Center for Theoretical Physics of Complex Systems

Institute for Basic Science

# International Workshop

# *Searching for Galactic Axions and Superconducting Devices with Quantum Efficiency*

## October 25 — 29, 2021

*All times in the workshop program refer to Korean Standard Time(KST)*

# Program

# Monday, October 25

*Chairperson: Mikhail Fistul*

15:00 – 15:20 Sergej Flach, PCS IBS

Opening address

15:20 – 15:40 Mikhail Lisitskiy, SPIN CNR, Italy

*SUPERGALAX project: single microwave photon detector based on superconducting qubit network for searching galactic axions*

15:40 – 16:10 Woohyun Chung, IBS CAPP

*R&Ds in Axion Research at IBS/CAPP*

16:10 – 16:40 Sergey Uchaikin, IBS CAPP

*Development of Josephson Parametric Amplifier for CAPP Axion Search Experiment*

16:40 – 17:10 Alexandre Karpov, NUST MISiS, Russia

*Josephson parametric amplifier suitable for axion search experiments*

# Tuesday, October 26

*Chairperson: Mikhail Lisitskiy*

15:00 – 15:30 Gray Rybka, University of Washington, USA
*Recent Results from ADMX*

15:30 – 16:00 Claudio Gatti, INFN, Italy
*Search for Axion Dark Matter with the QUAX Haloscopes*

16:00 – 16:20 Alexandre Zagoskin, Loughborough University, UK
*Towards the Heisenberg limit in microwave photon detection by a qubit array*

16:20 – 16:40 Leonid Kuzmin, Chalmers University of Technology, Sweden
*Direct Observation of Thermal Photons from the 14 GHz Cavity by a Single-Photon Counter within the QUAX project*

16:40 – 17:10 Andrey Pankratov, IPM RAS, Russia
*SIS junction as microwave single photon counter for axion search*

# Wednesday, October 27

*Chairperson: Marco Affronte*

15:30 – 16:00 Pertti Hakonen, Aalto University, Finland
*Generation and characterization of multipartite entanglement in parametric systems at microwave frequencies*

16:00 – 16:30 Alexey Ustinov, Karlsruhe Institute of Technology, Germany
*Waveguide QED of superconducting qubit arrays*

16:30 – 17:00 Andreas Wallraff, ETH Zurich, Switzerland
*Sources and Detectors of Quantum Microwave Radiation*

17:00 – 17:30 Mikko Möttönen, Aalto University, Finland
*Bolometry and calorimetry at extremely low powers and energies: opportunities for qubit and axion experiments*

# Thursday, October 28

*Chairperson: Yannis Semertzidis*

15:30 – 16:00 Bela Majorovits, Max Planck Institute, Germany

*Advances in searching for galactic axions with a Dielectric Haloscope: MADMAX*

16:00 – 16:30 Emanuele Enrico, INRiM, Italy

*Josephson Travelling Wave Parametric Amplifiers as a non-classical light source for microwave quantum illumination*

*16:30 – 16:35 Workshop picture (zoom)*

*Please turn on your camera*

16:35 – 17:35 *IBS Physics Colloquium @Daejeon*

Michael Tobar, The University of Western Australia, Australia
*Searches for Axions at the University of Western Australia*

# Friday, October 29

*Chairperson: Alexandre Zagoskin*

15:30 – 16:00 Marco Affronte, CNR & UNIMORE, Italy

*Detection of magnetic excitations for axions search*

16:00 – 16:30 Evgeni Ilichev, Leibniz Inst. of Photonic Tech., Germany

*Applications of superconducting NbN thin films for microwave quantum engineering*

16:30 – 17:00 Yuri Pashkin, Lancaster University, UK

*Effect of the intense electric field on superconducting coplanar waveguide resonators*

17:00 – 17:30 Fabian Hassler, RWTH Aachen University, Germany

*AC-Josephson effect as a source of entangled microwave photons*

17:30 – 17:35 Scientific coordinators

Closing remarks