary beamline used for the Trial Use Program. There are three contract beamlines, which were constructed by the Industrial Consortium and Pharmaceutical Consortium for use by consortium members. There have been workshops and training courses organized to introduce a variety of research fields and SR instrumentation.

As mentioned at the beginning of this report, JASRI decided to donate 150 million yen to RIKEN in early 2006 for the construction of a new public beamline for industrial application (BL14B2 Engineering Science Research II), because it became clear that the number of proposals accepted for industrial applications was exceeding the capacity of BL19B2 (Engineering Science Research). The construction was initiated in late 2006, and is expected to be finished by the middle of 2007, immediately followed by public use.