
Physics

- What are areas of opportunity (in hadron imaging at JLab12 & EIC), for future synergetic cooperation between JLab and Korea (and more generally Asia-Pacific region)?

Practical steps

- How could US-JLab side contribute?
 - example of previous international cooperation (in hadron physics generally): GAUSTEQ (Germany-US Theory Exchange Program in QCD)
- How could Korean side contribute?
 - APCTP → *Yongseok Oh*

Discussion

Yongseok Oh
Kyungpook National University, Korea
Academic Coordinator, APCTP

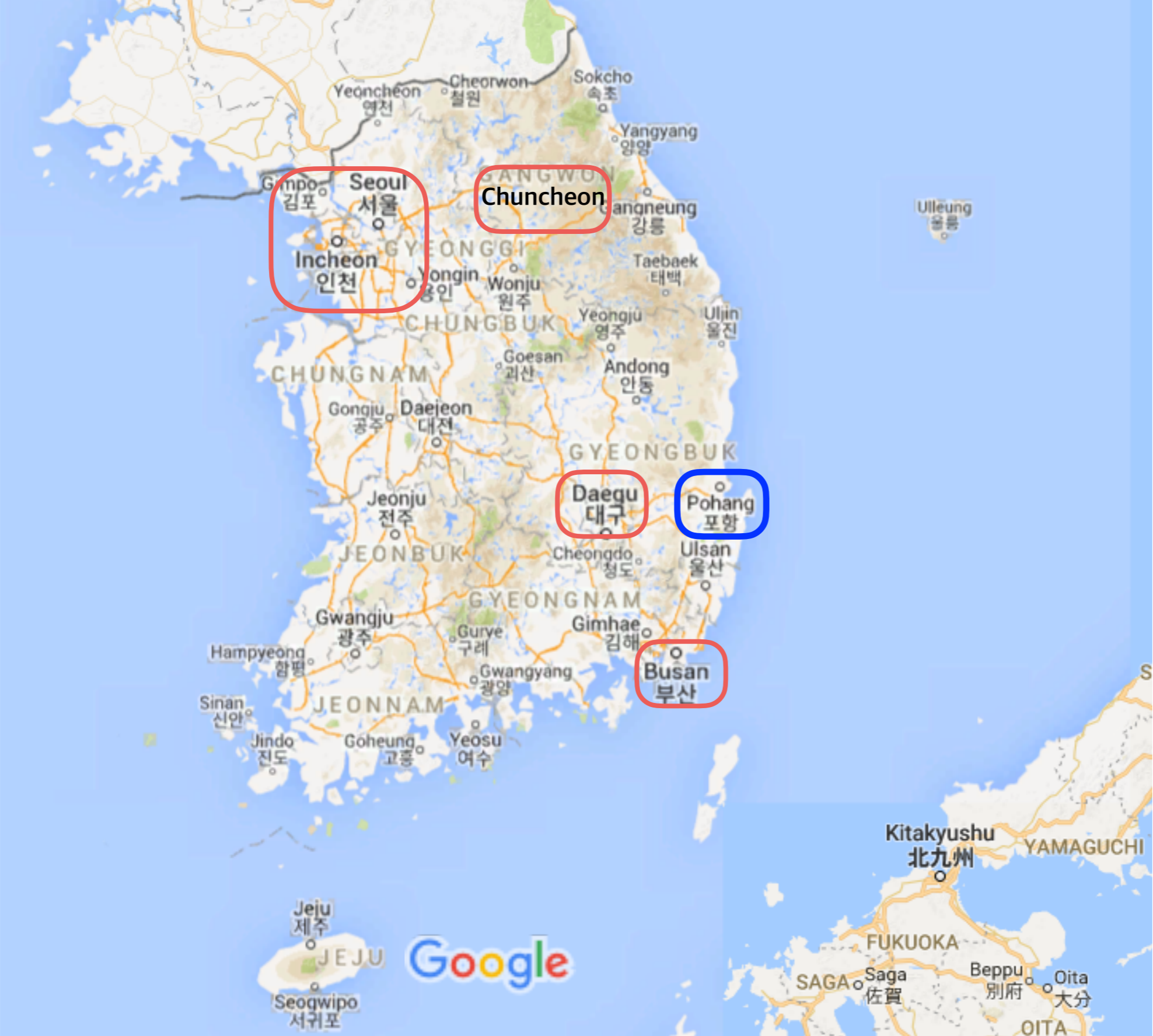
A light gray world map is centered in the background of the slide. A small red dot is placed on the Korean peninsula, indicating the location of the speaker or the center. The map shows the outlines of continents and major landmasses.

ASIA PACIFIC CENTER FOR THEORETICAL PHYSICS

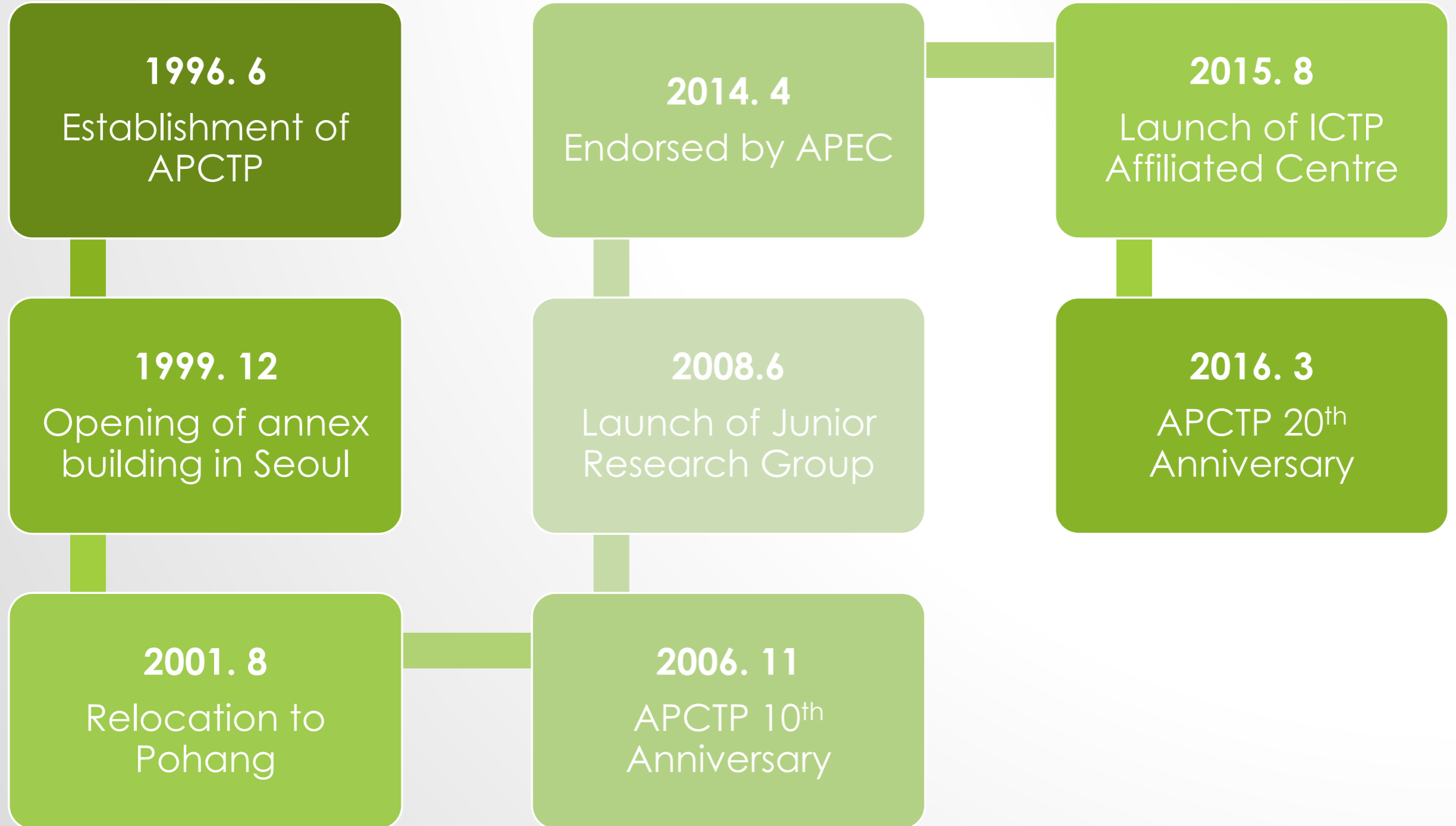
2017.11.2.-11.3., JLab.

Exploring Hadrons with Electromagnetic Probes: Structure, Excitations, Interactions

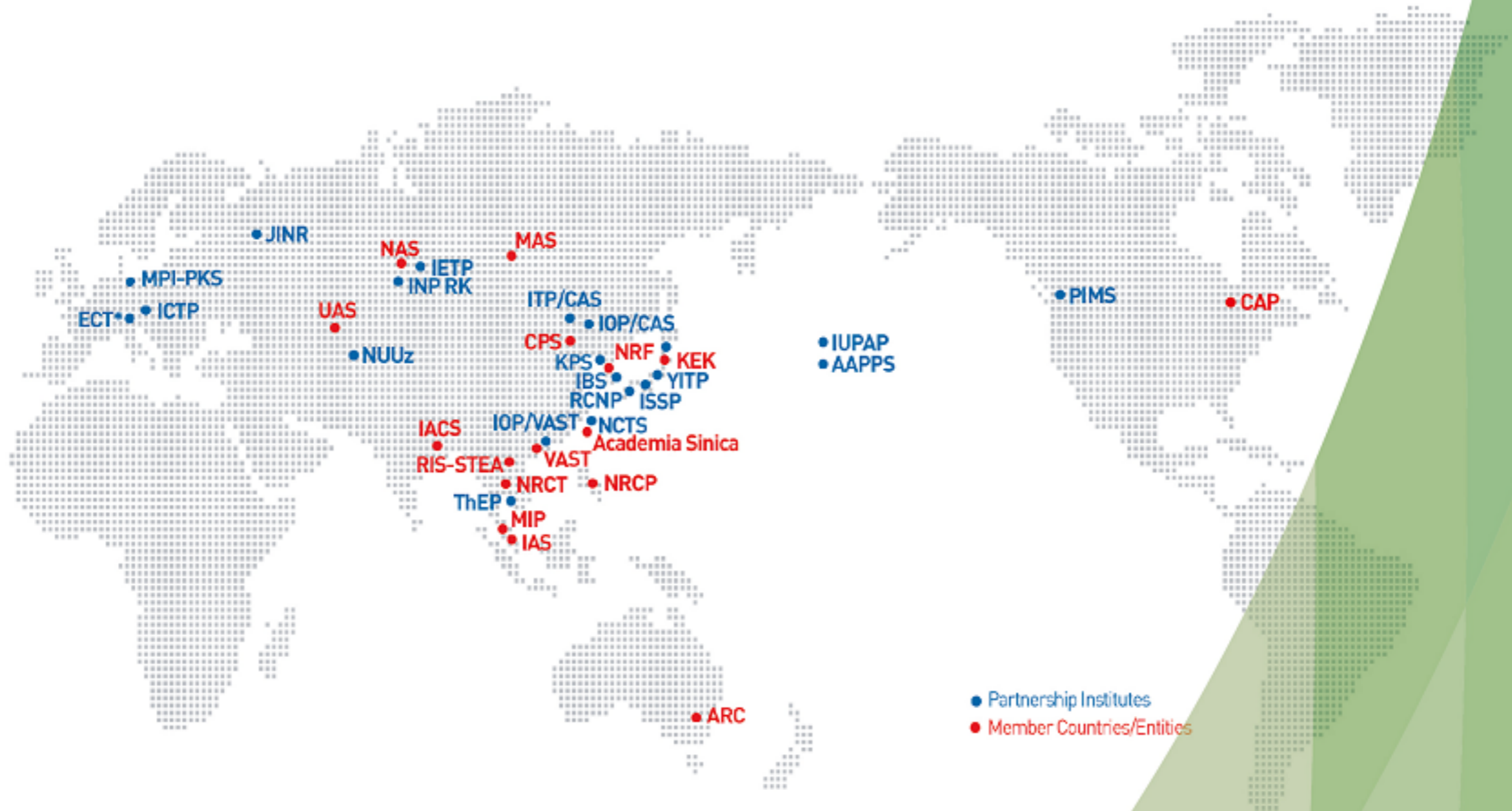
LOCATION



APCTP MILESTONES



MEMBER COUNTRIES & PARTNERSHIPS

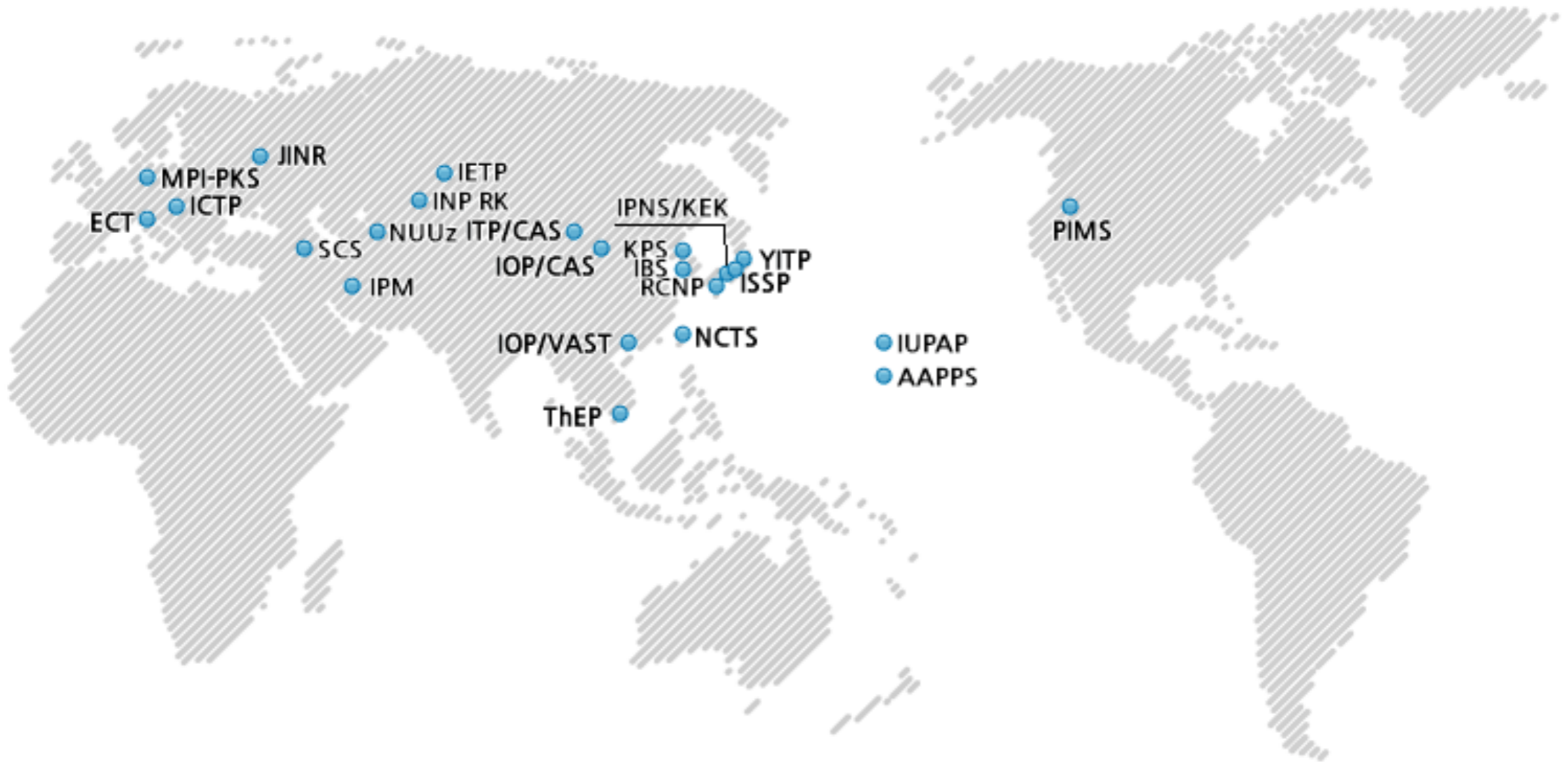


16 MEMBER COUNTRIES

First 10 member Countries

<p>Australia Australian Research Council (ARC)</p>	<p>Philippines National Research Council of the Philippines (NRCPP)</p>	<p>Thailand National Research Council of Thailand (NRCT)</p>	<p>India Indian Association for the Cultivation of Science (IACS)</p>
<p>Beijing Chinese Physical Society (CPS)</p>	<p>ROK National Research Foundation of Korea (NRF)</p>	<p>Viet Nam Vietnam Academy of Science and Technology (VAST)</p>	<p>Kazakhstan National Academy of Sciences of the Republic of Kazakhstan (NAS)</p>
<p>Japan Institute of Particle and Nuclear Studies, KEK (IPNS/KEK)</p>	<p>Singapore Institute of Advanced Studies (IAS)</p>	<p>Uzbekistan Uzbekistan Academy of Sciences (UAS)</p>	<p>Lao PDR The Research Institute of Science, Science Technology and Environment Agency (RIS-STEPA)</p>
<p>Malaysia Malaysia Institute of Physics (MIP)</p>	<p>Taipei Academia Sinica (AS)</p>	<p>Canada Canadian Association of Physicists (CAP)</p>	<p>Mongolia Mongolian Academy of Sciences (MAS)</p>

PARTNERSHIP INSTITUTIONS



LEADERSHIP

President



1. Chen-Ning Yang
1997-2000

Nobel Laureate
in Physics, 1956



2. Robert B. Laughlin
2004-2007

Nobel Laureate
in Physics, 1988



3.4. Peter Fulde
2007-2013

Emeritus
Director of MPI-
DKS



5. Seunghwan Kim
2013-2014

Physics Professor
of POSTECH



6. Bum-Hoon Lee
2015-2016

Physics Professor
of Sogang Univ.



W. Namgung
2016-

Acting President

Chairperson



1. Chen-Ning Yang
1997-2000

Nobel Laureate
in Physics, 1956



2. A. Arima
2001-2005

Former Minister
of Education of
Japan



3. Van Hieu Nguyen
2005-2010

Former President
of NCST



4. W. Namgung
2010-2013

Physics Professor
of POSTECH



5. Paul A. Pearce
2013-2016

Physics Professor
of Univ. of
Melbourne



6. W. Namgung
2016-

Physics Professor
of POSTECH

MISSION

We aim to advance physics in the Asia Pacific region.

As such, main functions of the APCTP are:

In-house Research Regional Cooperation

- Junior Research Group (JRG)
- Young Scientist Training Program (YST)

- External Activity
- AP Basic Science Cooperation Forum



Academic Activity Hub

- Conference/Workshop/School
- Topical Research Group (TRP)



Research Programs

Junior Research Groups (JRG)

We collectively support and fund outstanding mid-career physicists' inspirational ideas and their research projects. Each JRG leader can organize a research group and run it independently. All JRGs have successfully achieved their best research results with noticeable contributions to the physics community and beyond.

Young Scientist Training Program (YST)

With the stimulating and active scientific environment, we give an opportunity to young promising physicists (scientists) from the Asia-Pacific region to increase their research capability.

Visitors Program

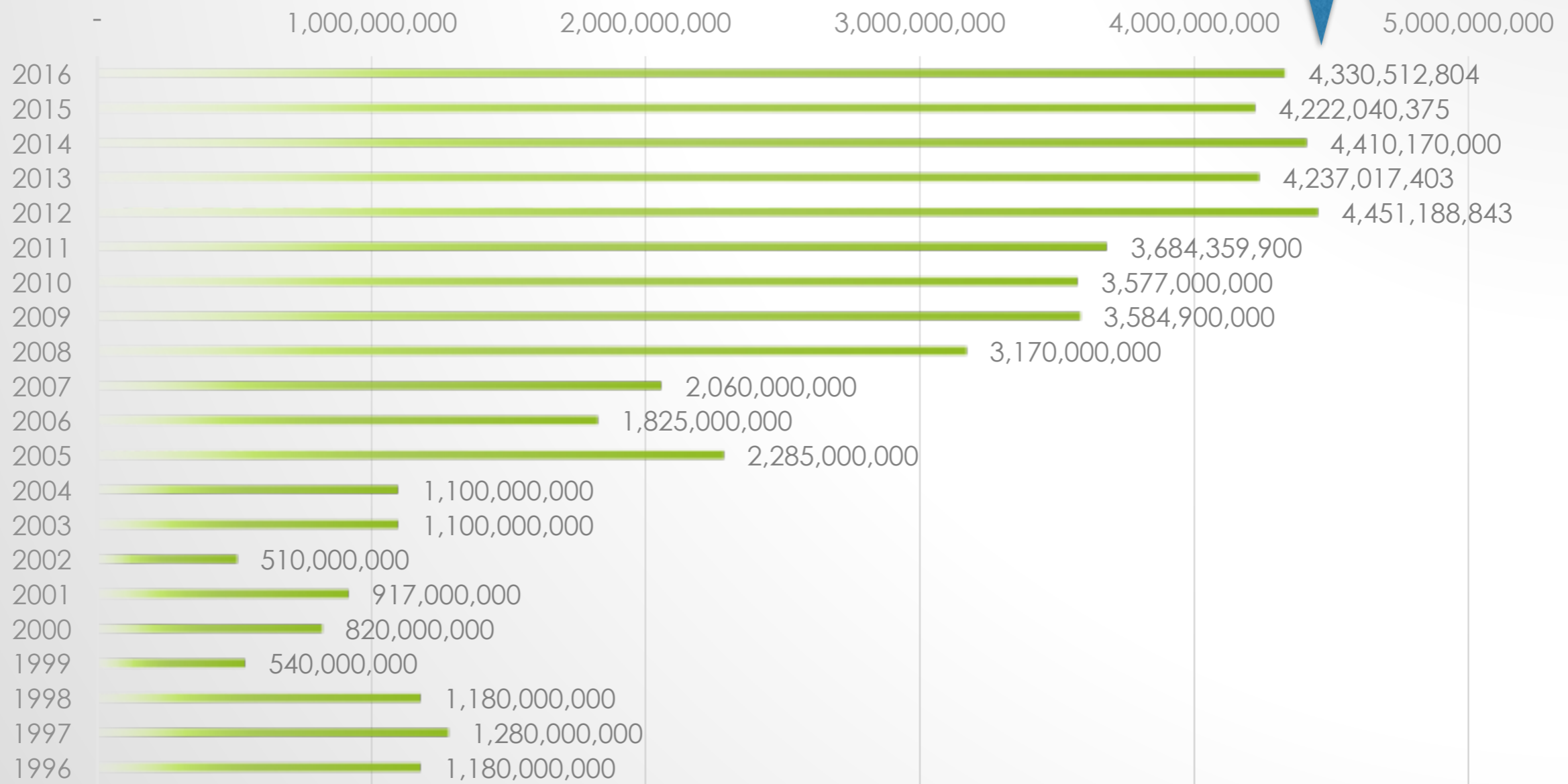
We strongly encourage short and long-term visits by researchers or small groups from the Asia Pacific regions as well as world-class scholars.

ANNUAL BUDGET STATUS

~3.6M USD



Unit: KRW



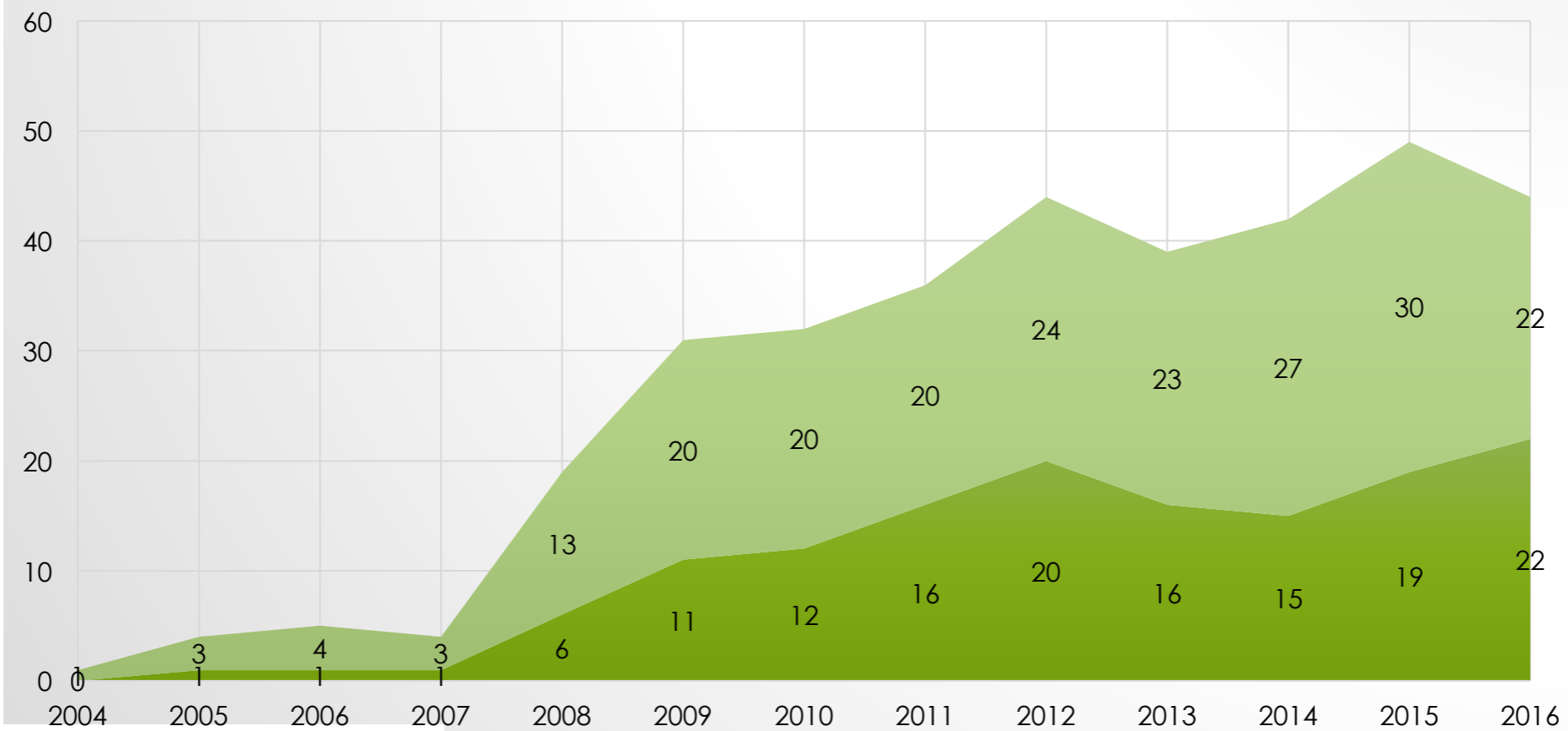
Budget

1USD = 1,200 KRW

IN-HOUSE RESEARCHERS IN NUMBER – JRG & YST

■ Korean ■ Non-Korean

Unit: # of researchers



Scientific Activities

Academic Programs

Designed to initiate international research activities through conferences, workshops and schools. These short-term activities include joint programs with institutions under cooperation agreements & external activities held in member countries and regions.

Focus Research Programs

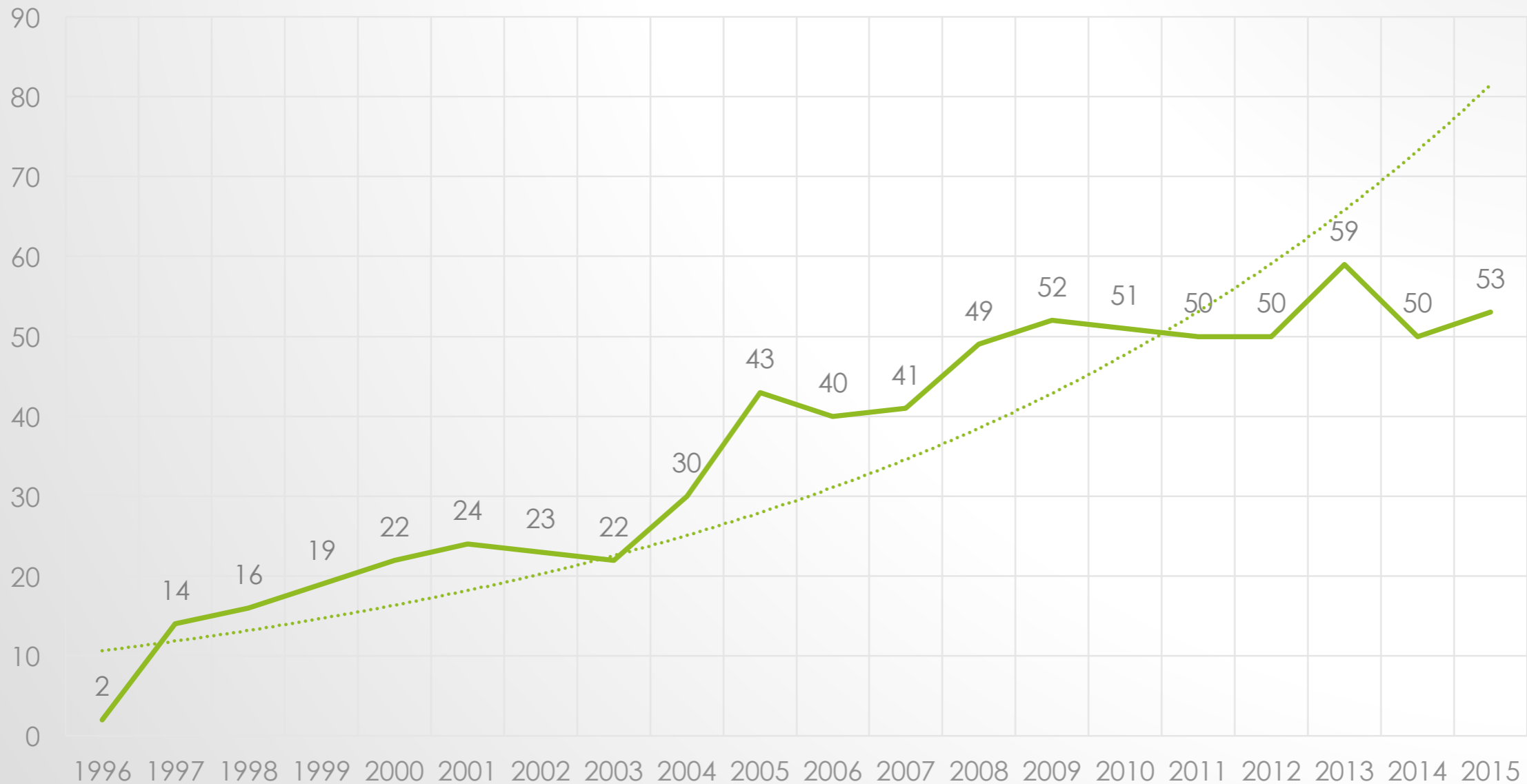
These are intensive research programs from two weeks to several months for focused research and discussions on recent hot topics.

Physics Outreach Programs

We carry out diverse science-culture activities to communicate with the general public and strengthen scientific ties among scientists in the region.

ACADEMIC PROGRAMS IN NUMBER

Unit: # of programs



APCTP
Asia Pacific Center for Theoretical Physics

2017 APCTP Scientific Activity Calendar



JANUARY

- 14th KIAS-APCTP Winter School on Statistical Physics (2017-01-09~01-13 / High1 Resort, Jeongseon)
- 21st APCTP Winter School on Fundamental Physics (2017-01-19~01-25 / APCTP HQ, Pohang)

FEBRUARY

- Computational Neuroscience Winter School (2017-02-06~02-10 / PIC, Pohang)
- Quantum Materials Symposium 2017 (2017-02-19~02-24 / Yongpyong Resort, Pyeongchang)

MARCH

- Spring School on Superstring Theory and Related Topics (2017-03-16~03-24 / ICTP, Trieste, Italy)

APRIL

- Frustrated Magnetism (2017-04-03~04-12 / Chennai-Tamil Nadu, India)

MAY

- The 6th School of Mesoscopic Physics: Electron correlations in Quantum Devices (2017-05-25~05-27 / PIC, Pohang)

JUNE

- Nuclear Physics School 2017 (2017-06-19~06-23 / APCTP HQ, Pohang)
- 2017 Summer School on Numerical Relativity and Gravitational Waves (2017-06-25~06-30 / Hongik Univ., Seoul)
- Biophysics School (2017-06-26~06-28 / APCTP HQ, Pohang)
- The 19th International Conference on Recent Progress in Many-Body Theories (2017-06-25~06-30 / PIC, Pohang)

JULY

- ICTP-ICGEB-APCTP joint workshop on systems biology and molecular economy of microbial communities (2017-07-03~07-07 / ICTP, Trieste, Italy)
- International Conference on Relativistic Quantum Information North 2017 (RQI-N 2017) (2017-07-04~07-07 / YITP, Kyoto, Japan)
- International Symposium on Recent Progress in Superconductivity (2017-07-05~07-07 / Yongpyong Resort, Pyeongchang)
- International Workshop for String Theory and Cosmology 2017 (2016-07-05~07-07 / Hanyang Univ.)
- 11th APCTP-BLTP JINR Joint Workshop (2017-07-25~07-30 / Saint-Petersburg, Russia)

AUGUST

- APCTP-CTPU-GSDC 2017 LHC Physics Workshop @Korea (2017-08-01~08-03 / Konkuk Univ., Seoul)
- The 9th Conference of the Asian Consortium on Computational Materials Science (ACCMS-9) (2017-08-08~08-11 / Kuala Lumpur, Malaysia)
- Physics and Applications of Nanoelectronic and Nanomechanical Systems (2017-08-28~08-30 / Yongpyong Resort, Pyeongchang)
- Workshop on Quantum Magnetism (2017-08-28~08-30 / APCTP HQ, Pohang)
- Geometry and Holography for Quantum criticality (2017-08-21~08-29 / APCTP HQ, Pohang)
- 15th International Conference on Squeezed States and Uncertainty Relations (2017-08-28~09-01 / Jeju Island)
- Tensor Network States (2017-08-21~08-23 / Hongik Univ., Seoul)
- Summer Institute 2017-Phenomenology of Elementary Particles and Cosmology (2017-08-25~08-31 / Fuji-Yoshida, Japan)

SEPTEMBER

- Fields and Space-Time Dynamics by Discrete Method (2017-09-18~09-24 / APCTP HQ, Pohang)
- International Workshop on Short-time Dynamics in Novel Superconductors and strong spin-orbit coupled systems (2017-09-18~09-22 / IBS, Daejeon)

OCTOBER

- 9th IACS APCTP Joint Conference on Novel Quantum Phases in Oxide Materials and Low Dimensional Systems (2017-10-04~10-06 / IACS Kolkata & IIT Bombay, Mumbai, India)
- The 9th APCTP Workshop on Multiferroics (2017-10-06~10-09 / Osaka Univ., Toyonaka, Japan)
- International workshop "New aspects of the Hadron and Astro/Nuclear Physics" (2017-10-10~10-14 / Tashkent, Uzbekistan)

NOVEMBER

- The 20th Asian Workshop on First-Principles Electronic Structure Calculations (2017-11-06~11-08 / Nanjing Univ., Jiangsu, China)

DECEMBER

- Liouville, Integrability and Branes (13) (2017-12-08~12-17 / APCTP HQ, Pohang)

- Programs held in Korea
- Programs held outside Korea

PARTICLE PHYSICS

- String Theory and Cosmology
- BSM Physics in the post Higgs era

STATISTICAL PHYSICS / COMPLEX SYSTEMS

- Statphys Monthly Meeting
- Physics in Economic and Social System
- Discussion Meeting on Polymer Physics Theory
- Innovative Workshop on Soft/Bio Materials

ASTROPHYSICS / NUCLEAR PHYSICS

- The origin and evolution of the Universe
- Every corner of QCD phase diagram
- Gravity and Cosmology
- Understanding of the hadrons in various environments

APCTP Asia Pacific Center for Theoretical Physics

<http://apctp.org> Email: sec@apctp.org
Headquarters (Pohang) Tel 8254279.8661~5 Fax 8254279.8679
Branch Office (Seoul) Tel 822561.7641~2 Fax 822561.7140

Activities in Nuclear Physics

Nuclear Physics Summer School (since 2003)

ECT*-APCTP International Workshop

2004: New Approaches to the Nuclear Many-Body Problem

2015: From Rare Isotopes to Neutron Stars

HIM (Heavy Ion Meeting) (since 2005)

focused on relativistic heavy ion physics

ATHIC (Asian Triangle Heavy Ion Conference) (since 2006)

China-Japan-Korea Joint Conference on the relativistic heavy ion physics

APCTP-BLTP JINR Joint Workshop (since 2007)

2007: Dubna, 2008: Pohang, 2009: Dubna, 2010: Pohang, 2011: Dubna,

2012: Pohang, 2013: Baikal Lake (R), 2014: Jeju Island (K), 2015: Kazakhstan,

2016: RIKEN (J), 2017: St. Petersburg (R)

Hanyang Univ. WCU - APCTP Focus Program (2010-2013)

Mannque Rho, Hyun Kyu Lee, Youngman Kim

HaPhy (Hadron Physics) (since 2011)

focused on hadron physics

Activities in Nuclear Physics (2018)

under examination

- ☑ HaPhy (Hadron Physics): 2-3 meetings a year
- ☑ HIM (Heavy Ion Meeting): 2-4 meetings a year

- ☑ Nuclear Physics Summer School: June 25-29, Pohang
- ☑ APCTP Workshop on JLab Physics: July 2-6, Pohang/Gyeongju
The Nature of Hadron Mass and Quark-Gluon Confinement from JLab Experiments in the 12-GeV Era (Organizers: V. Mokeev, Cheung Ji, et al.)

- ☑ APCTP-BLTP JINR Joint Workshop: Aug. 20-25, Busan
- ☑ NuSYM2018 (8th Int. Symposium on Nuclear Symmetry Energy) :
Sep. 10-13, Busan
- ☑ APCTP-TRIUMF Joint Workshop: Sep. 14-19, Pohang
Skyrmions and the Skyrme force (density functional theory on nuclear matter)

Junior Research Group

- **Initiated by the cooperation with MPI, Germany.**
- **Group leader + Group members (2-3 postdocs and/or grad. students of POSTECH)**
- **Group leader**
 - **5-year position for outstanding mid-career physicists in theory**
 - **selected by the selection committee each year based on the excellency in research in the whole area of theoretical physics**
 - **currently, 8 groups are running**
 - **duty: to conduct independent research by organizing his/her own group**
- **Group leaders and postdocs are eligible to apply for a research fund to NRF (National Research Foundation of Korea)**

Junior Research Group



Dong-Han Yeom

Classical and Quantum
Theory of Gravity



Eoin O Colgain

Supergravity and
String Theory



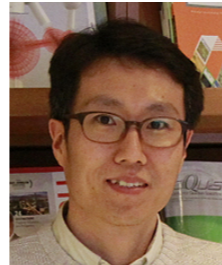
Chanyong Park

Gauge/Gravity Duality
and String Theory



Hang-Hyun Jo

Statistical Physics of
Complex Dynamics



Jaeyoon Cho

Quantum Information
and Many-Body



Alireza Akbari

Many-Body Theory
and Correlated

- 2 more JRG leaders were selected and their groups will be launched soon.
- APCTP wants to have 10 JRG.
- Until now, there was only 1 group in Hadrons & Nuclei:
String Theory in Strongly Interacting Systems by Youngman Kim (2009 - 2012)



THANK YOU