

# A Proto-Collaboration for the Terrestrial Very Long Baseline Atom Interferometer Study

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# TVLBAI Proto-Collaboration?

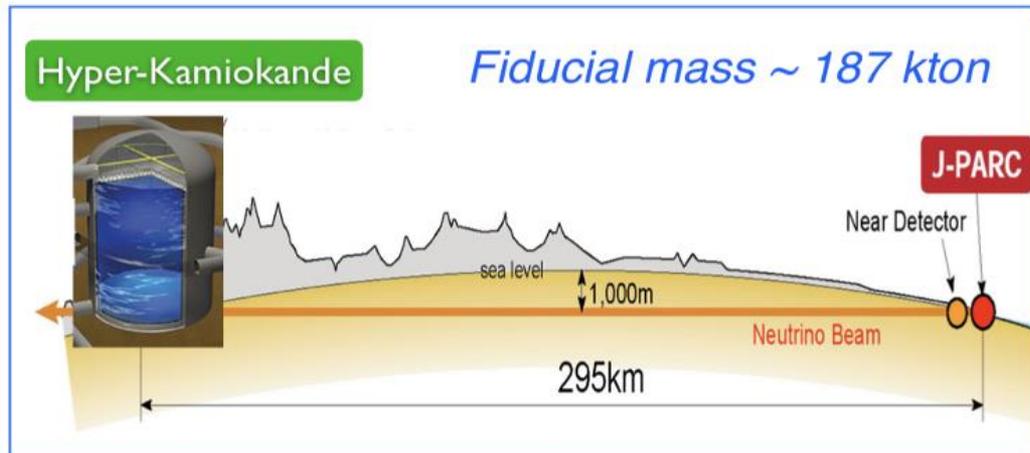
- The Terrestrial Very Long Baseline Atom Interferometer study participants represent a rich variety from different fields of expertise.
- Workshops such as this one are extremely useful to flesh out ideas and consider options for (a) large scientific project(s) of a length of 100m-1km
- To move towards a possible realization of such a huge project, it will be important to bring the study to a next level of organization.
- The formation of a proto-collaboration is proposed as a next step in the evolution of the Terrestrial Very Long Baseline Atom Interferometer study

# Proto-Collaboration

- **Why?**
- In High Energy Physics (HEP) it is a concept regularly used as a step in the evolution of a project, to help the participating groups with focus, organization and coherence towards a defined scientific goal. A proto-collaboration needs an organigram with a structure to be agreed.
- **What?**
- A non-legally binding agreement, a Memorandum of Understanding, is set up, which interested participants can sign in order to join the proto-collaboration. It defines the common scientific goals of the project.
- The Terrestrial Very Long Baseline Atom Interferometer study is entering a critical phase where such MOU will be very beneficial!

# Recent Proto-Collaboration Examples in HEP

- **T2HK:** The Tokai to HyperKamiokande Neutrino Experiment
- **Formed in 2015:** signed by 73 institutes from 15 countries with ~200 members
- In 2019 this proto-collaboration turned into a full collaboration and had doubled in size by then.



## Kamiokande Proto-Collaboration

2 February 2015 - ICRR

### KEK and ICRR sign a MOU on the Hyper-

On January 31st, 2015, the Inaugural Symposium of the Hyper- and Signing Ceremony was held at Kashiwa-no-ha Conference Center. The Hyper-Kamiokande project aims to address the mysteries of the origin and evolution of the Universe's matter and to confront theories of elementary particle unification. To realize these goals the project will combine a high intensity neutrino beam from the Japan Proton Accelerator Research Complex (J-PARC) with a new detector based upon precision neutrino experimental techniques developed in Japan. The Hyper-Kamiokande project will be about 25 times larger than Super-Kamiokande, the research facility that was first to discover evidence for neutrino mass in 1998.

The symposium was held to commemorate and promote the proto-collaboration to advance the Hyper-Kamiokande project internationally. In addition, a signing ceremony marking an agreement for the promotion of the project between the Institute for Cosmic Ray Research (ICRR) of the University of Tokyo and the Institute of Particle and Nuclear Studies of the High Energy Accelerator Research Organization (KEK) took place during the symposium.

The symposium was attended by more than 100 Hyper-Kamiokande researchers including an international steering committee and an institutional board of representatives with members from 13 countries to celebrate the event.



The Institute for Cosmic Ray Research (ICRR) of the University of Tokyo and Institute of Particle and Nuclear Studies of High Energy Accelerator Research Organization (KEK) signed the Memorandum of Understanding of the cooperation in the Hyper-Kamiokande project.

For more information about Hyper-Kamiokande please see the website below. Additional symposium details including the agenda and presentation slides are also provided on the website.  
<http://www.hyper-k.org/en/symposium-20150131.html>

300+ member (proto)Collaboration, comprising 17 countries in Asia, Europe and the Americas, inscribed in 82 institutes (75% international)

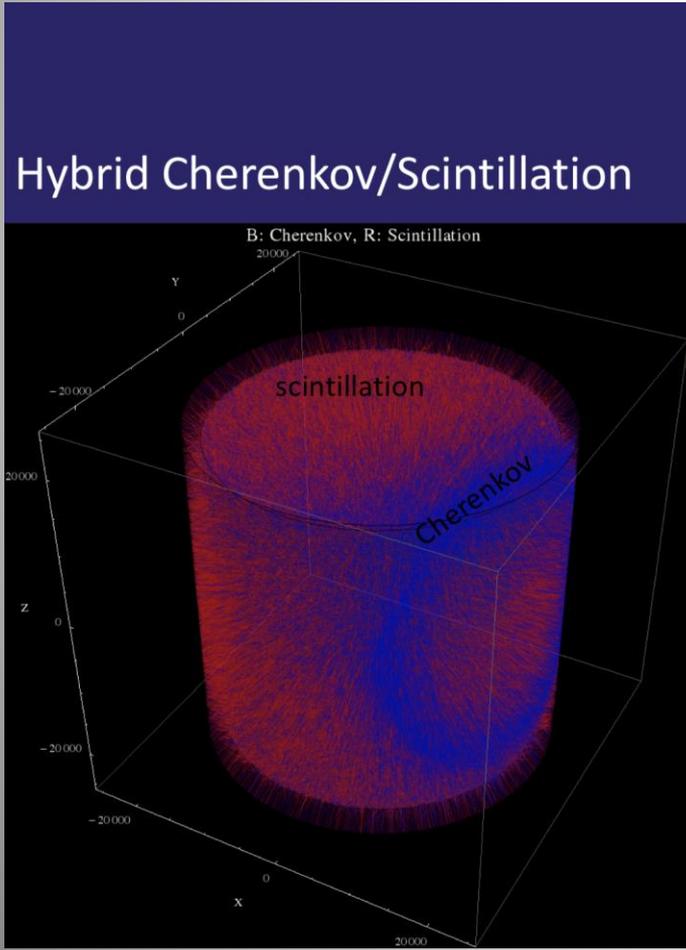


March 2018 protoCollaboration meeting in UAM (Madrid, Spain)

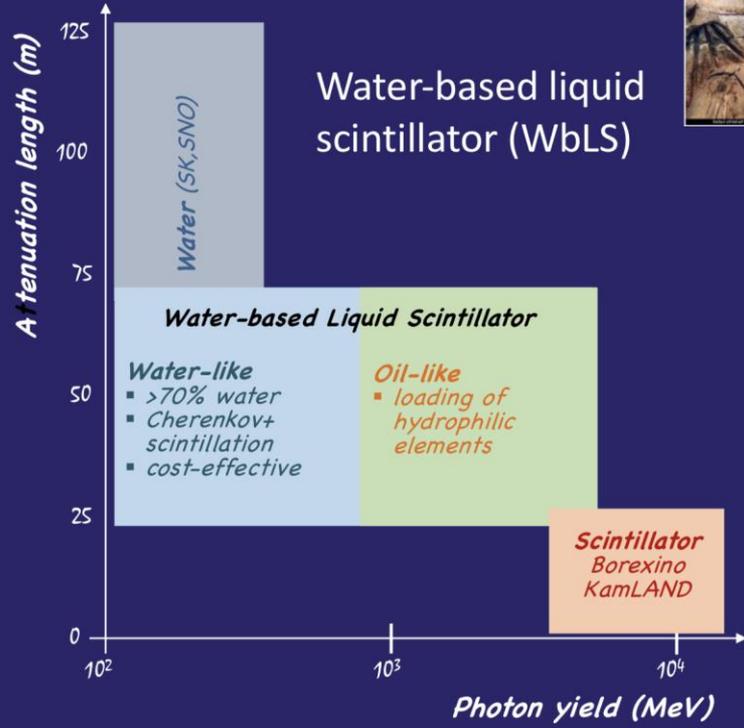


# Recent Proto-Collaboration Examples in HEP

**THEIA: a proto-collaboration since 2022** with 31 institutes and ~100 people. It is an R&D project for a large detector. THEIA could become a Stand-alone project or become a part of the DUNE neutrino experiment...



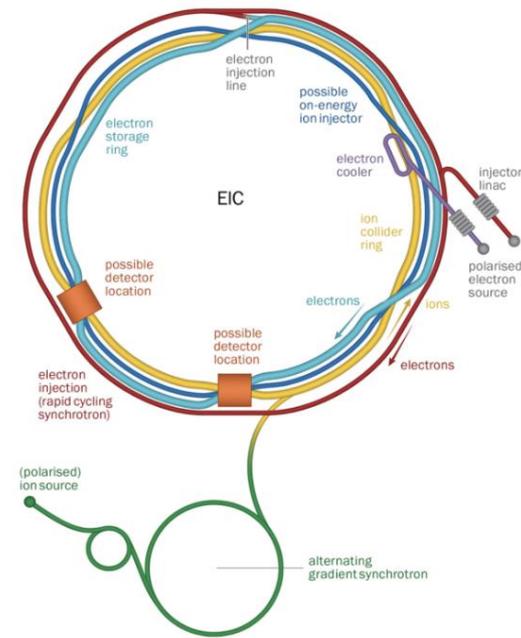
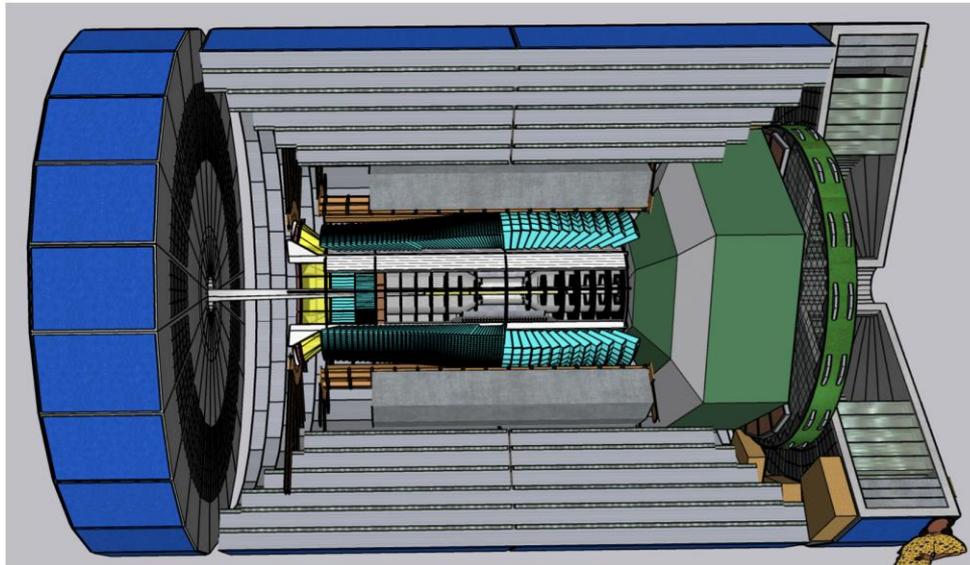
## THEIA



Target can be adjusted for different physics goals

# Recent Proto-Collaboration Examples in HEP

- **CORE: COmpact detectoR for EIC**
- **Proto-collaboration formed in 2022** with 25 institutes & 60 people. CORE will be 200 M\$ experiment
- The Electron Ion Collider (EIC) is a new accelerator under construction at BNL



- Other examples: LBNF accelerator project (2015), ILD (2008), Calorimeter detector R&D (2024), Mu3e (2012)...

# Summary of examples of Proto-Collaborations

- Mu3e: successful transition to experiment
- T2HK: successful transition to experiment
- LBNF: successful transition to accelerator
- **ILD: awaiting approval of ILC accelerator**
- THEIA: still proto-collab, good progress in organization/design/impact
- CORE: still proto-collab, good progress in organization/design/impact
- Calorimeter detector R&D: just started

# TVLBAI Proto-Collaboration!

- The TVLVAI study consists of a healthy and much needed combination of expertise from different fields.
- A PC will allow the project to focus on a common future vision and roadmap. Goal: eg a Conceptual Design Report
- It will allow to talk with one voice toward the outside world, eg now with MAGIS. Organize workshops and meetings
- It allows to set up a formal structure with eg an institutional board (IB) with representatives of all institutes, to make project decisions, and led by an elected chairperson
- It will facilitate preparing coherent funding requests for resources in future.
- Significant secured funding or approval at some level can be a trigger to proceed to full collaboration agreement
- Details on a possible MOU given by Georgio Calatroni next!