

# SEARCHING FOR GALACTIC AXIONS AND SUPERCONDUCTING DEVICES WITH QUANTUM EFFICIENCY

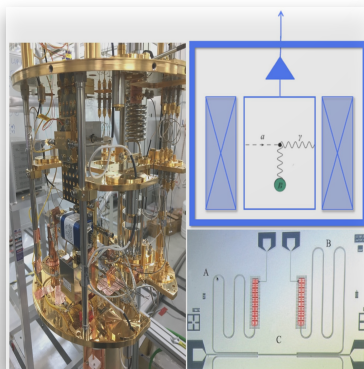
## INTERNATIONAL WORKSHOP

### October 25 — 29, 2021

Two extremely challenging scientific problems have fascinated scientists for the last two decades: the mystery of dark matter, in particular, the detection of Axions in our Universe, and the development of large quantum (qubits) networks allowing to establish the quantum information technology on the macroscopic level and to measure weak electromagnetic signals with unprecedented precision. To observe the dark matter Axions in the Axion Dark Matter eXperiment (ADMX) one has to be able to detect single microwave photons with high efficiency. The quantum networks of interacting superconducting qubits showing coherent quantum dynamics on macroscopic scale, provide a feasible, though still extremely challenging, approach towards developing a microwave single photon detector. The workshop aim is to bring together world leading scientists and young researchers representing different groups through over the world working in the fields of searching dark matter Axions, study of superconducting quantum networks and application of superconducting qubit networks in quantum metrology. This International Workshop will be an important step in order to develop and realize quantum photon detectors capable to detect weak electromagnetic signals expected from the presence of Axions in the galaxy.

#### Topics include:

- ▶ Physics of Dark Matter Axions
- ▶ Axion-Dark Matter Experiment
- ▶ Josephson junctions amplifiers
- ▶ Non-classical states of photons
- ▶ Superconducting quantum networks
- ▶ Quantum sensing with superconducting qubits
- ▶ Quantum sensing: magnetic clusters, ion trapping



#### Invited Speakers

Marco Affronte (Italy)  
Giorgio Brida (Italy)  
Woohyun Chung (Korea)  
Claudio Gatti (Italy)  
Pertti Hakonen (Finland)  
Fabian Hassler (Germany)  
Evgeni Il'ichev (Germany)  
Alexandre Karpov (Russia)  
Bela Majorovits (Germany)  
Mikko Möttönen (Finland)  
Andrey Pankratov (Russia)  
Yuri Pashkin (UK)  
Gray Rybka (USA)  
Michael Tobar (Australia)  
Alexey Ustinov (Germany)  
Sergey Uchaikin (Korea)  
Andreas Wallraff (Switzerland)  
Alexandre Zagorin (UK)

#### Scientific Coordinators

Mikhail Litsitskiy (Italy)  
Mikhail Fistul (Germany)  
Yannis Semertzidis (Korea)

#### Organizers

Gileun Lee (Korea)  
Jaehee Kwon (Korea)

To apply for participation in the Workshop, complete the online application form by **October 2, 2021**. This workshop will be organized by the virtual conference platforms. For further information, see [pcs.ibs.re.kr](http://pcs.ibs.re.kr) or contact the PCS Visitor Program at [pcs@ibs.re.kr](mailto:pcs@ibs.re.kr)

#### Venue: virtual conference

- ▶ Institute for Basic Science (IBS) +82-42-878-8633
- Expo-ro 55, Yuseong-gu, Daejeon 34126, South Korea