

## PCS Workshops and Meetings

PCS will co-host Joint Thailand-Cambodia Mini-School on Quantum Materials: Theory and Experimentation on June 18 - 20, 2025

# PCS IBS Seminars

"Exotic magnonic transport in 2D magnets" by Se Kwon Kim, KAIST, Korea (May 20)

"Towards ultracold MgF molecules for quantum information science" by Eunmi Chae, Korea University, Korea (May 22), *IBS Physics Colloquium @ Daejeon* 

"Topological characterisation of magnetostatic surface spin waves" by Kei Yamamoto, Japanese Atomic Energy Agency, Japan (May 27)

You can find more seminars on this page.





## New Research Results

Thermalization slowing down of weakly nonintegrable quantum spin dynamics

Budhaditya Bhattacharjee, Alexei Andreanov, and Sergej Flach

Phys. Rev. Research 7, 023149 (2025)

The authors study thermalization slowing down of a quantum many-body spin system upon approach to two distinct integrability limits. Motivated by previous studies of classical systems, they identify two thermalization time scales: one quantum Lyapunov time scale is extracted by quantifying operator growth in time on an appropriately defined basis, while another ergodization time scale is related to the statistics of fluctuations of the time-evolved operator around its mean value based on the eigenstate thermalization hypothesis. Using a paradigmatic Quantum Ising chain the authors find that both timescales diverge upon approach to integrability. They investigate the relative strength of the divergence in the two limits and find that despite significant qualitative differences in the mechanism of integrability breaking, the timescales diverge in a similar fashion. This allows a universality of integrability breaking in quantum spin dynamics to be established.



#### Puzzle of the Month

#### May puzzle solution:

- 1. To have a six-digit number 6\*ABCDEF, we need A=1.
- 2. 5\*ABCDEF ends with E, hence E=0 or 5. Since 4\*ABCDEF = EFABCD, E=4.
- 3. 3\*EF ends with F1, then F=1 or 7. Using 5\*ABCDEF, we see that F>=5, so F=7.
- 4. Now we can use only the last digits to have B=4, C=2, D=8.

So, the answer is 142857.

This correct solution was sent in by Oleg Utesov, congratulations!

Puzzle of the month:

The positive z=p/q is the irreducible ratio of positive integers q and q < p (fraction in lowest terms, numerator and denominator have no common factors other than 1).

How many pairs of (p,q) exist for which both z and 1/z have at most two digits after the comma in decimal representation? How many for at most three digits?

How many for at most N digits?

Send your solution to <u>eun@ibs.re.kr</u> The winner will be announced in the next issue.

