

Three-Way Meeting 2008, APS



#### SPring-8 Research Complex **XFEL SPring-8** Construction JASRI (RIKEN) **Accelerator** Complex **Public Beamlines** Public Beamline Users (26 BLs) · Japan Atomic Energy Agency (4 BLs) • Institute for Protein Research, Osaka Univ. (1 iv. (1 BL) · Research Center for Nuclear Physics, Osaka **Contract Beamlines** National Institute for Materials Science (1 I (14 BLs) • Taiwan NSRRC (2 BLs) • Univ. of Hyogo (2 BLs) Industrial Consortium (2 BLs) · Pharmaceutical Consortium (1 BL) **RIKEN Beamlines** RIKEN Harima Institute at SPring-8 (7BLs) Laboratory of Advanced Science and **New SUBARU** Technology for Industry, Univ. of Hyogo



#### **Beamlines**



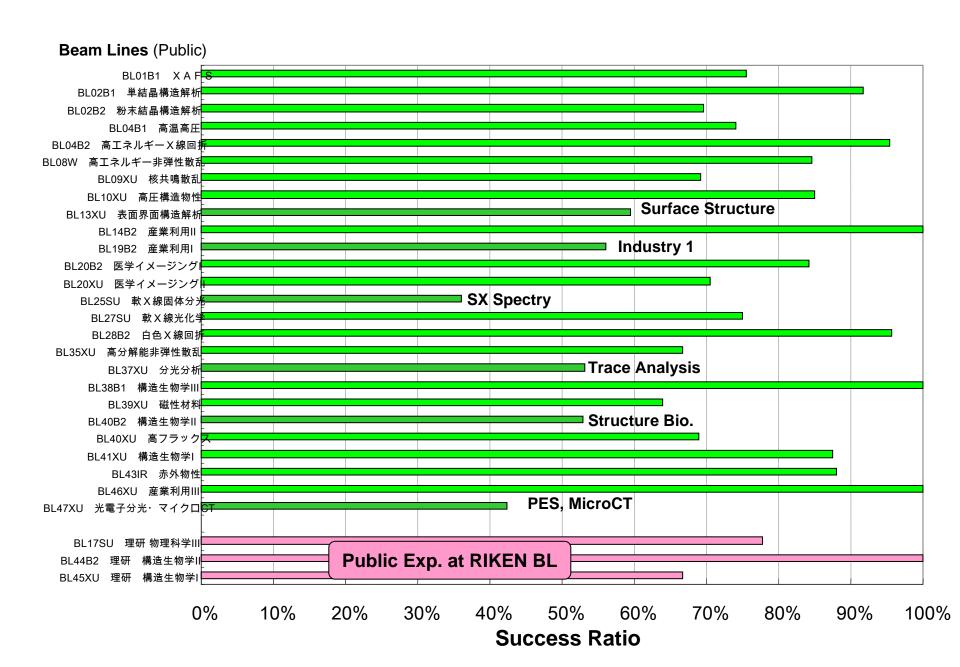
Maximum accommodation number is 62.

**49** Beamlines are operational (as of *September '07*):

26 Public, 14 Contract, 7 RIKEN, and 2 Diagnostic.

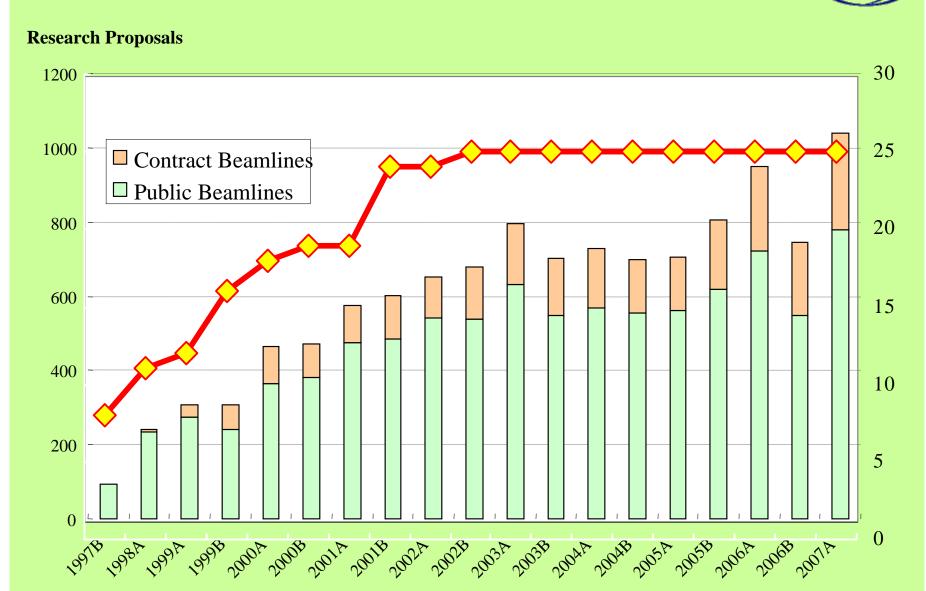
PLACE USE T	Davidas Diffrantias	BL02B2 ★										
★ BL04B1 High Temperature and High Pressure Research Powder Diffraction												
★ BL04B2 High Energy X-ray Diffraction	Single Crystal Structure Analysis	BL02B1 ★ BL01B1 ★										
★ BL08W High Energy Inelastic Scattering	HXPES•MCT	BL47XU ★										
BL08B2 Hyogo BM (Hyogo Prefecture)	Category No. of BLs R&D	BL46XU ★										
★ BL09XU Nuclear Resonant Scattering	RIKEN Structural Biology I	BL45XU ♦										
★ BL10XU High Pressure Research	Life Science	BL44B2 ♦										
BL11XU JAEA Quantum Dynamics     (Japan Atomic Energy Agency)	Magramalacular Accomplica	BL44XU •										
BL12XU NSRRC ID	(Institute for Protein Research, Os											
(National Synchrotron Radiation Research Center)	• Imaging/Medical/Biology3 Infrared Materials Science	BL43 IR ★										
BL12B2 NSRRC BM     (National Synchrotron Radiation Research Center)	Inner Structure, XRM  Structural Biology I	BL41XU ★										
★ BL13XU Surface and Interface Structures	• / Materials/Nanotechnology14											
<ul> <li>BL14B1 JAEA Materials Science</li> </ul>	New Materials 43 Structural Biology II	BL40B2 ★										
(Japan Atomic Energy Agency)	A / ///En/uronmont//noll/tical	BL40XU ★										
☆ BL14B2 Engineering Science Research II	Wagnetic Waterlais	BL39XU ★										
BL15XU WEBRAM     (National Institute for Materials Science)	Accelerator Bearin Diagnosis	BL38B2 ■										
BL16XU Industrial Consortium ID	30 // Structural biology in	BL38B1 ★										
(Industrial Consortium)  BL16B2 Industrial Consortium BM	High Pressure & Temperature  Trace Element Analysis	BL 37XII ★										
(Industrial Consortium)	• Physics Others 438	BLOTAG A										
◆ BL17SU RIKEN Coherent Soft X-ray Spectroscopy	High Resolution Inelastic Scattering	BL35XU ★										
◆ BL19LXU RIKEN SR Physics	• Chemical Sciences356											
★ BL19B2 Engineering Science Research I	33	BL33LEP •										
★ BL20XU Medical and Imaging II	• Industrial applications	A CONTRACTOR OF THE PROPERTY O										
★ BL20B2 Medical and Imaging I	Floatranias Pharmacourtical toutile Fliatiliaceutical industry											
BL22XU JAEA Quantum Structural Science	(i maintagation gaineritain is) i retain a	structure Analysis)										
(Japan Atomic Energy Agency)	Dealif Diagriostic											
BL23SU JAEA Actinide Science (Japan Atomic Energy Agency)	RIKEN Coherent X-ray Optics	BL29XU ♦										
BL24XU Hyogo ID (Hyogo Prefecture)	White Beam X-ray Diffraction	BL28B2 ★										
★ BL25SU Soft X-ray Spectroscopy of Solid												
◆ BL26B1 RIKEN Structural Genomics I	Soft X-ray Photochemistry	BL27SU ★										
TIMEN Structural Genomics I	RIKEN Structural Genomics II	BL26B2 ♦										

# Success Ratio of Proposals at each BL (2007B)



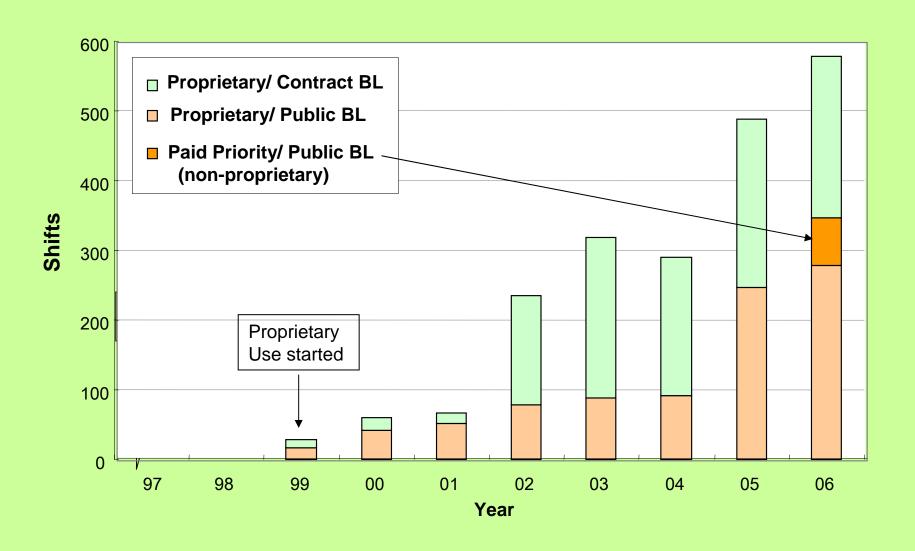
### Accepted Proposals





**Research Term** 



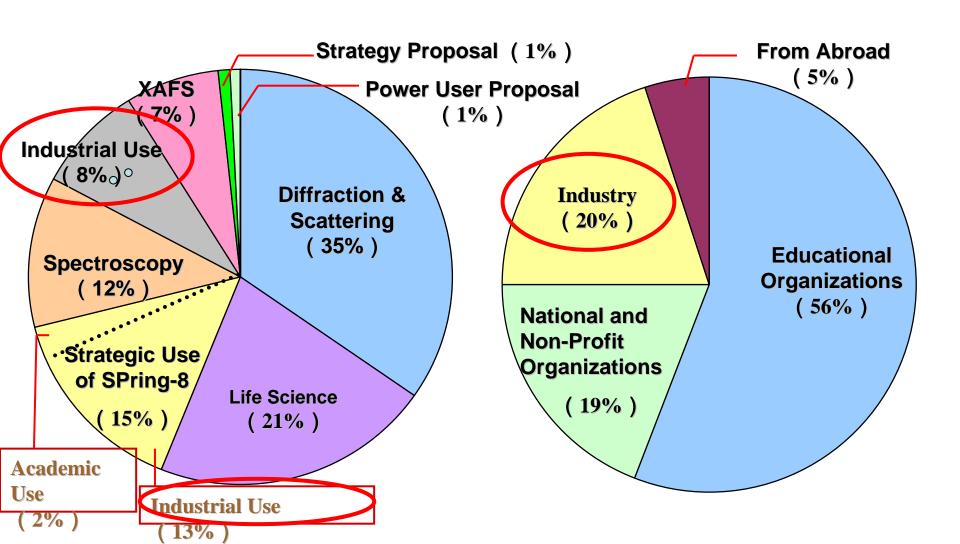


# User Attributes (2006)



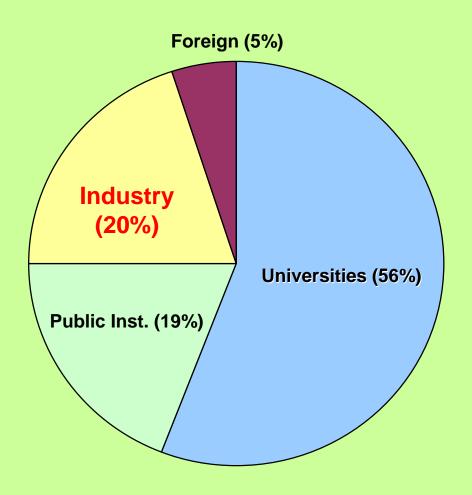
Fields of Applications

**User Affiliation** 



## Ratio in the Subject Numbers





The of Private Sectors' Share:

20% in the SUBJECT NUMBER



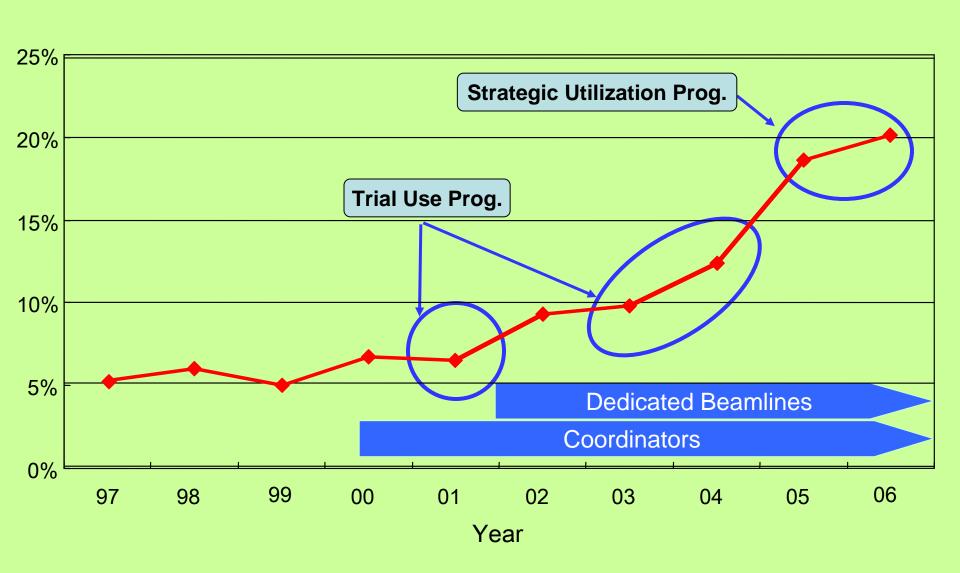
15.1% in the BEAM TIME.



Difference in the Time per Subject.

## Percentage of Industrial Use

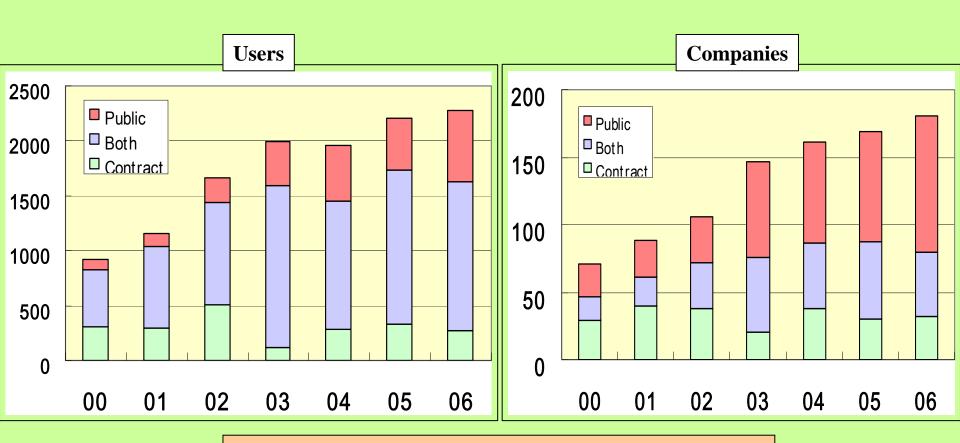




### Utilization by Private companies



for Both Public and Contract Beamlines



Total 2300 Users from 180 Companies/ Year

The quality of the industrial use is drastically rising.

# What Happened Recently at SPring-8 since Last 3WM 2006



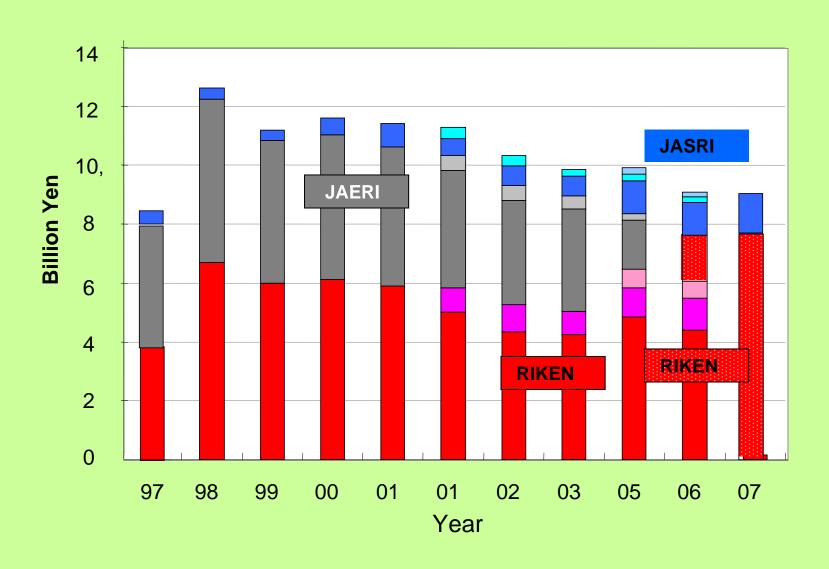
- International Advisory Council (July 2006)
- Amendment of the Law, effective 1 July 2006
- Construction of the XFEL started (April 2007)
- Call for proposals for new contract beamlines
   Ohno
- Cheiron School as an activity of Asia-Oceania Forum Takata
- A new industry-dedicated public beamline (September 2007) Ohno
- The 10-th Anniversary of Inauguration of SPring-8 (October 2007)
- The rise of social status Coming:
- Peer review of the results of the academic use (November 2008)

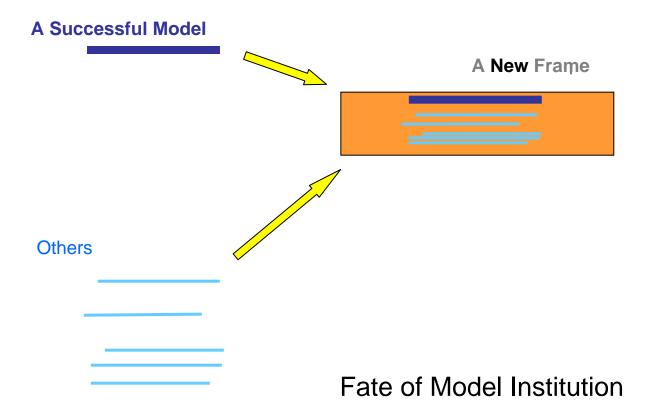
# Reputation of SPring-8 in Japanese Society

- The World No.1 or Frontier Facility for Observation and Analysis
  - Used to be: The World-Best Generator of the Light of Dream
- The Model for Public Common Research Facilities
  - Owing to the success in Industrial Utilization\*
  - Tailwind (from headwind in the past)

<sup>\*</sup>If I may say, the industrial use sharing 20 % supports the logistics of Spring-8.







# Coming Situations for the Big Machine

#### **General Trend**

Rush in construction of high-spec midium-energy (-3 GeV) Machine

 Vacuum-shielded Undulator of SPring-8 contributed to it.

#### Spring-8

The X ray of the highest energy in the world

The high operation cost compared with the medium machine



## Spring-8 (other 2 bigs, too) needs

- •The output worthy of the high running cost = Excelent Results
- The enhancement of utilization of the high energy X rays
- The policy setting for the ratio of high- and low energy utilization. (Japan has no medium new-generation machine)

Socialization (an Oxford Dictionary):

The process by which somebody, especially a child, learns to behave in a way that is acceptable in their society.

SPring-8 was a genius with extraordinary abilities but did not behave so as the society expected to this genius.

#### The Change written in a motto form

# 1. Of the experts, by the experts, for the experts.

Only experts are welcome:

The user should study hard on synchrotron radiations before coming to Spring-8 for experiment.



Promise of industrial utilization Invasion of barbarians from industries

# 2. Of the people, by the experts, for the people.

The people include the experts, thus, Motto 2 is more inclusive than Motto 1.

#### Way to the Socialization

#### Options:

- 1. Nobel Prize: depends on a user's ability and luck.
- 2. Industrial Utilization: The facility can manage to same extent.

This Option's Merits: Strong Support of the Government

Two policies for promotion of industrial utilization

Trial Use and Strategic Utilization Programs

which provided both the budget and the personnel.

It took me 5 years to have the society appreciate the industrial use of Spring-8.

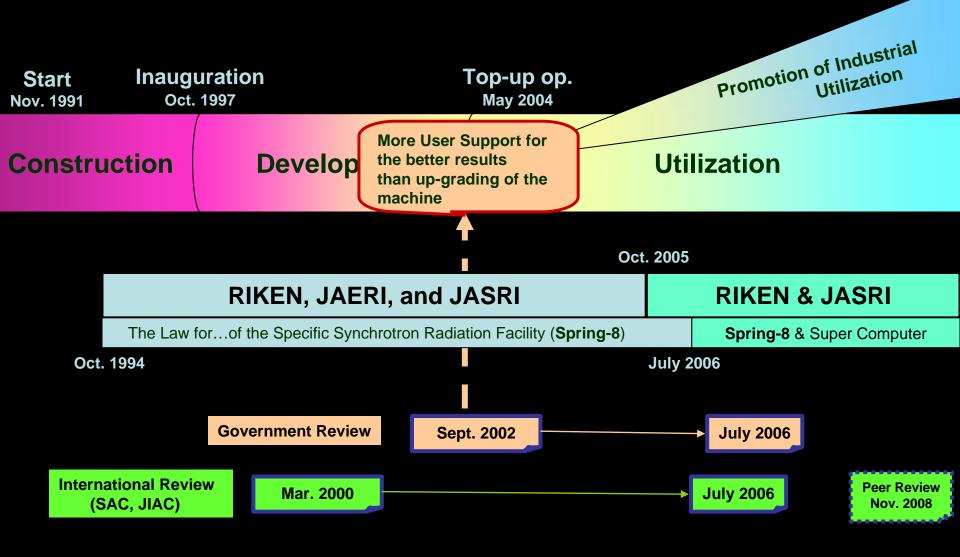
Major Criticism:

Catering to (playing up to) the Government.

Suppressing the academic research.

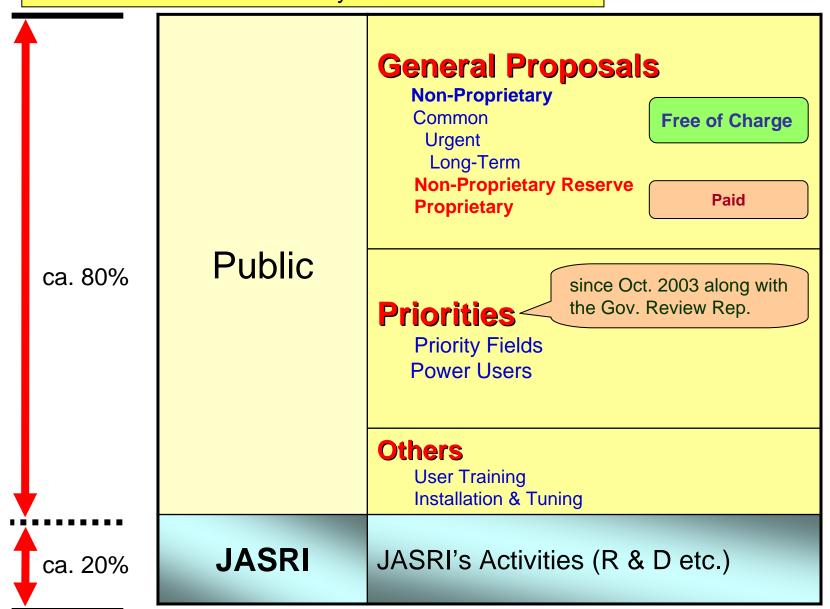
# Management of SPring-8





# Policy of Time Distribution in Common BL since July 06





# History of Industrial Utilization





Ind. II: BL14B2

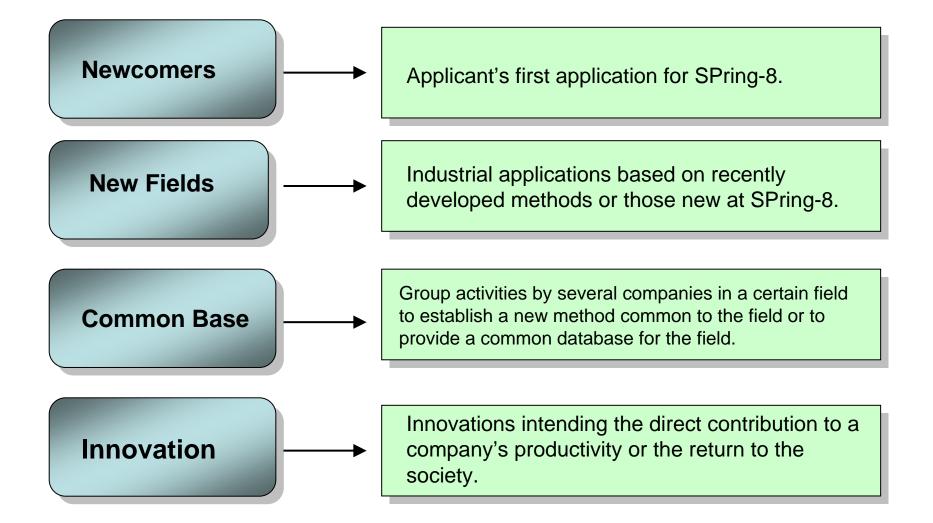
**Industry Dedicated Beamline: BL19B2** 

Support Group				Support Div.			Industrial Application Div.					
C: 4 T: (7)	C: 3 T: ~11		C: 3 T: ~11	C: 4 T: 8		C: 4 T: 9	C: 8 T: 14	C: 9 T: 15		C: 9 T: 15		

C: Coordinator T: Technician

# Categories





## Contribution to Industry: 190 Companies used Spring-8 in 2005



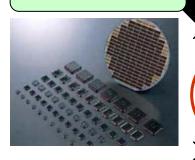
Various fields of industries, not concentrating on pharmaceutical

- •Films for ULSI, semiconductors
- •HDD, DVD
- Semiconductor laser

- Steel & Coats on steel
- •Al included bubbles

- Fibers
- Tires

#### **Electronics**



Automobile

**SPring-8** 



Metals & Soft Materials



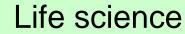
Energy & Environment



- •Batteries: fuel cell & Li-ion
- Analysis of contamination elements
- Catalysts for environment

#### Others

- Building materials
- Catalysis
- Insects



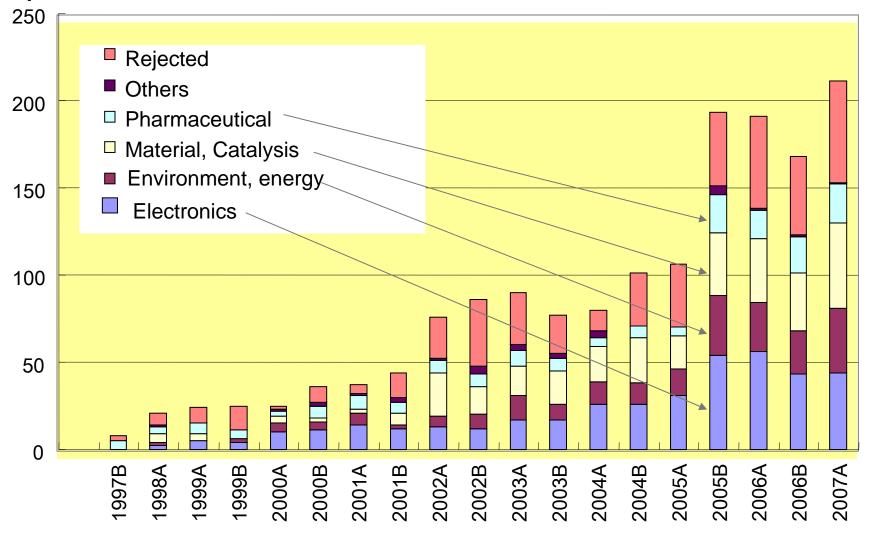


Medicine

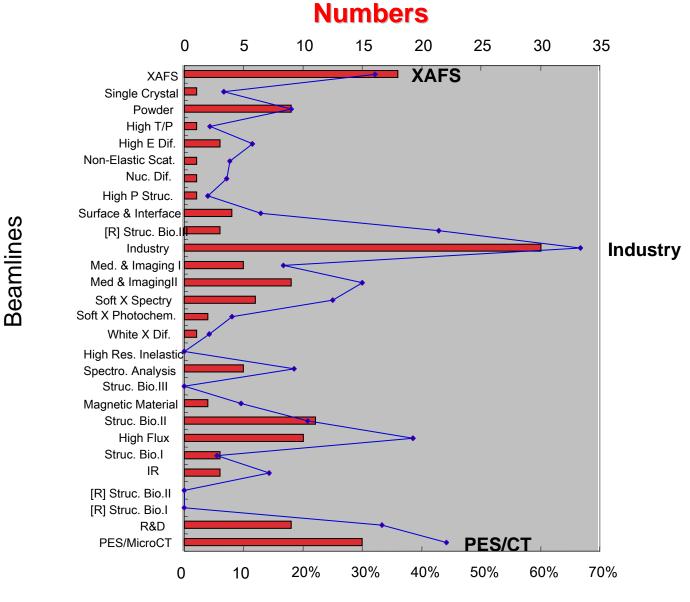
# Fields of Experiments by Private Sectors



#### **Proposals**



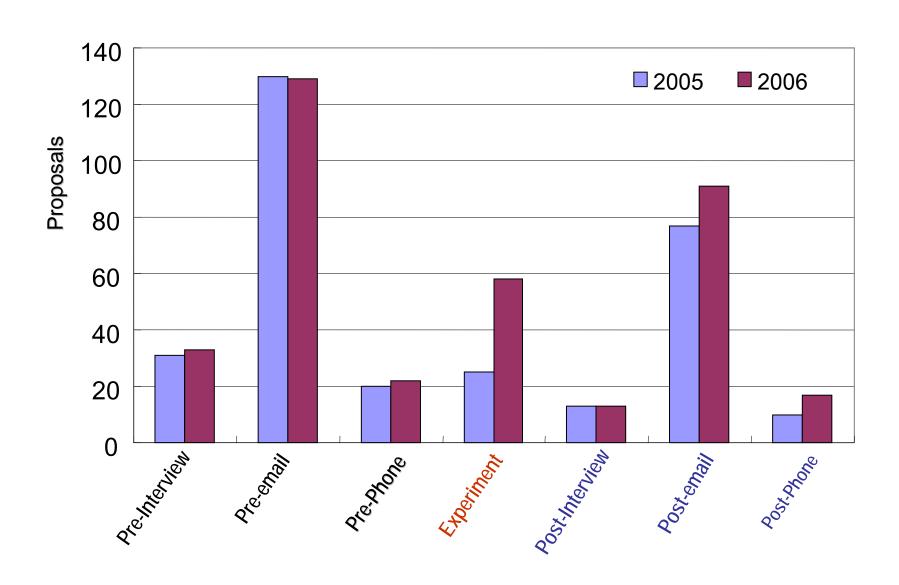
# Utilization by Private Sectors (2007A)



Ratio at each Beamline (%)

# Coordinators' Assistance for Proposals Reaching to Application





# Toward the Future (2006 ver.)

Keeping the highest standards of a SR facility Exploring new fields of SR sciences: Inviting new potential users:

> not only in academia but also in industry not only SR experts but also SR novices

Providing more assistance and user-friendly equipments (necessary for inviting non-experts)

Starting entrusted analysis
Offering various options in utilization

depending on various virtues

Changing beam-time allocation procedures
Rearranging the beamlines to accommodate more users

# Toward the Future (2008 ver.)

Construction of the XFEL

Connection of XFEL Accelerator and the Storage Ring

- Keeping the highest standards of a SR facility Nano-beam, time resolution
- Exploring new fields of SR sciences:

Strong combination of academia and industry Inviting new potential users:

(not only in academia but also in industry)

not only SR experts but also SR novices

Providing more assistance and user-friendly equipments not only for industry but also for academia

(necessary for inviting non-experts)

Starting entrusted analysis

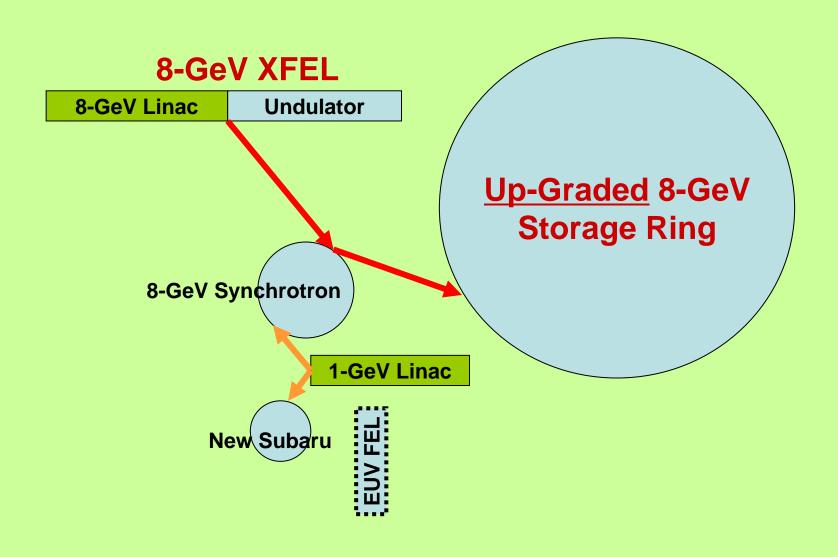
Offering various options in utilization

depending on various virtues

Changing beam-time allocation procedures
Rearranging the beamlines to accommodate more users

# Spring-8 Campus in 201X

The only place having both SR and XFEL



### Academic Research

Cutting-edge (academic) research that demonstrates the inevitability of Spring-8 (or of high-energy big machine) is demanded for the raison-d'etre of Spring-8 and for the reasoning of further development of the Ring.

Strategic selection of the proposal from this point of view should be considered. (20 % may support the all)

The results of the academic research should be published in a form which responds to the society's demands.

A peer review of academic research is scheduled in November '08.



