Summary of CPNR Workshop

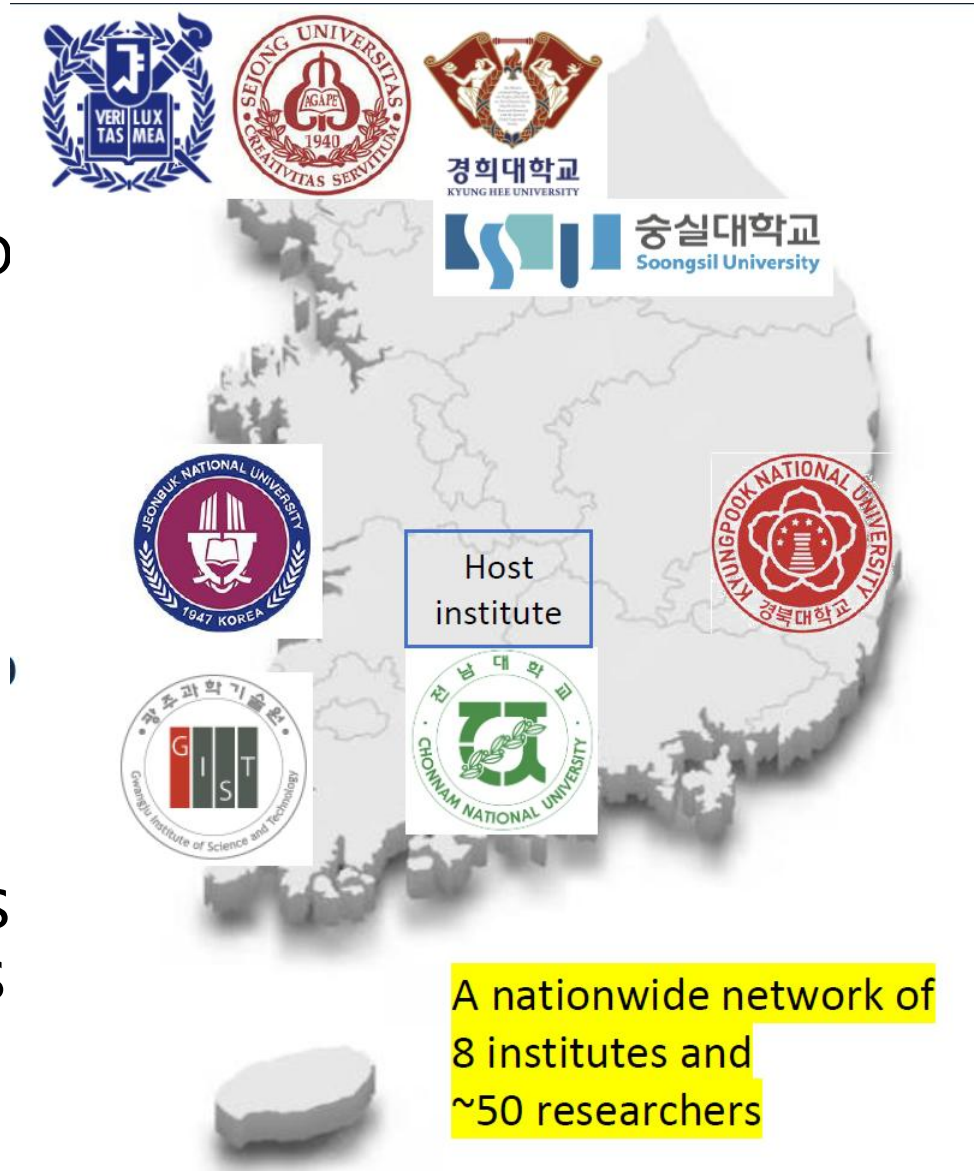
Byeongsu Yang
(Chonnam National University)

2026.10.30

NNN26, Chung-Ang University

CPNR at a Glance

- Established in 2022 to strengthen neutrino research in Korea
- Supports experimental, detector, theoretical, and analysis activities in international and domestic collaborations
- Builds capacity for future Korean led neutrino programs
- Fosters domestic and international exchange through workshops, conferences and support for neutrino related meetings in Korea



CPNR Workshop Overview

CPNR Workshop 2026: Neutrinos and Physics beyond the Standard Model

- Date: October 26, 2026
- Venue: Chung-Ang University, Seoul, South Korea
- Hosted by the Center for Precision Neutrino Research (CPNR/CNU), and so on.
- The second annual CPNR workshop, held as a satellite program of NNN2026
- 11 talks spanning theory, experiments, and detector R&D

Program scope

- Theory and phenomenology: new neutrino interactions and properties; quantum-sensing concepts
- Experimental results and ongoing searches: neutrino oscillations, sterile neutrinos, and dark matter
- Detector R&D: neutrino detectors and future colliders

Precision Neutrino Physics and New Interactions

Mariam Tórtola — New physics searches

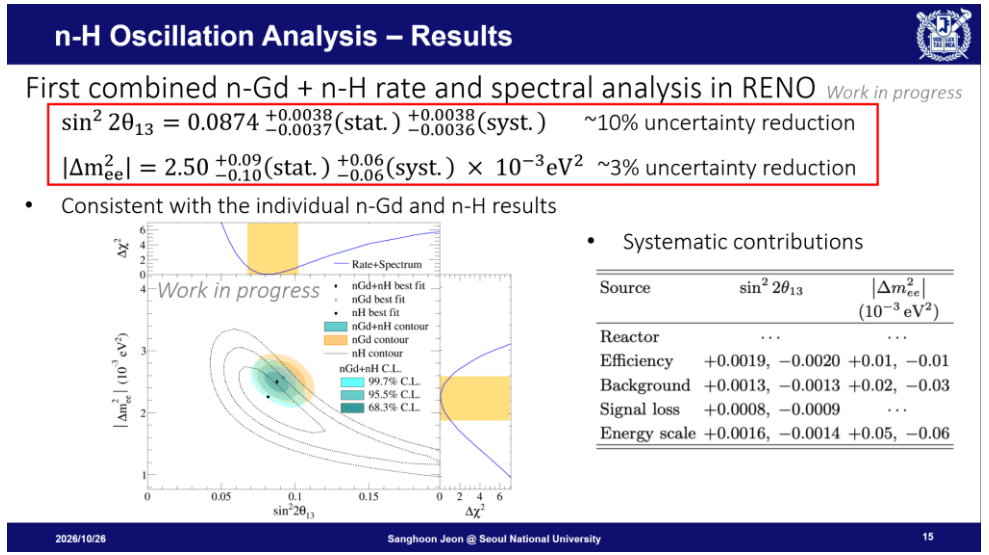
- Overview for precision measurements and complementary probes of new neutrino properties.

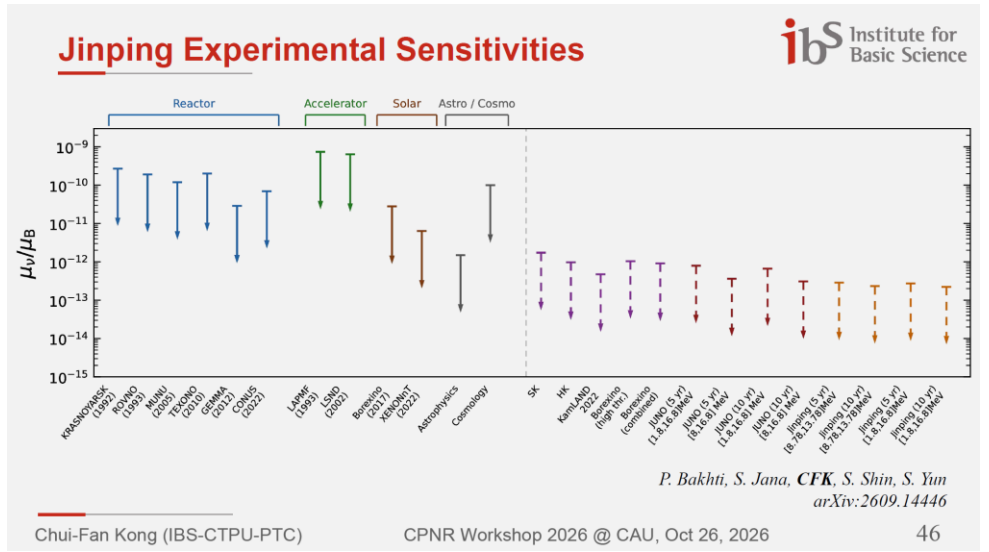
Sanghoon Jeon — RENO Final 3,800-day

- Joint n-Gd + n-H analyses ongoing.
- Fuel decomposition analysis ongoing

Chui-Fan Kong —Solar neutrino magnetic moments (phenomenology)

- Solar $\bar{\nu}_e$ searches at Jinping could constrain neutrino magnetic moments.





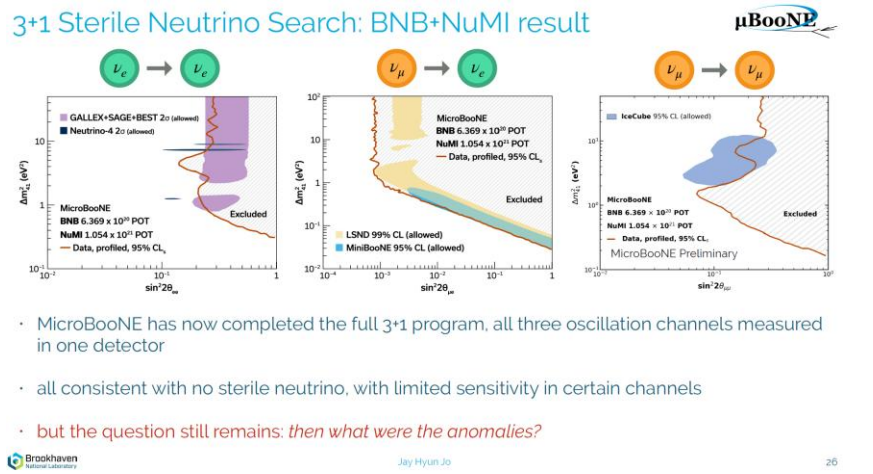
Sterile Neutrinos: Complementary Tests of the Anomalies

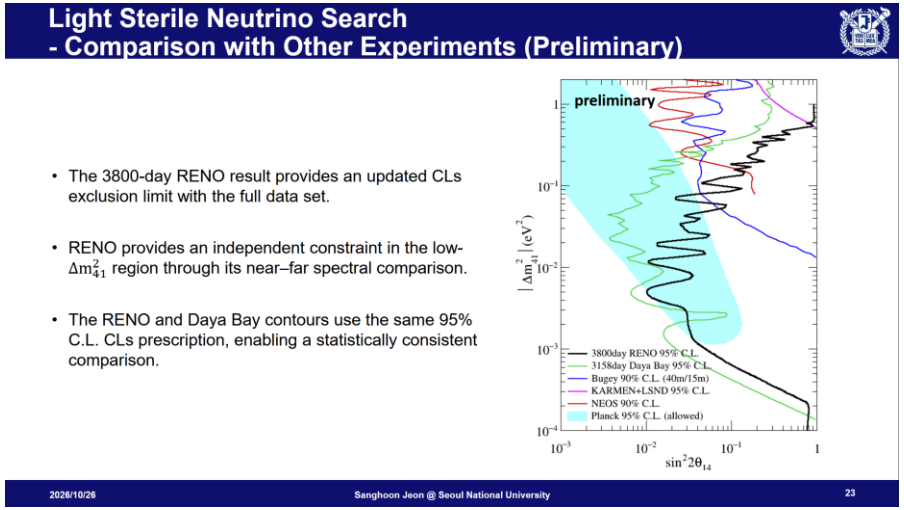
Jay Hyun Jo — MicroBooNE

- Two beams, three channels, one detector.
- Complementary appearance and disappearance constraints within the tested models.

Sanghoon Jeon — RENO

- 3,800-day search using CLs; expected-contour studies ongoing.





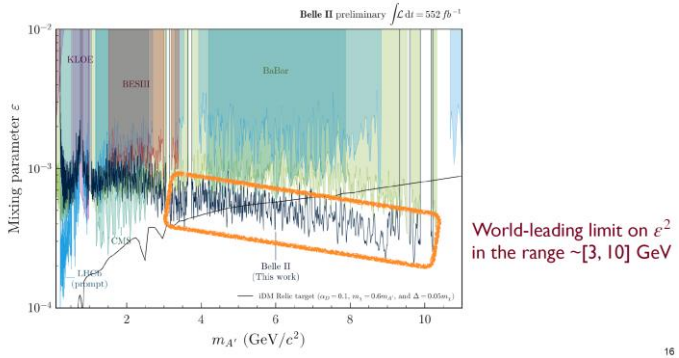
Dark-Sector Searches and Emerging Approaches

Youngjoon Kwon — Belle II

- Dark-sector searches at O(1–10 GeV).

$$e^+e^- \to \gamma A'(A' \to \mu^+\mu^-)$$

Preliminary



World-leading limit on ε^2 in the range ~[3, 10] GeV

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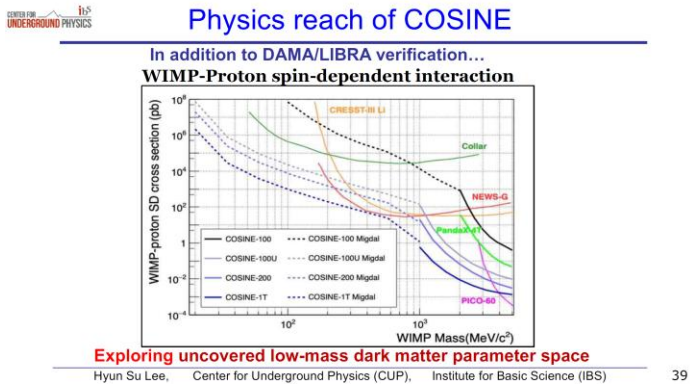
SungWoo Youn — Axion searches

- Recent results and continuing axion searches.



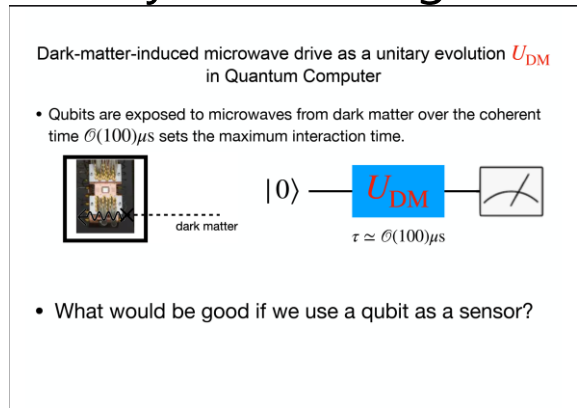
Hyunsu Lee — COSINE

- Testing DAMA/LIBRA; extending low-mass dark-matter sensitivity.



Myeonghun Park — Quantum sensing for inivisibles

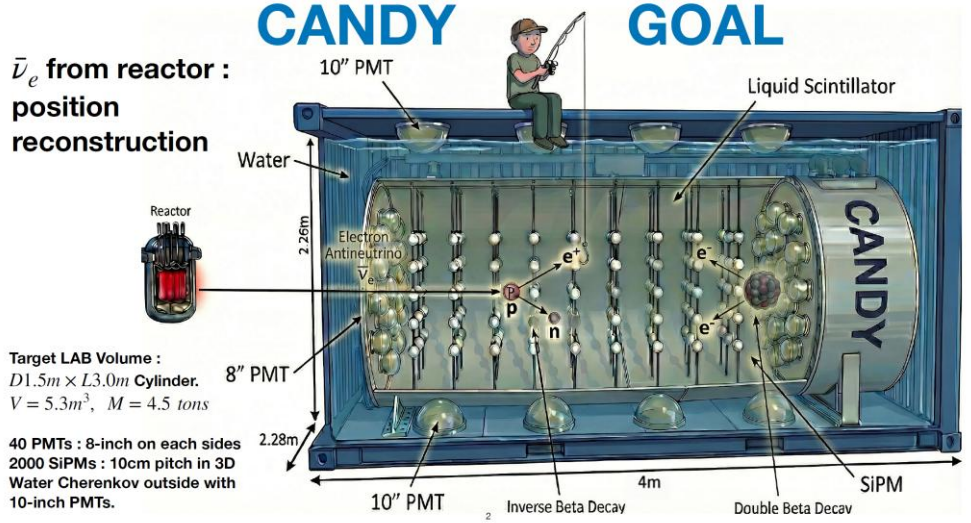
- Proposed quantum-sensing approaches to dark matter and feebly interacting relics.



Detector R&D for Neutrino Experiments

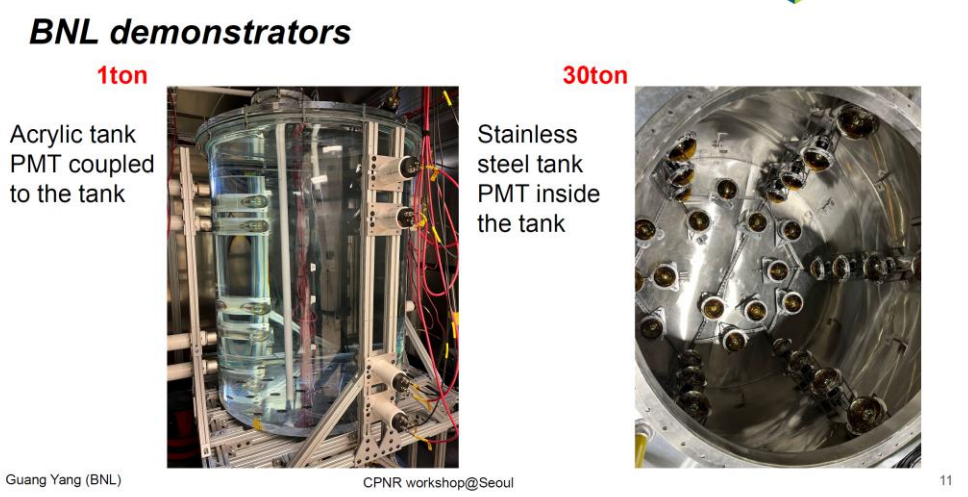
Chang Hyon Ha — Position-sensitive scintillators

- Promising initial data from a 125-channel prototype.
- Target: sub-centimeter position resolution.



Guang Yang — Water-based Liquid Scintillator

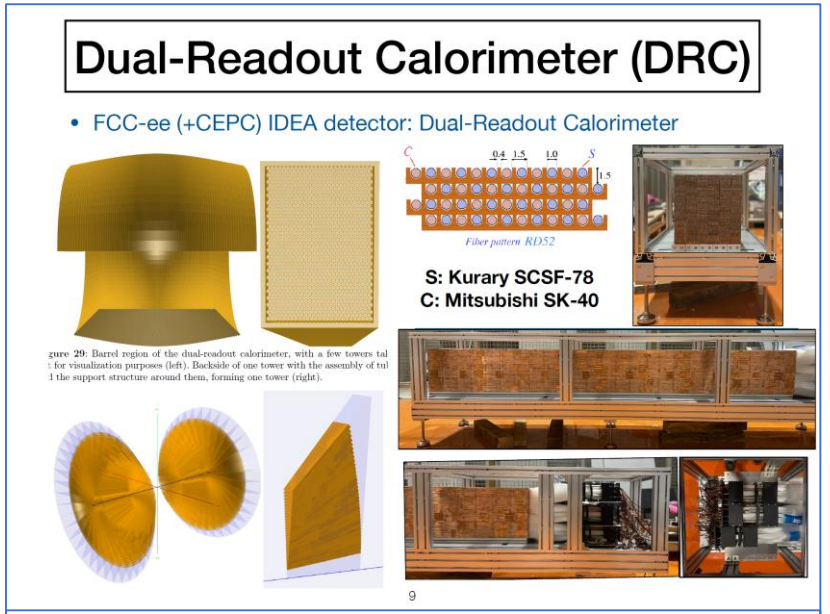
- Light yield, stability, and transparency studies.
- Demonstrations toward Cherenkov/scintillation separation and Gd neutron tagging.

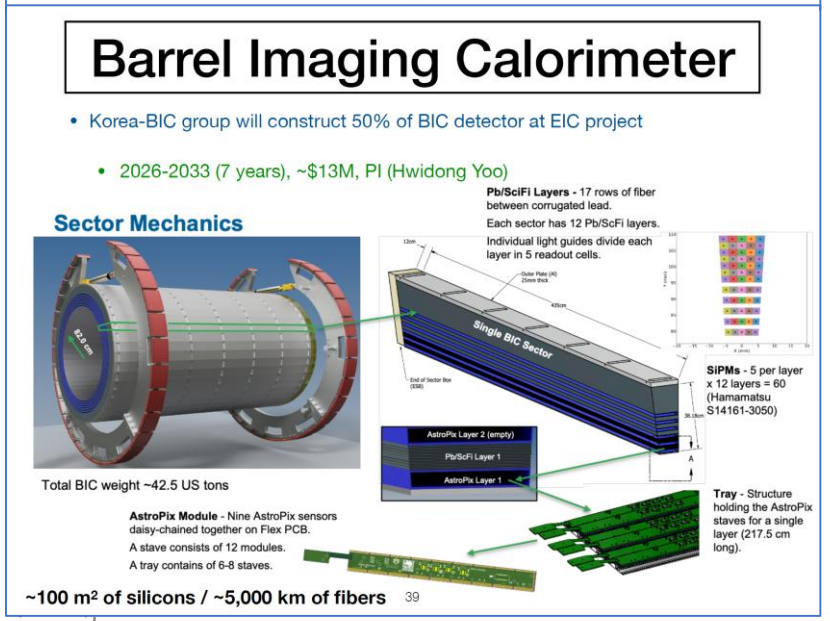


Detector R&D for Future Colliders

Hwidong Yoo — Korean activities for FCC-ee and the EIC

- FCC-ee
  - Active Korean R&D on dual-readout calorimetry.
- EIC [Figure: Barrel Imaging Calorimeter design or construction overview]
  - Major Korean role in BIC construction.
  - Half of the BIC planned to be built in Korea.





Take-home Messages

- Neutrinos remain a powerful window to new physics.
  - Precision oscillation measurements and searches for non-standard properties provide complementary opportunities.
- Complementary searches are essential.
  - Different channels and experimental approaches test neutrino anomalies and a broad range of dark-sector scenarios.
- Detector development was another major component.
  - The program covered position-sensitive scintillators and WbLS for neutrino experiments, alongside separate FCC-ee and EIC detector activities.

Thank you to all speakers, organizers, and participants

