

International KEK-Cosmo and APCosPA Winter School 2019

Primordial Black Hole

22nd – 24th January 2019
Theory Center, IPNS, KEK, Oho 1-1, Tsukuba 305-0801, Japan



Photo by Hiroko Tada



Credit: KEK Student Program 2018

After aLIGO detected the gravitational wave (GW) produced by mergers of binary black holes (BHs), researchers have aggressively studied the origin of the BHs with masses of the order of $O(10) M_{\odot}$. In addition to astrophysical origins of BHs, one of the attractive candidates of those massive BHs should be Primordial Black Holes (PBHs), which were produced in the early Universe, e.g., through collapses of large curvature perturbation at small scales produced by inflation, not through normal collapsing stars. In addition to the candidates of the sources for the GW events, it is exciting that PBHs can be also whole or in part of dark matter. Therefore, nowadays PBHs have become common topics to be studied in astrophysics, cosmology and particle physics.

So far a variety of researches on PBHs have been reported within a couple of years. For students and young postdocs, it should have been a challenging task to catch up with recent topics related with PBHs. Therefore, we organize this school to study the current status of PBHs.

We ask each lecturer to cover both basic topics and cutting-edge researches. The number of audiences will be restricted due to the limited size of lecture rooms. The lecturers can use white boards as well as projectors, although we may ask the lecturers to mainly give white-board lectures, as these are easier for audiences to digest, in particular with regard to equations.

Topics to be discussed

- 1) Mechanisms for Formations of PBHs
- 2) Cosmological scenarios to produce PBHs
- 3) Observational constraints on PBHs
- 4) Astrophysical Black Holes

Invited speakers include:

Tomohiro Harada (Rikkyo U, Japan), “Mechanisms for Formations of PBHs”
Teruaki Suyama (Tokyo Tech, Japan), “Cosmological formation rates of binary PBHs”
Ryuichi Takahashi (Hirosaki U, Japan), “Gravitational Lensing and BHs”
Kohei Inayoshi (Peking U, China / Columbia U, USA), “Pop.III / II stars and binary BH formations”

Program

<http://research.kek.jp/people/kohri/program2019.htm>

Workshop attendees:

Aimed at graduate students, and postdocs and junior faculties

Workshop fees

Reception: 1,000 yen

Drinks and snacks: 300 yen

Deadline for the registration

21st December 2018

Registration form and application form for wifi

<http://research.kek.jp/people/kohri/registrationKEKCosmo2019.htm>

Covering lodging expenses

We cover lodging expenses for participants who stay at the KEK dormitory on campus. If you need the support, email to the secretary with writing your detailed schedule, please.

Inquiries:

Ms. Tomoko Numata, Secretary, Theory Center, IPNS, KEK
tomokon-AT-post.kek.jp

Venue:

Room 3 on the ground floor at Kenkyu-Honkan Building on the KEK Tsukuba campus.

<http://www.kek.jp/en/CometoKEK/>

SOC

Kazunori Kohri (KEK, Chair)
 Kunihiro Ioka (YITP, Kyoto U)
 Satoshi Iso (KEK)
 Masahiro Kawasaki (ICRR, U Tokyo)
 Ryuichiro Kitano (KEK)
 Koutarou Kyutoku (KEK)
 Takahiko Matsubara (KEK)
 Mihoko M. Nojiri (KEK)
 Yuuiti Sendouda (Hirosaki U)
 Jun'ichi Yokoyama (RESCEU, U Tokyo)
 Chulmoon Yoo (Nagoya U)

LOC

Kazunori Kohri (KEK, Chair)
 Takuya Hasegawa (KEK)
 Nagisa Hiroshima (ICRR, U Tokyo / KEK)
 Takafumi Kokubu (Rikkyo U)
 Koutarou Kyutoku (KEK)
 Takahiko Matsubara (KEK)
 Taro Mori (KEK)
 Takahiro Terada (KEK)
 Sai Wang (KEK)

http://www2.kek.jp/theory-center/theory_e/about-the-center/

Our project and past workshops / schools:

<http://research.kek.jp/people/kohri/project2016E.html>

Sponsors:

The Asia Pacific Center for Theoretical Physics (APCTP) program Category-4

The KEK Project Research Grant 2018

The KEK Student Program 2018

The JSPS grant (Kiban A) “21cm line observations and future astrophysics”
 (JP17H01131)

The MEXT grant “Leading Initiative for Excellent Young Researchers (LEADER) ”

The MEXT grant (open applications) on Innovative Area “Theoretical researches to observe Primordial Black Holes” (JP18H04594)

The MEXT grant on Innovative Area “The origin for the accelerated expansion of the Universe” A02 (JP15H05889)

Endorsed by

Division of Astrophysics, Cosmology, and Gravitation (DACG), Association of Asia Pacific Physical Societies (AAPPS)

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