

IBS Conference on  
*Flatbands: symmetries,  
disorder, interactions and  
thermalization*

August 16 — 20, 2021

*All time give in the workshop program refer to the time zone KST*

# Program

## Monday, August 16

*Chairperson: Sergej Flach*

15:40 – 16:00 Sergej Flach, PCS IBS

*Opening address*

16:00 – 16:40 Hideo Aoki, University of Tokyo, Japan

*Flatbands as an arena for superconducting and topological properties*

16:40 – 17:20 Amnon Aharony, Tel Aviv University, Israel

*Non-symmetric diamond chains with magnetic and electric fields: flat bands, edge states and topology*

17:20 – 18:00 Chisa Hotta, University of Tokyo, Japan

*Perfect flat band induced by strong spin-orbit coupling*

18:00 – 19:00 *Break*

*Chairperson: Tilen Cadez*

19:00 – 19:15 Vadim Ohanyan, Yerevan State University, Armenia

*Electric field driven flat bands: Enhanced magnetoelectric and electrocaloric effects in frustrated quantum magnets*

19:15 – 19:30 Sang-Jin Sin, Hanyang University, Korea

*Holography, Topology and the Stability of the flat band*

19:30 – 19:45 Jie Liu, Xiangtan University, China

*Localization, phases and transitions in the three-dimensional extended Lieb lattices*

19:45 – 20:00 Oleg Derzhko, ICMP of NAS of Ukraine, Ukraine

*Flat-band physics in the  $S=1/2$  sawtooth-chain systems*

## Tuesday, August 17

*Chairperson: Alexei Andreanov*

- 16:00 – 16:40** Jun-Won Rhim, Ajou University, Korea  
*Novel geometric aspects in flat band systems*
- 16:40 – 17:20** Yasuhiro Hatsugai, University of Tsukuba, Japan  
*Molecular orbital construction of flat bands and applications*
- 17:20 – 17:50** *Break*
- 17:50 – 18:30** Päivi Törmä, Aalto University, Finland  
*Quantum geometry effects on superconductivity,  
Bose-Einstein condensation, and light-matter interactions  
in flat bands*
- 18:30 – 19:10** Tero Heikkilä, University of Jyväskylä, Finland  
*Flat bands in graphene-based systems  
and crystalline topological insulators*

## Wednesday, August 18

*Chairperson: Bohm-Jung Yang*

- 16:00 – 16:40** Hal Tasaki, Gakushuin University, Japan  
*Bose-Einstein Condensation in a System of Interacting Bosons with a Flatband*
- 16:40 – 17:20** Malte Roentgen, University of Hamburg, Germany  
*Compact localized states by local and latent symmetries*
- 17:20 – 17:50** *Break*
- 17:50 – 18:30** Rudolf Roemer, University of Warwick, UK  
*Localization properties in disordered Lieb lattices and their extensions*
- 18:30 – 19:10** Tilen Cadez, IBS PCS  
*Metal-insulator transitions in infinitesimally weakly disordered flatbands*

## Thursday, August 19

*Chairperson: Dario Rosa*

16:00 – 17:00 *IBS Physics Colloquium @ Daejeon*

Daniel Leykam, National University of Singapore, Singapore  
*Flat bands, sharp physics*

17:00 – 17:40 Liqin Tang, Nankai University, China

*Novel phenomena in photonic flatband lattices*

17:40 – 18:20 Clemens Gneiting, RIKEN, Japan

*Lifetime of flatband states*

18:20 – 19:00 *Break*

*Chairperson: Barbara Dietz*

19:00 – 19:15 Anupam Bhattacharya, University of Manchester, UK

*Identification of flat bands in 2D materials using neural network*

19:15 – 19:30 Ihor Vakulchyk, IBS PCS

*Percolation Transitions in Interacting Many-Body Flatband Systems*

19:30 – 19:45 Yeongjun Kim, IBS PCS

*Metal-insulator transitions for weakly disordered flatbands: Additional details*

19:45 – 20:00 Arindam Mallick, IBS PCS

*Wannier-Stark Flatbands*

## Friday, August 20

*Chairperson: Jun-Won Rhim*

- 16:00 – 16:40** Carlo Danieli, MPI PKS, Germany  
*Finetuned localization in interacting flatband networks*
- 16:40 – 17:20** Claudio Castelnovo, University of Cambridge, UK  
*Localisation phenomena in frustrated magnets*
- 17:20 – 18:00** Dario Rosa, IBS PCS  
*An Overview Of The SYK Model And Its Relatives*