

## RCNP 研究会報告

### 1) 研究会タイトル、実施期間と場所

Hadron Nuclear Physics 2017 (HNP17)

2017年12月18日-22日(5)日間、理化学研究所

### 2) 研究会のテーマと、その説明、内容

この研究会は1999年にRCNPで開催された、RCNPとプサン大学との共同研究集会から始まった。今回は11回目で、現在はほぼ日中韓の持ち回りで2年ごとに行ってきた。ハドロン物理と原子核物理では共通する概念と手法を多数分け合うことから、双方の交流を図っている。若手の講演を推奨し多くの機会を与え、次世代を担う人材育成の機会としての役割も目指した。今回はSNPスクールと連続して行ったため、多くの若手参加者が両方に参加し、彼らにとって有益な研究会、およびスクールとなった。

個別テーマは、ハドロン原子核のテーマのほか、重力波の発見にちなんでその関係の講演も4件行った。また最近進展の著しい冷却原子とユニバーサリティー関連の話も2件行った。

### 3) 参加人数

合計101名、内国内42名、国外59名。また若手としては大学院生26名、ポスドク15名。

### 4) 予算の内訳

APCTPから802,656円、理研から50万円、RCNPからは304,600円。したがってRCNP予算が占める割合は20%弱。RCNP予算は若手のサポートに充当(国外参加者は宿泊滞在の実費、国内参加者は交通費と宿泊滞在の実費)。

希望予算40万円を使い切らなかった理由は、自らの財源使用を積極的に呼びかけたところ、多くの参加者が応じてくれたため。

参考のためAAPPSのレポートに掲載される記事を添付いたします。

以上、文責：保坂 淳

# Reports from SNP school and HNP workshop

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## ABSTRACT

An international school and workshop for hadron and nuclear physics were held in December 2017, in Tokai and Wako, Japan, as endorsed by ANPhA, the nuclear physics division of the AAPPS. Both of them are international activities that have attracted many Asian young physicists every either one or two years. We hope that these will be regular activities driven by Asian countries to encourage and promote young physicists in the future.

## Introduction

Recently, there are many opportunities to meet and present research achievements in various conferences and workshops. Among them, the events reported here are unique in that they are intended to provide chances for young physicists. The idea matches precisely the aim of the funding agencies including APCTP, RCNP, J-PARC and so on [1,2]. The SNP school was held in December 14 - 16, and the HNP workshop in 18 - 22. In fact, there was also another workshop, REIMEI, held at JAEA, Tokai, 11 - 12. Therefore, the two weeks Dec. 11 - 22 are exclusively for the meetings in the Kanto area of Japan, for hadron and nuclear physics. So far, the two activities SNP and HNP were organized independently, but this time we tried to merge them under the strong support from APCTP. Consequently, the two events have been successfully held with more participants than we expected from the previous ones. As the data summarized in Table 1 and 2 shows, there are many young participants from various countries around Asia.

## SNP school

The school on the strangeness in Nuclear Physics (SNP) is the series of an international school which started in 2012, at J-PARC and Tohoku University in Japan. The subjects of the school have been those of hypernuclear

Table 1: Countries where participants are from.

Countries	SNP	HNP	Both	Total
China	7	27	6	34
Germany	4	4	2	8
India	2	2	2	4
Indonesia	1	1	1	2
Japan	33	42	9	75
Kazakhstan	1	1	0	2
Malaysia	1	0	0	1
Korea	3	12	3	15
Russia	2	2	2	4
Spain	0	1	0	1
Switzerland	1	1	1	2
Thailand	3	5	3	8
Turkey	0	1	0	1
Uzbekistan	1	1	1	2
Vietnam	1	1	1	2
USA	2	0	0	2
Total	62	101	31	163

Table 2: Number of young participants.

Young participants	SNP	HNP	Both	Total
Students	34	26		60
Postdocs	2	15	2	17
Total	36	41	13	77

physics and related topics in hadron-nuclear physics.

Hypernuclei are atomic nuclei containing strange quarks, which are the third species of quarks following the up and down quarks. It does not appear in ordinary matter but will show up in extremely dense matter, or it will be artificially produced with particle accelerators on the earth. Physics of hypernuclei enjoys many important issues of modern physics such as high precision baryon interactions studied experimentally by accelerators and theoretically by high

performance supercomputers, which is the latest subject of Quantum Chromodynamics (QCD) for the strong interaction. Recently, it also has strong contact with hadron physics of exotic natures with heavy quarks such as charm and bottom quarks, and with few-body physics in relation with universal physics which is recently actively developed in the field of cold atoms.

Having this scope, this time we have invited four lecturers, K. Hicks (Ohio, Experimental studies of Hadron Structures), T. Hyodo (Kyoto, Lambda(1405) and KN interaction), C. Green (Purdue-Madison, Cold atoms), T. Saito (GSI, Hypernuclear physics with heavy ion beams), and B. Balantekin (Wisconsin-Madison, Particle physics and astrophysics). We had also a facility tour to J-PARC, and young scientist session. Excellent presentations were then awarded prizes, Hashimoto/ANPhA 1st and SNP incentive/ANPhA 2nd prizes.

## HNP workshop

The workshop on Hadron and Nuclear physics (HNP) originally started as a collaboration meeting between RCNP, Osaka Univ. and Pusan National Univ, and had continues as a medium size workshop between Korea and Japan. In 2009, from the one held in Kizu Japan, we expanded the scale as to invite more from Asian countries. The number of participants has been typically 50 - 100, no more than that, but this time we had around 100 participants. The philosophy of this workshop is to encourage young people to participate and discuss readily. Latest topics are also arranged as

presented by the leading researchers. Observing the similar ideas and methods in hadron physics and nuclear physics, all contributions are allotted as oral nested in a flexible manner in plenary sessions as much as possible. In this way participants can communicate for the latest status of the relevant research fields.

This time, as combined with the SNP school, topics related to strangeness hadron nuclear physics, exotic hadrons, nuclear structure with multi-nucleon correlations and recent progresses in cold atoms were particularly discussed. In addition, as the important development in physics 2017, we have invited several speakers for the gravitational wave and its relevance to astrophysics and hadron-nuclear physics.

## Summary

The combined organization of the two activities of the SNP school and HNP workshop was quite successful, and have given an impact on the young participants. Research activities like this should be important to keep the scientific achievements in Asian countries, and we wish to continue them under the support of AAPPs and its related organizations.

## References

- [1] Web site of SNP school;  
<http://www.rcnp.osaka-u.ac.jp/~snp2017/index.html>
- [2] Web site of HNP workshop;  
<https://indico2.riken.jp/indico/conferenceDisplay.py?confId=2540>

## SNP School



Awards



Posters



## HNP Workshop

