



National Synchrotron Radiation Research Center

Synchrotron Radiation Protein Crystallography Facility

User Committee Meeting

Core Facility Report

Yuch-Cheng Jean

Oct. 20, 2010

NSRRC



核心設施第三期計畫(2008.05.01 – 2011.04.30)組織

總主持人：	王惠鈞
核心辦公室主任：	蔡明道
核心辦公室經理：	袁佩宜
主持人：	陳建德
共同主持人：	袁小玲、蕭傳鐙
設施經理：	簡玉成、趙俊雄

使用者委員會



詹迺立
王雯靜、伍素瑩、周三和
馬 徹、孫玉珠、殷獻生
徐駿森、陳俊榮、楊啟伸
廖彥銓、廖淑惠、鄭貽生



Outline

- I. Service Statistics and Research Outcomes**
- II. Training and Dissemination Activities**
- III. Beamline Development**



I. Service Statistics and Research Outcomes



BL13B1 Service Statistics

BL13B1 Beamtime Period	# of Visit User Groups	# of Conducted Experiments	# of Trained Users	# of Beamtime Hours Delivered	% of Beamtime Used for Service
2005-3	10	13	102	1096	65.9 %
2006-1	13	18	133	1142	76.7 %
2006-2	17	31	231	1574	86.5 %
2006-3	17	30	198	1541	77.8 %
2007-1	19	27	155	1092	90.9 %
2007-2	23	39	229	1830	89.5 %
2007-3	24	37	217	1649	88.5 %
2008-1	26	45	238	1720	90.9 %
2008-2	26	42	231	1604	81.4 %
2008-3	27	37	209	1231	77.5 %
2009-1	31	49	280	1764	88.1 %
2009-2	26	33	195	879	86.8 %
2009-3	38	59	300	1969	86.3 %
2010-1	28	32	162	967	83.3 %
2010-2	38	45	202	1686	85.6 %
Sum	362	535	3073	21672	83.8 %

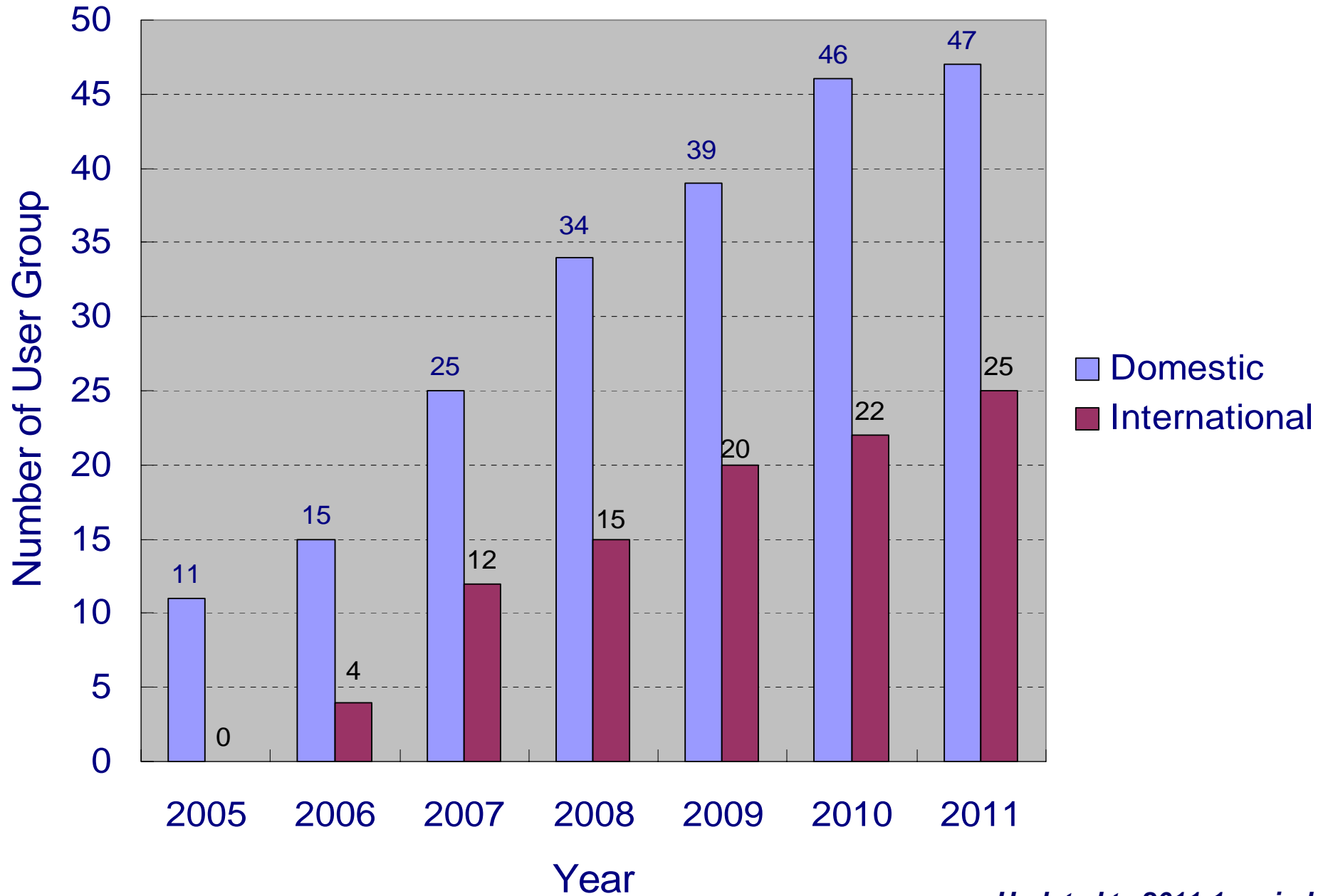
Updated to 2010-2 period

BL13C1 Service Statistics

BL13C1 Beamtime Period	# of Visit User Groups	# of Conducted Experiments	# of Trained Users	# of Beamtime Hours Delivered	% of Beamtime Used for Service
2006-1	11	16	127	1118	76.3 %
2006-2	15	21	141	1253	67.4 %
2006-3	11	21	150	1154	58.3 %
2007-1	15	21	115	920	81.3 %
2007-2	16	23	145	1179	57.7 %
2007-3	20	33	164	1471	78.9 %
2008-1	19	30	175	1552	82.0 %
2008-2	22	28	169	1667	84.7 %
2008-3	24	25	158	1264	79.6 %
2009-1	21	30	179	1625	81.1 %
2009-2	20	21	122	793	80.7 %
2009-3	27	28	153	1718	75.3 %
2010-1	26	27	135	915	78.9 %
2010-2	26	27	156	1257	63.8 %
Sum	272	350	2119	17887	73.9 %

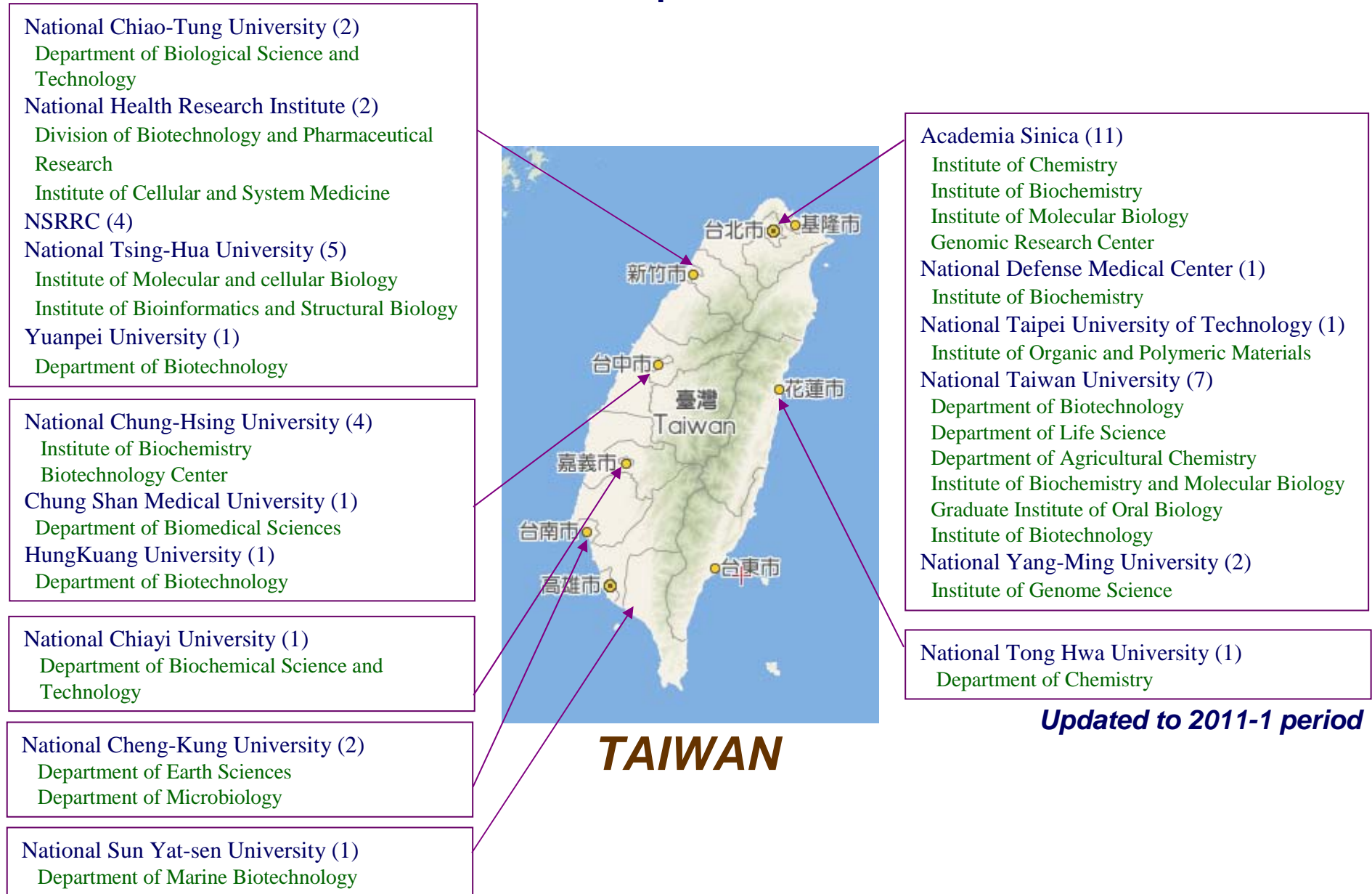
Updated to 2010-2 period

Growth of User Groups



Updated to 2011-1 period

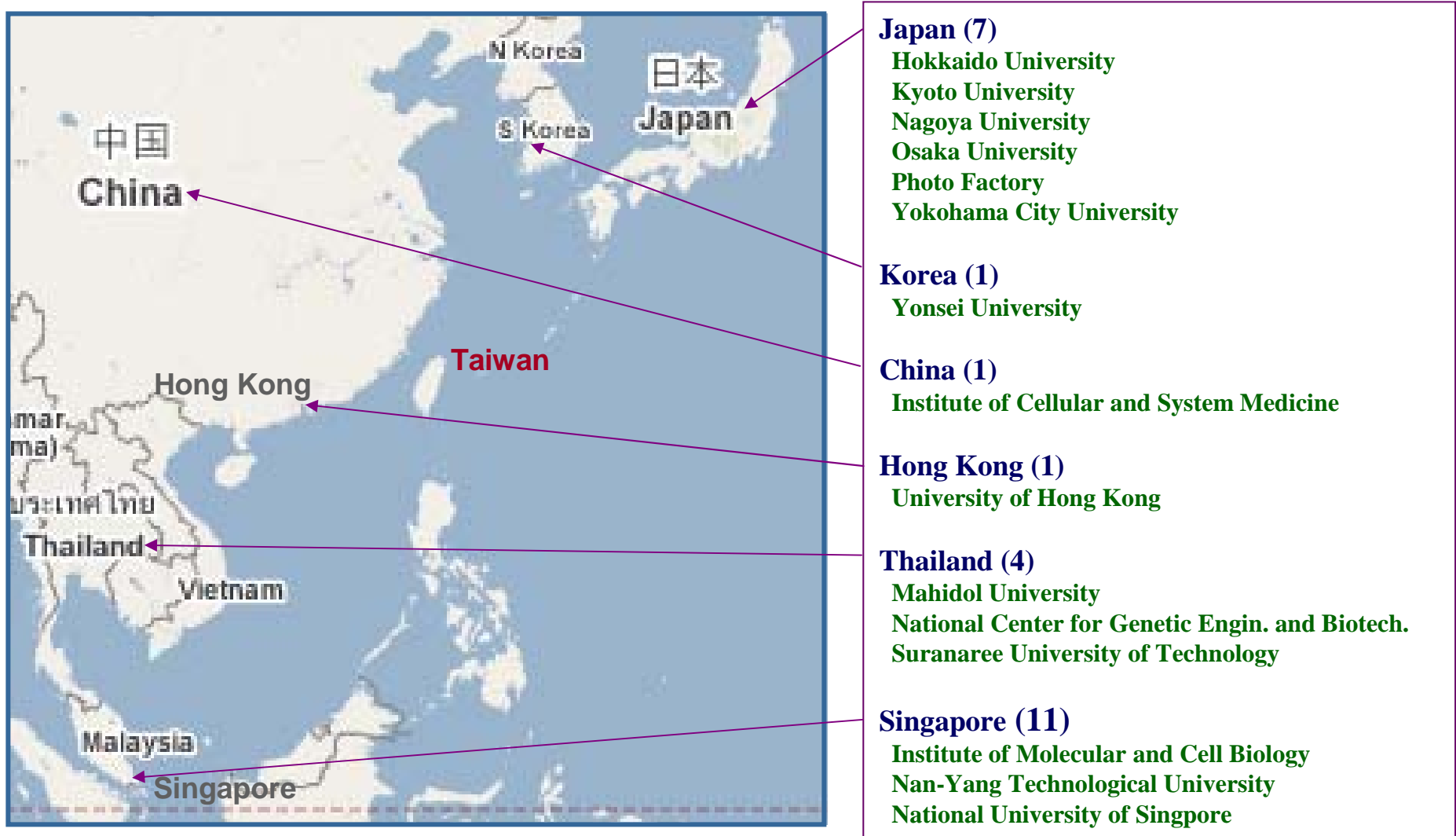
User Group Distribution



Updated to 2011-1 period

There are currently 47 domestic users and 25 international users

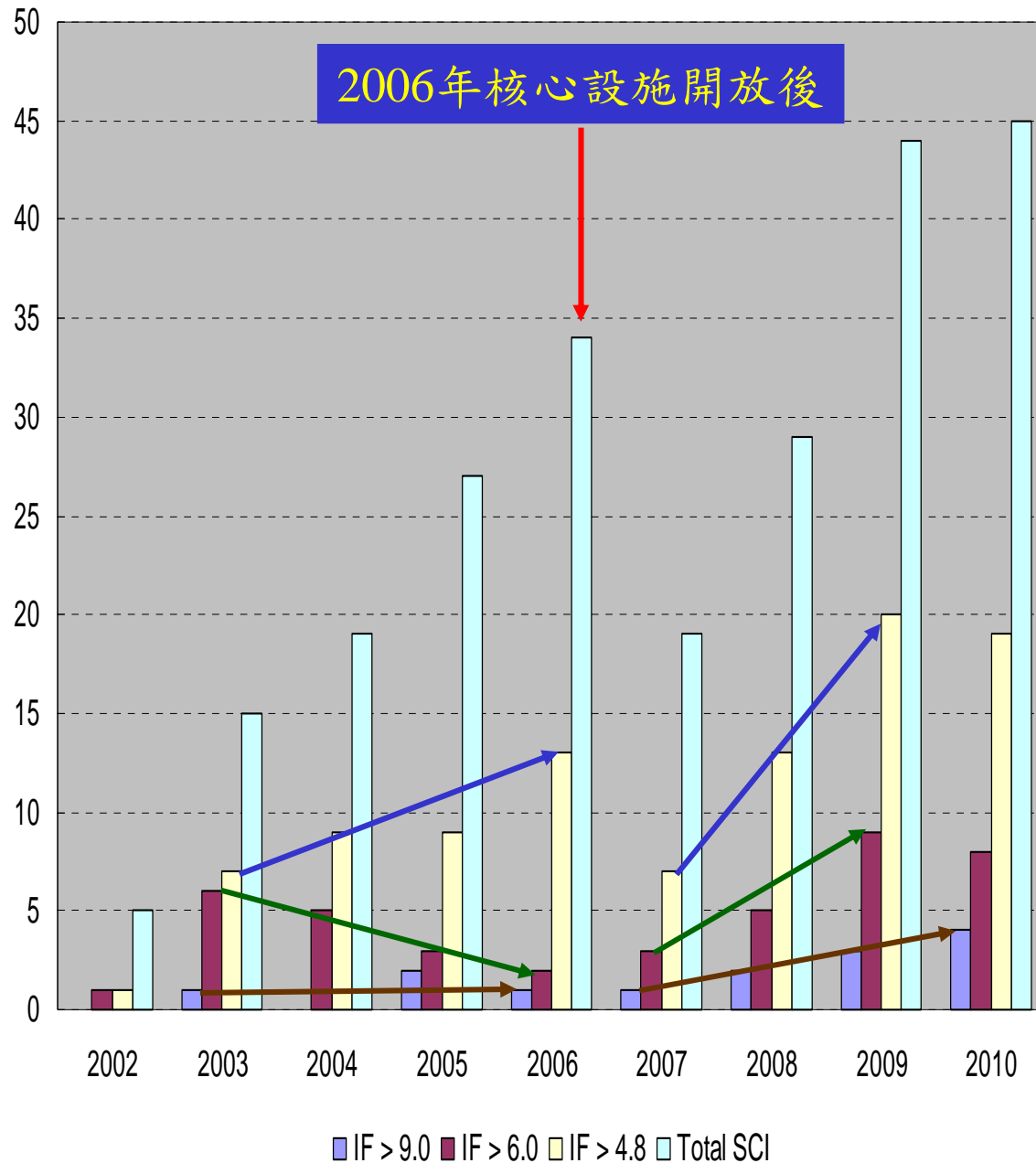
User Group Distribution



Updated to 2011-1 period

There are currently 47 domestic users and 25 international users

Number of User Publications



- Science
- Nat. Struct. Mol. Biol.
- Angew. Chem. Int. Ed.
- Plant Cell
- Proc. Natl. Acad. Sci. USA
- Curr. Opin. Struc. Biol.
- EMBO J.
- J. Am. Chem. Soc.
- Nucleic Acids Res.
- FASEB J.
- Plant Physiol.
- Mol. Cell. Bio.
- Structure
- J. Biol. Chem.
- RNA
- Biochem J.
- J. Med. Chem.
- Plos One
- J. Mol. Biol.
- J. Struct. Biol.
- Proteins
- ...

Last updated: Oct 19 2010

II. Training and Dissemination Activities



2010 PX Training Activities

2010.05.26~27	Workshop for Remote User Access
2010.08.09~13	2010 PX Training Course

2011 PX Training Activities

2011	2011 PX Winter School
2011	2011 PX Training Course



2010 Workshop for Remote User Access (5/26-27, 36 Trainees)



2010 PX Training Course (8/9-13, 16 Trainees)



III. Beamline Development

1. Beamline Automation
2. Remote Access
3. Mail-in Service

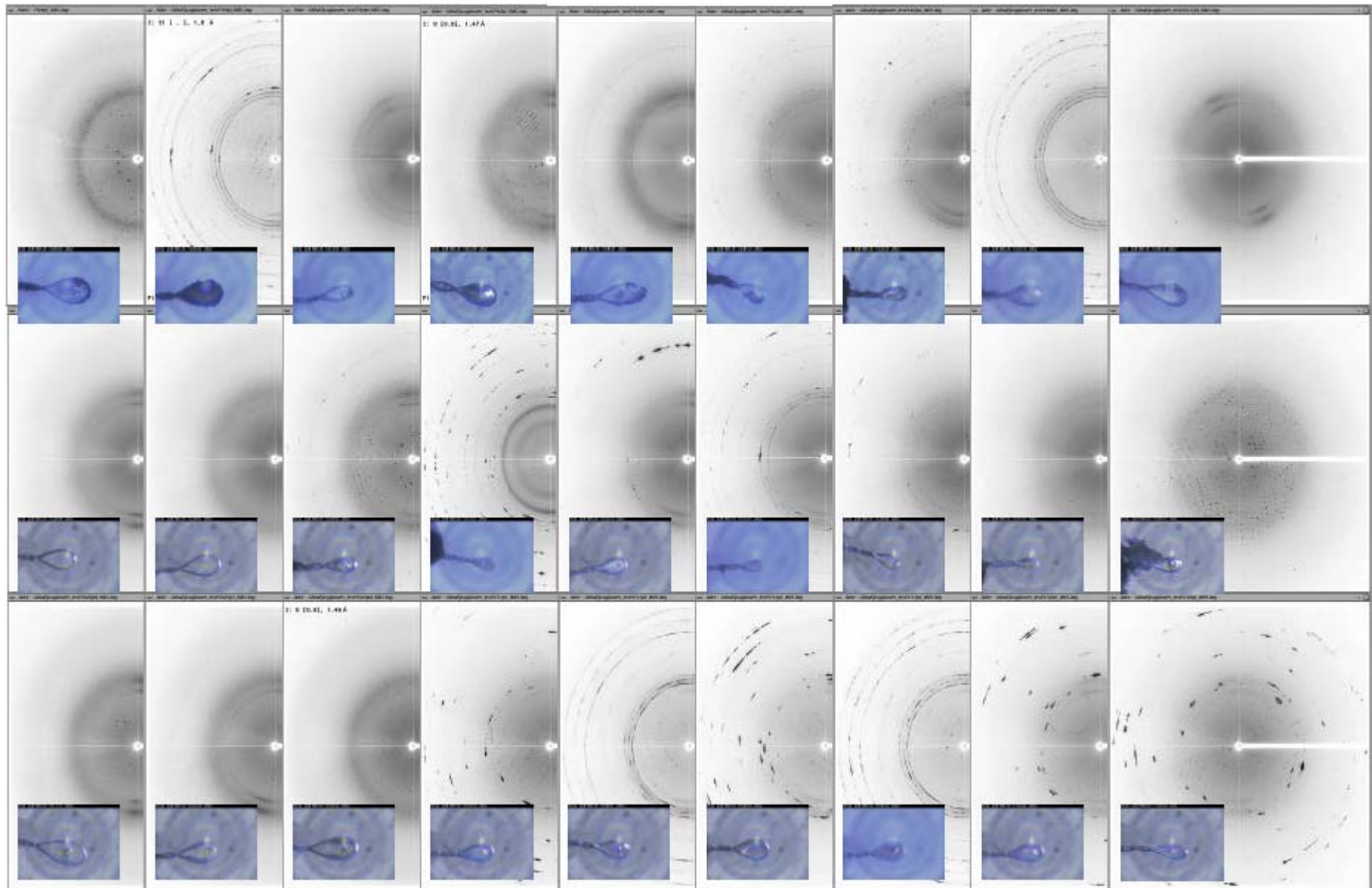


Beamline Automation

- Auto-intensity monitoring & optimization
- Auto-sample mounting (Blulce)
- Auto-sample centering (Blulce)
- Auto-sample screening (Blulce)
- Auto-MAD energy selection (Blulce)
- Auto-sample lighting (Blulce)
- Auto-sample annealing (Blulce)



Enable High Throughput Screening



PAM Robotic System Used at PF



Status

	Place	Status	Remarks
1st robot - PAM1	BL-5A	unavailable	
2nd robot - PAM2	AR-NW side room	available	for R&D
3rd robot - PAM3	AR-NW12A	unavailable	
4th robot - PAM4	BL-17A	unavailable	
5th robot - PAM5	AR-NE3A	unavailable	
6th robot	BL-1A		underdevelopment

Dr. Masato Kawasaki, Structural Biology Research Center, PF, KEK

Mechanism of linkage-specific polyubiquitin recognition by NEMO (NF- κ B essential modulator)

2009/9/18 – 2009/9/21, at BL13C1

Name	Position
<u>Soichi Wakatsuki</u>	Professor
Ryuichi Kato	Associate Professor
Noriyuki Igarashi	Associate Professor
Masahiko Hiraki	Associate Lecturer
<u>Masato Kawasaki</u>	Assistant Professor
Naohiro Matsugaki	Assistant Professor
Yusuke Yamada	Assistant Professor
Leonard Chavas	Assistant Professor
Kentaro Ihara	Post Doctoral Fellow
Norio Kudo	Post Doctoral Fellow
Nobuhiro Suzuki	Post Doctoral Fellow
Hisayoshi Makio	Post Doctoral Fellow
Seiji Okazaki	Post Doctoral Fellow
Tamami Uejima	Research Fellow
Ken Okubo	Ph.D. Student
Kensuke Nakamura	Ph.D. Student
Simin Rahighi	Ph.D. Student
Ahmed Rohaim	Ph.D. Student

Dr. Masato Kawasaki, Structural Biology Research Center, PF, KEK

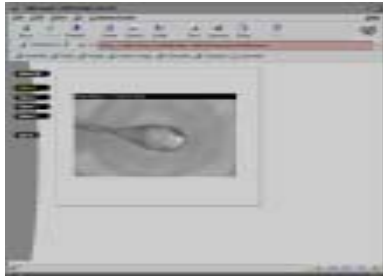
Mechanism of linkage-specific polyubiquitin recognition by NEMO (NF- κ B essential modulator)

2010/9/11 – 2010/9/13, at BL13B1

User no.	Name	Affiliation	Phone number	E-Mail
13970	Kawasaki, Masato	High Energy Accelerator Research Organization (KEK), IMSS, Photon Factory (PF)	+81-29-879-6176	masato.kawasaki@kek.jp
15646	Nagae, Masamichi	Osaka Univ., Inst. for Protein Research	+81-6-6879-8608	mnagae@protein.osaka-u.ac.jp
14433	Nakamura, Kensuke	High Energy Accelerator Research Organization (KEK), IMSS, Photon Factory (PF)	029-879-6181	kensuke@post.kek.jp
15599	Nakata, Zenzaburo	Osaka Univ., Inst. for Protein Research	+81-6-6879-8607	z3@protein.osaka-u.ac.jp
14540	Nogi, Terukazu	Osaka Univ., Inst. for Protein Research	+81-6-6879-8607	nogi@protein.osaka-u.ac.jp
15663	Sakurai, Tetsuya	High Energy Accelerator Research Organization (KEK), IMSS, Photon Factory (PF)	+81-(0)29-879-6178	Sakurait@post.kek.jp
14411	Satoh, Tadashi	RIKEN/SPring-8, Advanced Science Institute	+81-48-467-9619	tadashisatoh@riken.jp
15632	SUZUKI, HIRONORI	High Energy Accelerator Research Organization (KEK), IMSS, Photon Factory (PF)	+81-29-879-6178	suzuhiro@post.kek.jp

Enable Remote Access Data Collection

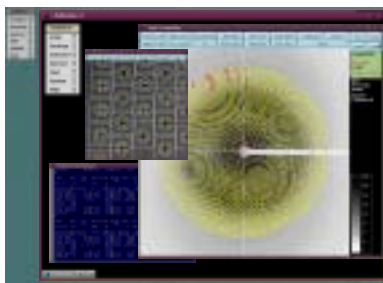
Remote Users



Web-based Video



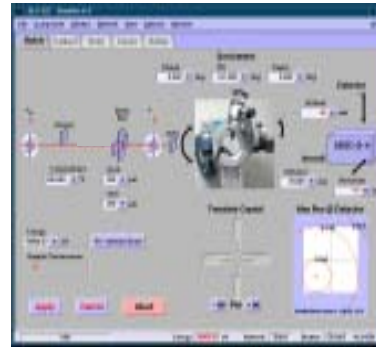
Data Collection



Data Processing

Local Users

Data Collection Software



Data Processing Software



Video Server
NX Server



Beamline Optics



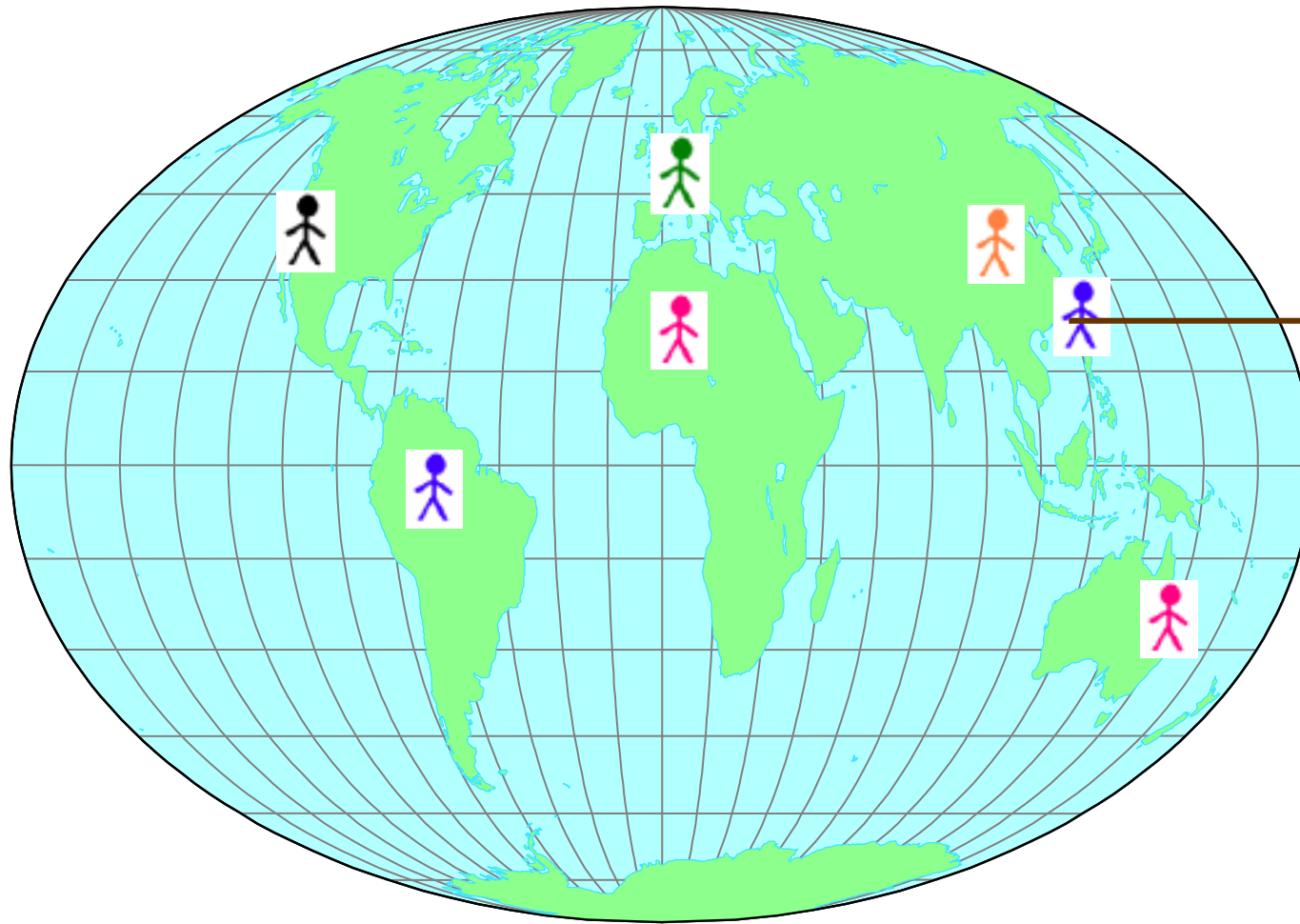
Experimental Station



Computing System

Collaboratory : A Facility without Wall

- Remote access to experimental facilities during beamtime
- Continued access to data and computing after beamtime



Beamline Optics



Experimental Station



Computing System

Allow a team of researchers distributed anywhere in the world to perform a complete crystallographic experiment together, from data collection to structure determination.

BioNSRRC Mail-In Data Collection Team (2010)



Ina
Support Staff



Morten
Support Staff

In order to provide both expert and non-expert academic users more extended service, a Mail-in data Collection service is now available for non-proprietary users of the BioNSRRC beamlines. “Mail-in data Collection” is a **relatively inexpensive** (cost of sending a dewar) **and efficient means of beamline operation**. Users send their crystals to a BioNSRRC beamline for local beamline staff to collect data on the user’s behalf.



Ways of Data Collection at BioNSRRC

- On-site Data Collection
- Remote Data Collection
- Mail-in Data Collection



Tetative Delivery Target Year

Capability	Beamline	FY 2008	FY 2009	FY 2010
Automation	13B1	No	Yes	Yes
	13C1	Yes	Yes	Yes
Remote Access	13B1	No	No	Yes
	13C1	No	Yes	Yes
Mail-In Service	13B1	No	Yes	Yes
	13C1	No	Yes	Yes



- ▣ 下一期總計畫所需之核心設施
- ▣ 成為政府補助之國家型核心設施，服務全國
- ▣ 獲同意成為機構托管之核心設施，經費由機構提供
- ▣ 成為公辦民營之核心設施，某程度上能以服務收入滿足核心設施之支出
- ▣ 成為私營之核心設施，以自給自足方式營運
- ▣ 未獲任何補助或托管之核心，國科會將回收其所有設備並以公開徵求方式提供最適合之研究人員託管及使用

NRPB 核心設施

1. 基因及蛋白質結構分析

基因結構分析 (主要為Next Gen Sequencing)

蛋白結構分析

2. 疾病動物模式

3. 微生物醱酵系統建置及毒理運作

4. 小試量化學合成

5. 藥物及生物性樣品庫

6. 轉譯醫學(提供技術及諮詢平台)

* NRPB提供核心設施專屬服務NRPB研究所
需之設備費、人事費、耗材費

國科會 - 生技類國家級核心設施

A2 - MRI

A3 - μ PET

A4 - Transgenic Mice

A7 - Mouse Clinic

B1 - 基因醫藥臨床中心

C1 - 高通量基因體分析

C2 - 基因型鑑定中心

C5 - 整合型功能基因體

C6 - RNAi

D2 - Proteomics and Glycomics

D3 - Protein production and X-ray

D4 - Synchrotron Radiation

D5 - NMR

E2 - GMBD Bioinformatics

E3 - ABC Bioinformatics

* 經評估為NRPB及國內生技類研究需
要之核心設施後，由國科會繼續補助
營運所需經費



國家同步輻射研究中心
National Synchrotron Radiation Research Center

Thank You for Your Attention

NSRRC

