Closing remarks

Junichi Tanaka (ICEPP, UTokyo)

2 international versions (+1 national version)

The next workshop in a better season!?

From Nakahama-san's introduction slide

The scope of the workshop

• to highlight recent progresses in the state-of-the-art ML
  applications to high energy physics and astrophysics
  through several talks by <u>world-leading researchers</u>, and
• to overview the related researches <u>progressing in Japan</u>.

My personal view and also biased to HEP not Astro/Cosmology:
⋯ indicating our current situation is ⋯
we (Japanese HEP people) are still chasing the top runners.
Ex: ML4Jets2023 ⋯ 0 talk, Boost2023 ⋯ 2 talks (by my eye scan)

From Ikeda-san's slide

Strike me⋯
(Ikeda-san is neither HEP or Astrophysics person.)

The situation is getting better by having the ML WS.
Many people are interested in AI/ML/DL.
→ Many (young) developers, many outputs, ⋯
   Also many international collaborations.

ICEPP
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TUESDAY, 9 JANUARY

- 12:30 → 13:00 **Registration** — 30m
- 13:00 → 13:05 **Opening** — Speaker: Yu NAKAHAMA (KEK) — Welcome.pdf — 5m
- 13:05 → 13:45 **Data Science for Astronomy** — Speaker: Shiro Ikeda (The Institute of Statistical Mathematics) — 2024.0109.KEK_ike... — 40m
- 13:45 → 14:25 **Review: Low-level object reconstruction and simulation using ML** — Speaker: Vinicius Mikuni (LBL) — ML@HEP_Reco.pptx — 40m
- 14:25 → 15:05 **ML for Jet Tagging: Status and Prospects** — Speaker: Huilin Qu (CERN) — JetTaggingML_H_Q... — 40m
- 15:05 → 15:10 **Group Photo** — 5m
- 15:10 → 15:35 **Coffee** — 25m
- 15:35 → 16:15 **Dark Matter Applications of Machine Learning** — Speaker: Matt Buckley (Rutgers University) — KEK2024_buckley.pdf — 40m — Minutes
- 16:15 → 16:35 **Flow-Matching models for the LHC** — Speaker: Darius Faroughy (Rutgers University) — ML_farougy.pdf — 20m
- 16:35 → 16:55 **AI Methods in Galaxy Formation** — Speaker: Suchetha Cooray (NAOJ) — 20m
- 16:55 → 17:15 **Multi-Scale Cross-Attention Transformer Encoder for Event Classification** — Speaker: Ahmed Hammad (KEK) — Talk_Hammad.pdf — 20m
- 17:15 → 17:35 **A data-driven and model-agnostic approach to solving combinatorial assignment problems in searches for new physics** — Speaker: Javier Montejo (IFAE Barcelona & QUP) — 20240109_MLHEP_... — 20m

WEDNESDAY, 10 JANUARY

- 09:30 → 10:10 **Prospects of LLMs for Fundamental Physics** — Speaker: Mariel Pettee (LBL) — 40m
- 10:10 → 10:50 **Review and Perspective on AI for Observational Cosmology** — Speaker: François Lanusse (Simons Foundation/CNRS) — 40m
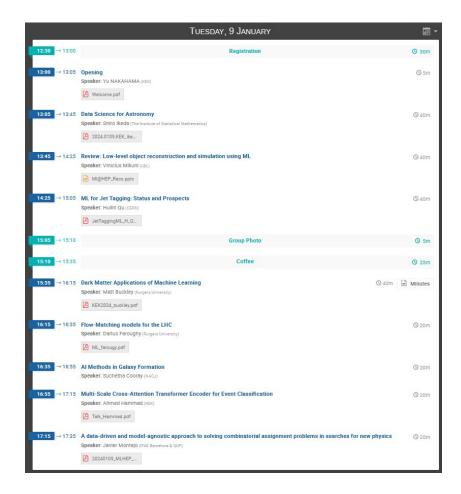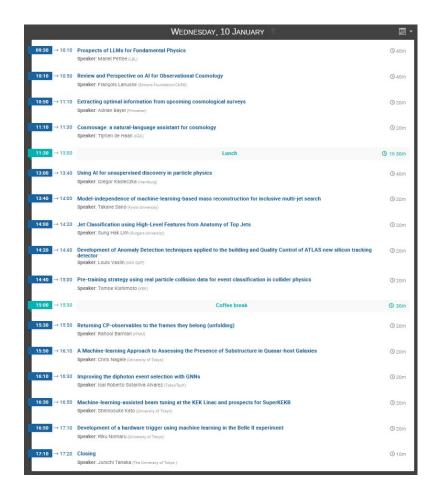- 10:50 → 11:10 **Extracting optimal information from upcoming cosmological surveys** — Speaker: Adrian Bayer (Princeton) — 20m
- 11:10 → 11:30 **Cosmosage: a natural-language assistant for cosmology** — Speaker: Tijmen de Haan (KEK) — 20m
- 11:30 → 13:00 **Lunch** — 1h 30m
- 13:00 → 13:40 **Using AI for unsupervised discovery in particle physics** — Speaker: Gregor Kasieczka (Hamburg) — 40m
- 13:40 → 14:00 **Model-independence of machine-learning-based mass reconstruction for inclusive multi-jet search** — Speaker: Takane Sano (Kyoto University) — 20m
- 14:00 → 14:20 **Jet Classification using High-Level Features from Anatomy of Top Jets** — Speaker: Sung Hak Lim (Rutgers University) — 20m
- 14:20 → 14:40 **Development of Anomaly Detection techniques applied to the building and Quality Control of ATLAS new silicon tracking detector** — Speaker: Louis Vaslin (KEK QUP) — 20m
- 14:40 → 15:00 **Pre-training strategy using real particle collision data for event classification in collider physics** — Speaker: Tomoe Kishimoto (KEK) — 20m
- 15:00 → 15:30 **Coffee break** — 30m
- 15:30 → 15:50 **Returning CP-observables to the frames they belong (unfolding)** — Speaker: Rahool Barman (IPMU) — 20m
- 15:50 → 16:10 **A Machine-learning Approach to Assessing the Presence of Substructure in Quasar-host Galaxies** — Speaker: Chris Nagele (University of Tokyo) — 20m
- 16:10 → 16:30 **Improving the diphoton event selection with GNNs** — Speaker: Isai Roberto Sotarriva Alvarez (TokyoTech) — 20m
- 16:30 → 16:50 **Machine-learning-assisted beam tuning at the KEK Linac and prospects for SuperKEKB** — Speaker: Shinnosuke Kato (University of Tokyo) — 20m
- 16:50 → 17:10 **Development of a hardware trigger using machine learning in the Belle II experiment** — Speaker: Riku Nomaru (University of Tokyo) — 20m
- 17:10 → 17:20 **Closing** — Speaker: Junichi Tanaka (The University of Tokyo) — 10m

Excellent 7 invited talks and 15 contributions talks

Thanks to all the speakers!!!

Special thanks to

- Nakahama-san
- KEK QUP secretaries : Kobayashi-san & Ikenobe-san

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3