

KEK-Cosmo 2017 Workshop

Fundamental Physics in the Universe

20th – 22nd February 2017

Theory Center, KEK, Tsukuba, Japan



Experiments at the Large Hadron Collider (LHC) of CERN have revealed the existence of the Higgs boson. This discovery marks the completion of the Standard Model (SM) of particle physics, making the search for theories beyond the SM more compelling than ever. Notably, the need for such extensions is linked to the failure of the SM to explain a number of astrophysical and cosmological observations: 1) the origin of matter-antimatter asymmetry, 2) the origin of neutrino masses, 3) the nature of dark matter, 4) the nature of the inflaton field, and 5) the nature of dark energy. In addition, quite recently "the Higgs stabilization problem" has been identified: fluctuations of the Higgs field produced during the cosmic evolution may destabilize the Higgs field itself.

In order to elucidate the above issues, interdisciplinary research combining elements of particle physics, astrophysics and cosmology will be of great importance. In this school, we invite experts of research in these fields and ask them to give a series of lectures.

We ask each lecturer to cover both basic topics and cutting-edge research. The audience will be fewer than 30 people 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 audience members to digest, in particular with regard to equations.

Topics to be discussed

- • Cosmological perturbations and future observations

- New physics in neutrino cosmology
- Dark matter and future experiments
- Gravitational wave

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

Invited speakers

- Steen Hannestad (Aarhus, DK), “Neutrino cosmology”
- Ayuki Kamada (IBS, Korea), “Dark matter theory”
- David Seery (Sussex U., UK), “Cosmological perturbations in the inflationary Universe”
- Pasquale D. Serpico (LAPTH, France), “Dark matter and cosmic rays”
- Alberto Sesana (U. of Birmingham, UK), “Gravitational wave from astrophysical sources”

Program

<http://cosmophysics.kek.jp/program2017.pdf>

Workshop attendees:

Aimed at graduate students, postdocs and junior faculties

Workshop fees

Reception: 1,000 yen

Drinks and snacks: 300 yen

Dead line for the registration

20th January 2017

Registration form and application form for wifi

<http://cosmophysics.kek.jp/registrationKEKCosmo2017.pdf>

Covering travel expenses

We cover travel expenses only for some participants. If you need the support, email to the secretary with writing your detailed schedule, please.

Inquiries:

Ms. Michiyo Sakurai, Secretary, Theory Center, IPNS, KEK

michiyo-AT-post.kek.jp

Venue:

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

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

SOC

Kazunori Kohri (KEK, Chair), Motoi Endo (KEK), Satoshi Iso (KEK), Ryuichiro Kitano (KEK), Koutarou Kyutoku (RIKEN, Vice-chair), Mihoko M. Nojiri (KEK), Jonathan White (KEK)

LOC

Kazunori Kohri (KEK, Chair), Takuya Hasegawa (KEK), Nagisa Hiroshima (KEK / U. Tokyo), Koutarou

Kyutoku (RIKEN, Vice-chair), Taro Mori (KEK), Jonathan White (KEK)

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

Sponsor:

The MEXT grant “Leading Initiative for Excellent Young Researchers (LEADER)” (文科省卓越研究員事業), The KEK Project Research Grant, The H28 Sokendai International Cooperation Grant (H28総研大国際連携推進事業), The MEXT grant 新学術領域研究公募研究「宇宙観測によるニュートリノの絶対質量の決定」(JP16H00877), The MEXT grant 新学術領域研究「なぜ宇宙は加速するのか? - 徹底的究明と将来への挑戦 -」(JP15H05889)