



The First Asia-Europe Physics Summit

“Physics towards Science Innovations”

Epochal International Congress Center, Tsukuba - March 24-26, 2010

„International Centers for Theoretical Physics:
Two examples“



Approach to Theoretical Physics

Traditional approach (e.g. Germany, Japan)

Full Professors (chair) + typically 3-5 associates, assistants, ususally non-permanent employment, form research unit

- guaranteed annual budget („Grundausstattung“)
- units work together on related topics
- professor feels responsible for the career of his assistance

Changes which have been taking place:

- Reasons:**
- changes in **social attitudes** – young researchers want to become independent at early stage, do not want to depend on a single person for their career
similar to Assistant Professor in USA
 - tremendous **growth of knowledge** – requires that young researchers form alliances with each other → less single author papers
 - new forms of **knowledge transfer** and of learning
 - **Results:** foundation of
 - **Junior Research Groups**
 - **Centers for Theoretical Physics**

Organisational Forms

International Centers for Theoretical Physics:

- **Workshops**; focussed programs on fields which develop rapidly, experts + young scientists come together
- **strong research program** either in-house or at a neighbouring institute
- act like **magnets** for top young people, try to **optimize** the **development** of **talents** and of independent and original thinking
- **Junior Research Groups**:
 - set up for five years each
 - leader selected after a very careful selection process
 - gets own budget for hiring + general expenses
 - chooses his research field

Examples

- Kavlin Institute in Santa Barbara
- MPI in Dresden
- ICTP in Trieste
- Newton Institute in Cambridge
- Yukawa Institute, Kyoto

Last not least: Asia Pacific Center for Theoretical Physics, Pohang, Korea

History of the MPI for the Physics of Complex Systems

- November 1992 ■ decision by the Senate of the Max Planck Society to create in Dresden the MPI-PKS as the third Max Planck Institute in former East Germany
- July 1993 ■ formal opening of the Institute, start of the first Department: Electronic Correlations, Condensed Matter
- January 1994 ■ start of the activities in Dresden in an old barrack
- September 1995 ■ start of the construction of the institute's new building and guest houses
- September 22, 1997 ■ official opening of the new building and of the guest houses
- May 1999 ■ setting up a second Department - Finite Systems
- February 2002 ■ start of a Department on Biological Physics
- December 2005 ■ completion of the new wing for the extension of the institute building



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Present structure

4 Divisions (Abteilungen)
consisting of five
scientists each

- Electronic Correlation
- Biological Physics
- Condensed Matter
- Finite Systems

5 Groups of young
scientists
(Nachwuchsgruppen)

- Motor Systems
- Dynamics of Biological Networks
- Many-Body Effects in Mesoscopic Systems
- Computational Nonlinear and Relativistic Optics
- Collective phenomena in solid state and material physics

5 Research groups
(Arbeitsgruppen)

- Nonlinear Time Sequence Analysis
- Stochastic Processes in Biophysics
- Complex Dynamics in Cold Gases
- New States of Quantum Matter
- Molecular Quantum Optics

Workforce at the Institute

• Scientists (non-permanent positions from MPG)	13
• Guest scientists (long term)	72
- from abroad	61
- from Germany	11
• PhD students	41
- from abroad	16
- from Germany	22
- for special projects	3
• Administration	5
- apprentices	1
• Infrastructure	21
- apprentices	6
Total	152

Foreign guests scientist + PhD students

European Union:	27	North America:	6
Bulgaria	1	Mexiko	1
France	8	USA	5
Greece	2		
Great Britain	1	South America:	2
Ireland	2	Brasilia	1
Italy	1	Chile	1
Austria	1		
Poland	1	Africa	1
Sweden	3	Cameroon	1
Switzerland	1		
Spain	1	Asia and Middle East	29
Czech Republic	4	Armenia	1
Hungary	1	Bangladesh	1
		China	7
Other European Countries:	14	Georgia	1
Croatia	2	India	7
Russia	5	Iran	4
Turkey	2	Israel	1
Ukraine	4	Japan	1
Byelorussia	1	Jordan	1
		Korea	1
		Senegal	1
		Taiwan	1
		Vietnam	2
		Australia:	2
		Australia	2
Total:	81		

Workshops and Seminars

- 2002 ▪ 14 meetings with approximately 1200 participants
- 2003 ▪ 19 meetings with approximately 1300 participants
- 2004 ▪ 15 meetings with approximately 1160 participants
- 2005 ▪ 16 meetings with approximately 1200 participants
- 2006 ▪ 18 meetings with approximately 1450 participants
- 2007 ▪ 20 meetings with approximately 1550 participants
- 2008 ▪ 19 meetings with approximately 1440 participants
- 2009 ▪ 22 meetings with approximately 1650 participants

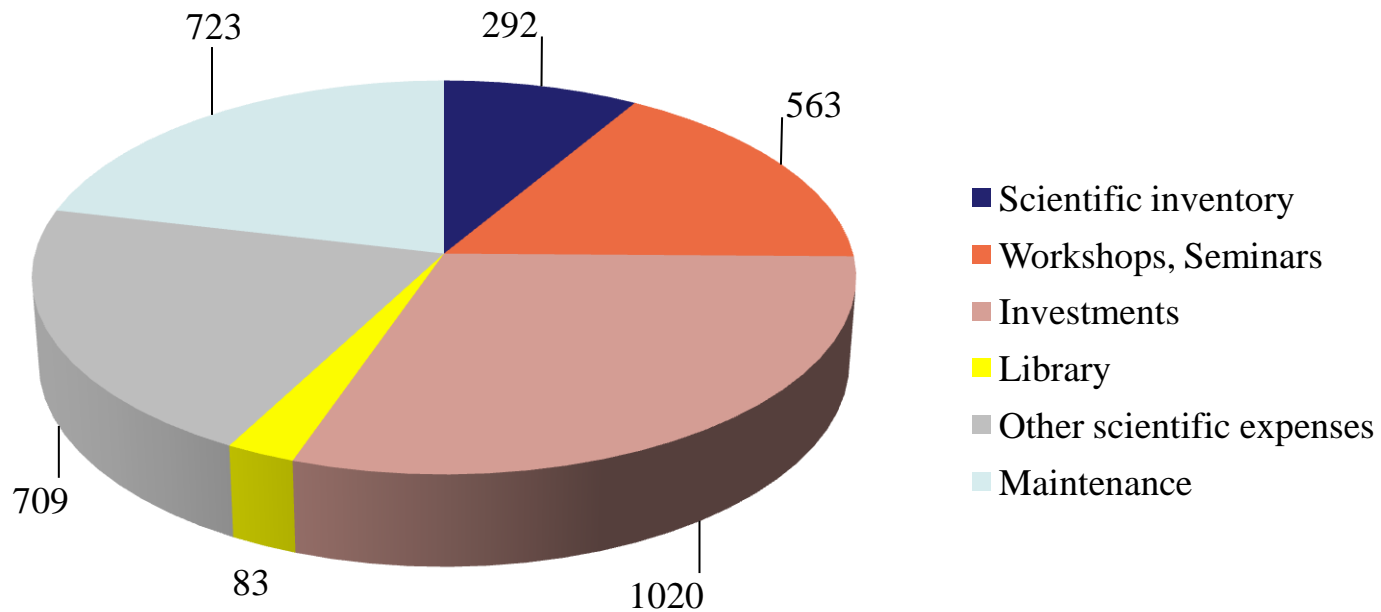
Expenses 2009

Total Budget 2009: 8,3 Million Euros

Investment and Supply

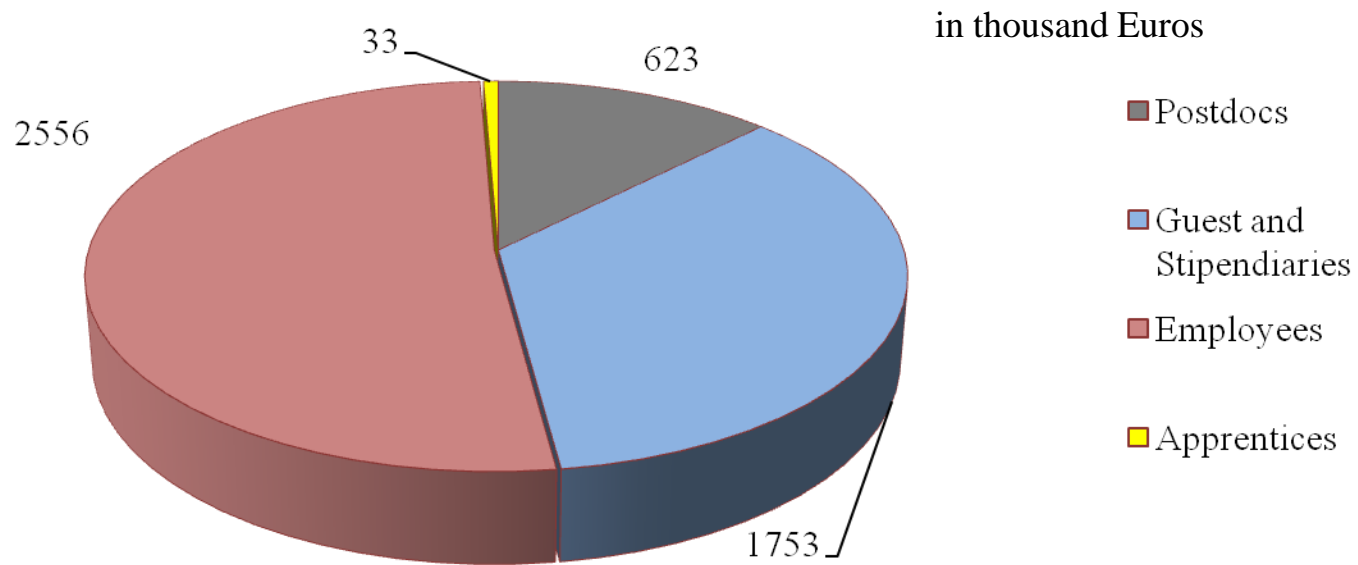
Total: 3.4 Million Euros

in thousand Euros



Expenses for workforce

Total: 5.0 Mill. Euros









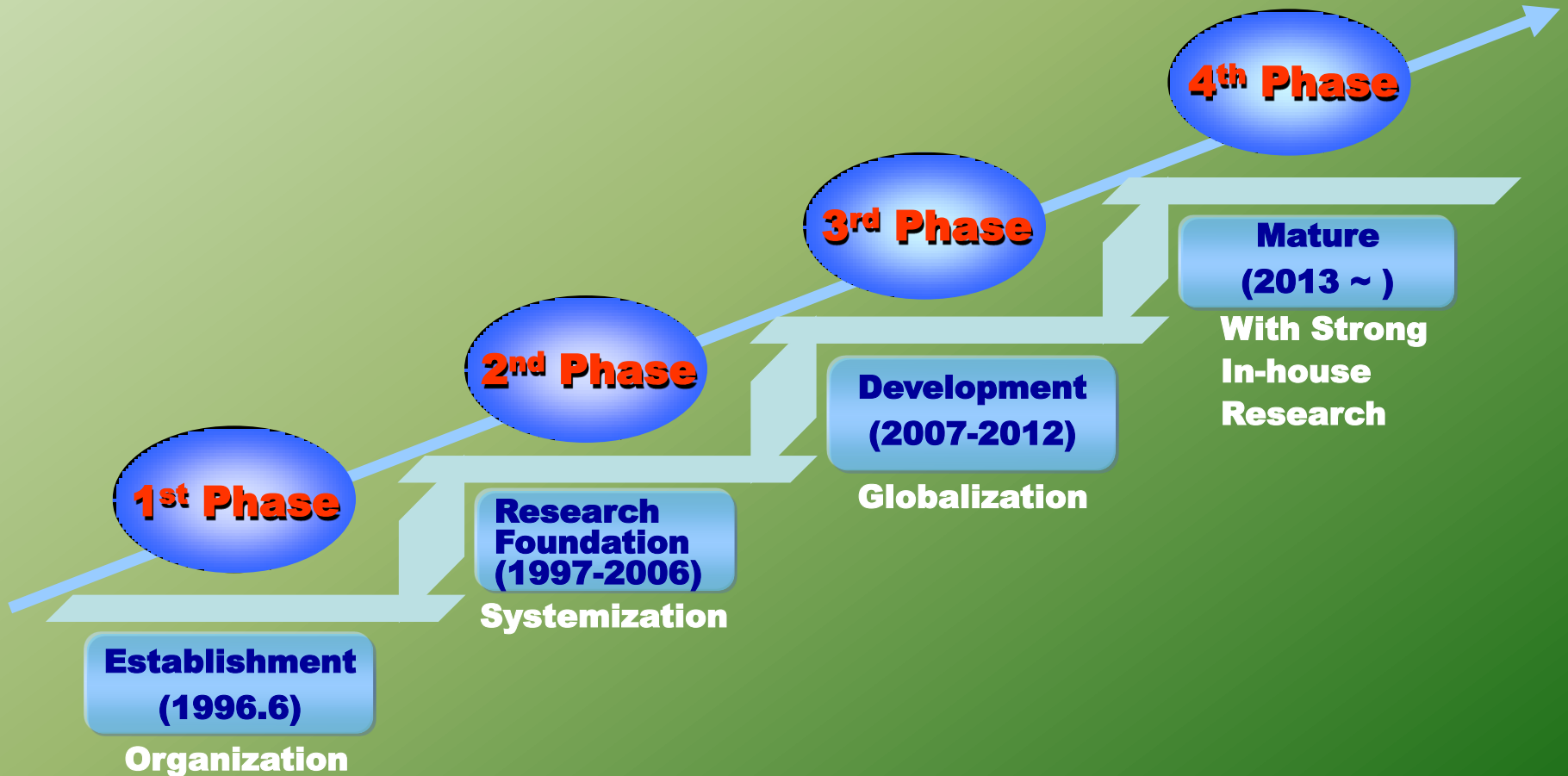


APC Report

Asia Pacific Center for Theoretical Physics



Development Stage



Milestones



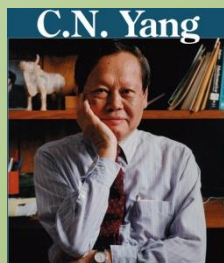
1996. 6
**Establishment
of APCTP**

1997. 1
**C.N. Yang
- Founding
President**

1999. 12
**Opening an
annex building
in Seoul**

2001. 8
**Relocate to
Pohang**

2001. 3
**A. Arima
- Chairman
of Board**



2004. 4
**R.B. Laughlin
- Second
President**

2005. 10
**Launch Web
journal
(Crossroads)**

2005. 10
**N. V. Hieu
- Chairman of
Board**

2006. 11
**APCTP 10th
Anniversary**

2008. 6
**Launch JRG
With MPG**



Membership (13 member countries)

- ◆ **Australia:** Australia Research Council (ARC)
- ◆ **Beijing:** National Natural Science Foundation of China (NSFC)
- ◆ **India:** Indian Association for the Cultivation of Science (IACS)
- ◆ **Japan:** RIKEN
- ◆ **Korea:** National Research Foundation of Korea (NRF)
- ◆ **Malaysia:** Malaysian Institute of Physics (MIP)
- ◆ **The Philippines:** National Research Council of the Philippines (NRCP)
- ◆ **Singapore:** World Scientific Co.
- ◆ **Taipei:** Academic Sinica
- ◆ **Thailand:** National Research Council of Thailand (NRCT)
- ◆ **Vietnam:** Vietnamese Academy of Science and Technology (VAST)
- ◆ **Lao PDR:** The Research Institute of Science,
Science Technology and Environment Agency (RIS-STEA)
- ◆ **Mongolia:** The Mongolian Academy of Sciences (MAS)

Scientific Activities

Year	Topical Research Program (No.)				Focus Program
	Seminar & Lecture	Mini-Workshop	School	Conference & Workshop	
2007	129	21	5	7	4
2008	169	16	5	13	4
2009	189	23	9	8	4

Junior Research Groups (JRG)



- Int'l collaboration between APCTP, Max Planck Society (MPG) & POSTECH
- Support each Junior Research Groups (JRG) for 5 years

JRG 1	JRG 2	JRG 3	JRG 4
Condensed Matter & Field Theory	Multi-scale Modeling	String Theory	Cooperative Phenomena in Correlated Electron Systems
Leader: Dr. Xin Wan	Leader: Dr. Xin Zhou	Leader: Dr. Youngman Kim	Leader: Dr. Tetsuya TAKIMOTO
Since June 1, 2008	Since June 1, 2008	Since March 1, 2009	Since July 1, 2009

Group members: Leader, Postdocs, Guests, Ph. D students

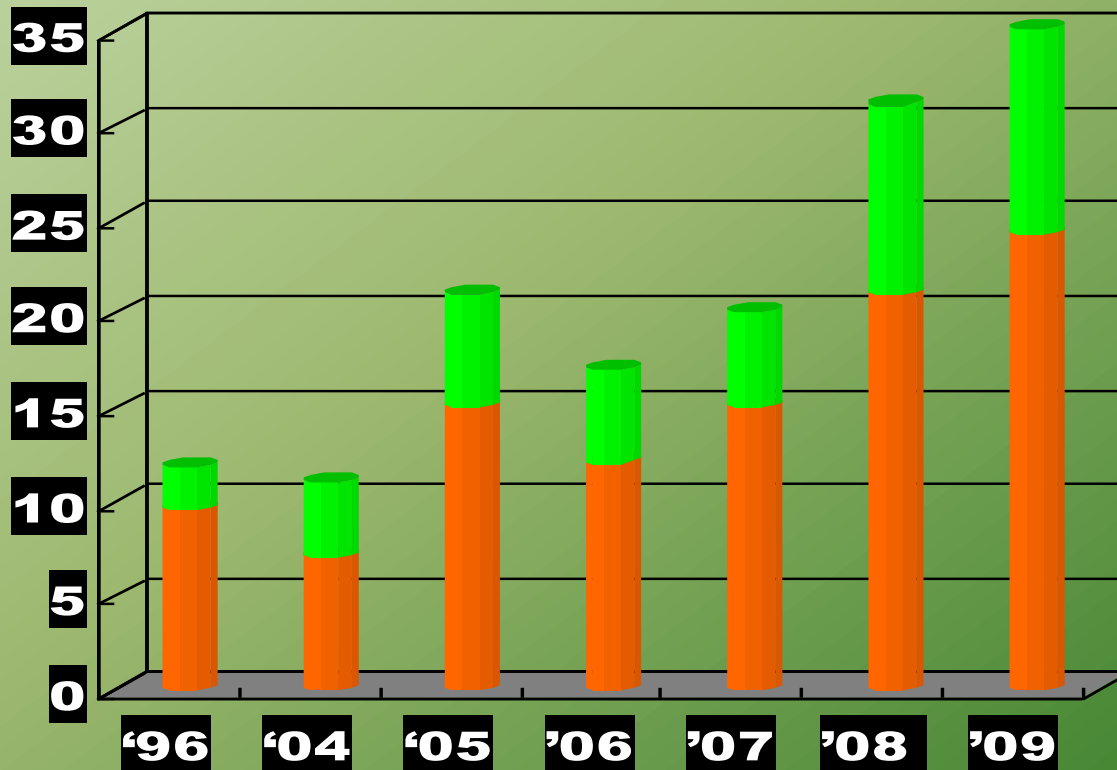
Note: Two JRG leaders are appointed and will start to operate their groups in May, 2010.
(Dr. G. Watanabe, Dr. H. Sahlmann)

Annual Budget



(Unit: 100 Million KRW)

Year	'96	'05	'06	'07	'08	'09	'10
Government	9.5	15	12	15	21	24.15	24.15
Other	2.3	6	5	5	10	10.85	10.55
Subtotal	11.8	21	17	20	31	35	34.7



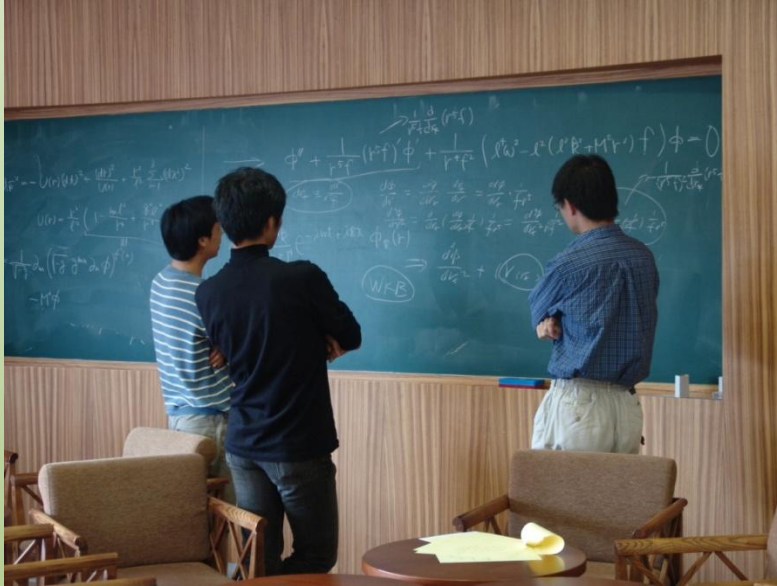
**€2.25 million
(\$3.5 million)**

Other
Government

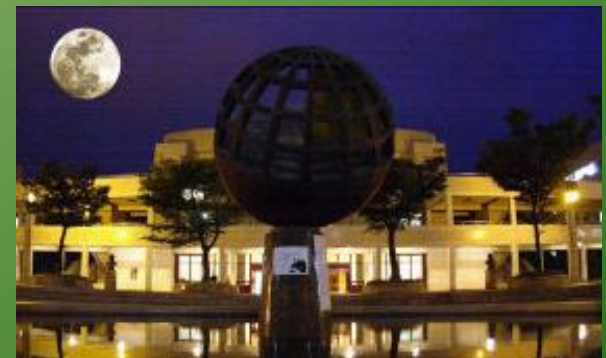
Environment



Environment



POSTECH Campus



Thank you.