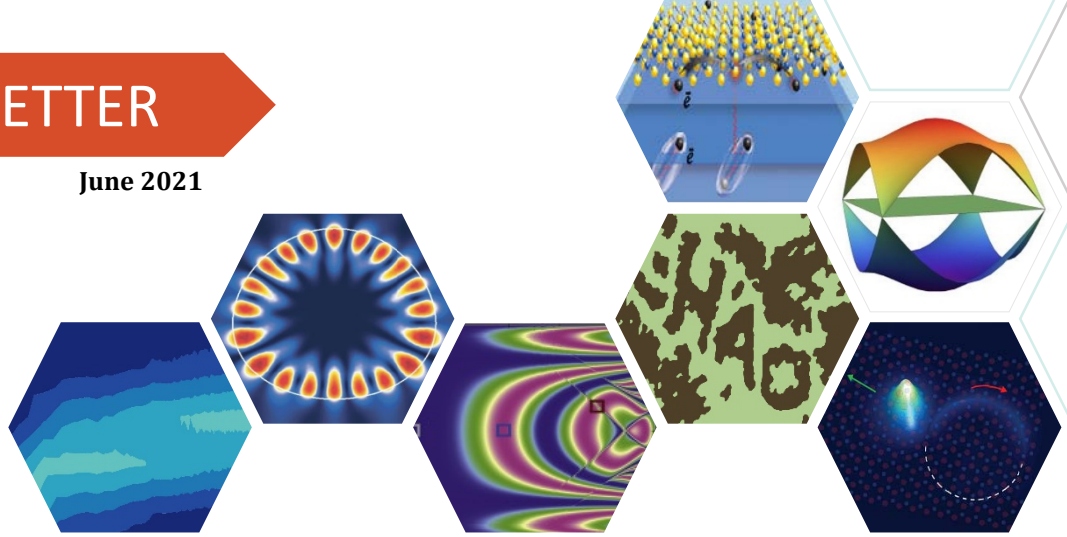




Edit: Sungjong Woo
Design: Gileun Lee



Jobs

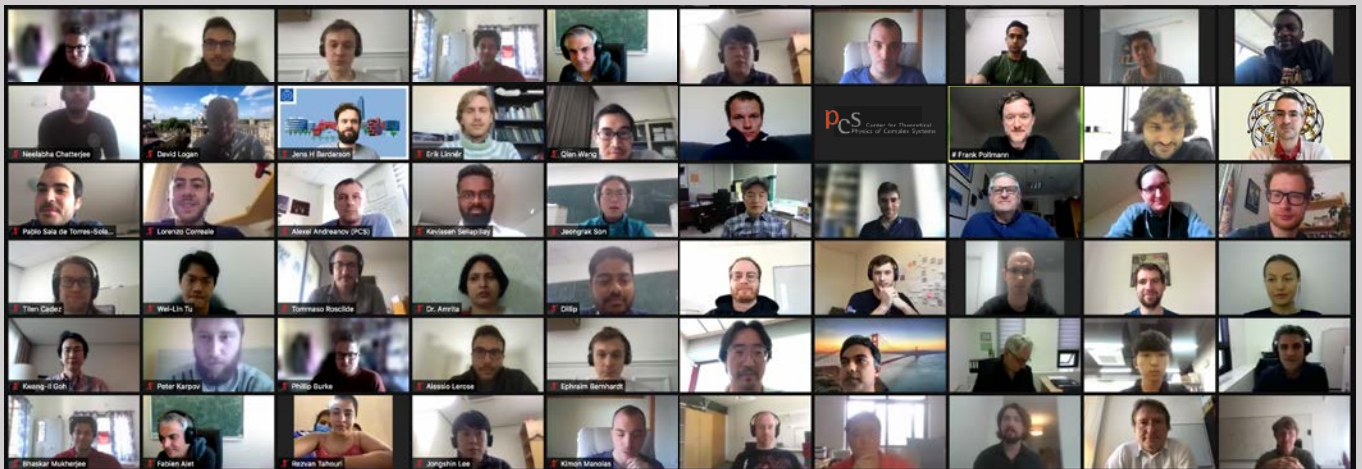


IBS is inviting 2021 IBS Young Scientist Fellow applications. Deadline is **June 30, 2021**.

PCS is also recruiting postdoctoral fellows and Ph.D students for two research teams, [Quantum Chaos in Many-Body Systems](#) led by Dario Rosa and [Topological and Correlated Quantum Matter](#) led by Moon Jip Park.

PCS Workshops and Meetings

PCS successfully hosted the **'International Workshop Quantum Many-Body Dynamics: Thermalization and its Violations'** May 24 – 28, 2021. We enjoyed fourteen invited talks including the IBS Physics Colloquium held by Prof. David Logan (Oxford U) with over two hundred participants.

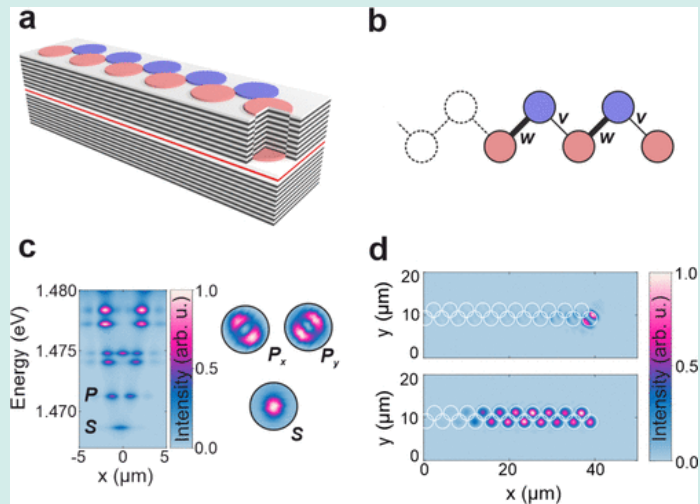


New research results

Coherent topological polariton laser

Tristan H. Harder, Meng Sun, Oleg A. Egorov, Ihor Vakulchyk, Johannes Beierlein, Philipp Gagel, Monika Emmerling, Christian Schneider, Ulf Peschel, Ivan G. Savenko, Sebastian Klemmt, and Sven Höfling
[ACS Photonics](#) **8**, 1377–1384 (arXiv:2005.14546)

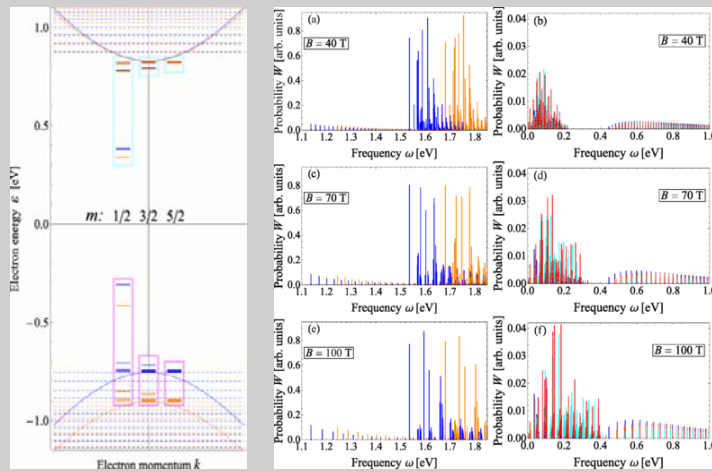
The authors studied exciton-polariton microcavity traps arranged in a one-dimensional Su–Schrieffer–Heeger lattice and forming a topological defect mode. From the analysis of the optical signal from the system, the authors have observed a highly coherent polariton lasing. Furthermore, they confirmed the excitonic contribution to the polariton lasing by applying an external magnetic field. These systematic experimental findings of robust lasing and high temporal coherence of the exciton-polariton system have been reproduced by the generalized Gross–Pitaevskii equation model and the Lindblad master equation approach.



Impurity-band optical transitions in two-dimensional Dirac materials under strain-induced synthetic magnetic field

M. V. Boev, I. G. Savenko, and V. M. Kovalev
[Phys. Rev. B](#) **103**, 245402 (arXiv:2105.04109)

The authors developed an analytical theory of optical transitions in doped two-dimensional transition metal dichalcogenide monolayers. In particular, they studied the transitions from the spin-resolved valence band to the donor and acceptor impurities under the influence of a synthetic magnetic field produced by a mechanical strain. The authors have shown that the optical properties of the system are determined by the strength of the synthetic magnetic field, which suggests an experimental tool to manipulate the properties of two-dimensional materials in valley magneto-optoelectronics.



Puzzle of the month (May – June)

Surprisingly we did not receive any answers - not even wrong ones. Even more surprising since most of the readers are trained in Physics. **That raises the jackpot to a free lunch.** We repeat the puzzle from the previous issue. Don't miss your chance for a free lunch!



New technologies invade our kitchens. Among them there is the electric egg cooker, also called egg boiler. The term 'egg steamer' would suit better, since the eggs are steamed rather than boiled. The typical egg cooker can host up to seven eggs. We take exactly three eggs from the fridge and place them in the corresponding spots of the egg tray. The tray and the eggs are suspended above the heating plate. A certain and relatively small amount of water is poured into a measuring cup.

That water is then emptied into the heating plate. Note that the eggs are still fully suspended in air, without water contact. The transparent lid is put on top and is covering the entire device. There are small holes in the lid. The device is then switched on and powered at about 300-400 Watts. The water heats up and boils producing steam. The hot steam rises and heats up the eggs. Some vapor escapes through the lid holes. After approximately 17 steaming minutes all the water evaporated from egg cooker, and a loud beep signals to switch off the device. The eggs appear to be boiled to the desired degree of hard-boiling condition (hard boiling eggs in a pot with boiling water takes a bit less - about 14 minutes).

Now we want to repeat the experiment with four eggs. Do we need to add more water to the measuring cup, or less, or the same amount? Why? How much more or less if not the same? What is the egg shell temperature during the steaming process?

Send your solution to eun@ibs.re.kr

The winner will be announced in the next issue.