Imperial College London

ENUBET and nuSTORM

Science and Technology Facilities Council

- **Scientific programme**
  - Precise, systematic, ν_e, cross section
  - Exquisite sensitivity to BSM
- **Cability**
  - Uniquely high-quality neutrino beam
  - Path to new horizon at energy frontier
- **Opportunity**
  - ESPP:
    - Neutrino cross sections and muon collider
- **Partnership:**
  - ENUBET, nuSTORM, iMC
- **Exploitation:**
  - Now! Physics case, capability case, scientific and peer-group partnership case:
    - Foundations for endorsement of initiative at next ESPPU

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ENUBET &

Outlook

- Our present understanding of (few-GeV) neutrino interactions with matter would be **greatly improved** by new precise measurements with well-understood ν**STORM** flux at **advanced detectors.**
- The future neutrino oscillation program can **greatly benefit.**
- Progress in **hadron** and **nuclear physics**.
- Potential to **discover/constrain non-standard interactions** and **exotic processes.**
- Sensitive searches for **short-baseline flavor transitions**: potential to **discover sterile neutrinos** or **exclude (10 σ)** the presently allowed parameter space.

L. Alvarez-Ruso, IFIC NuFact 20|21

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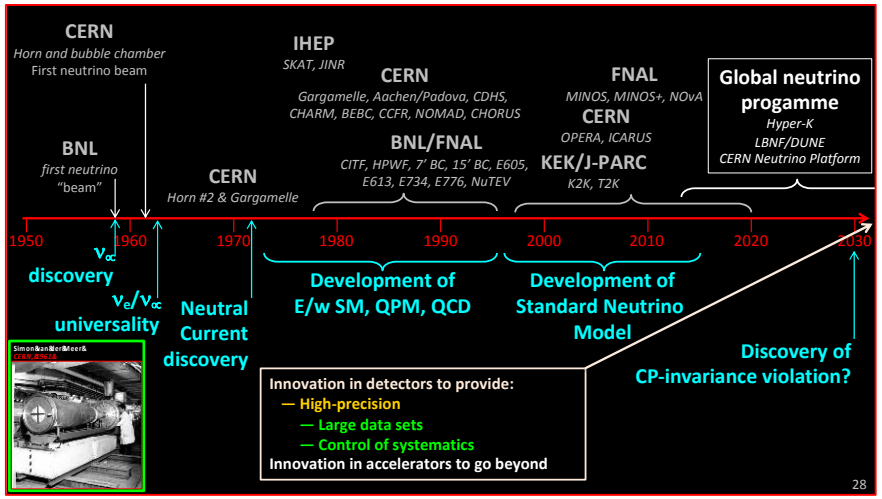

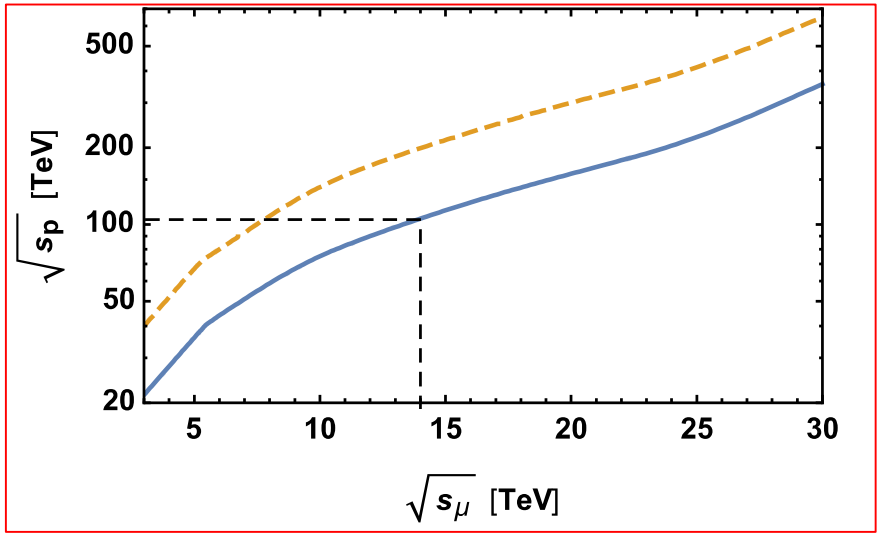

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European Strategy Update

Innovative accelerator technology underpins the physics reach of high-energy and high-intensity colliders… The technologies under consideration include high-field magnets, high-temperature superconductors, plasma wakefield acceleration and other high-gradient accelerating structures, bright muon beams, energy recovery linacs. The European particle physics community must intensify accelerator R&D and sustain it with adequate resources. …

High-priority future initiatives

To extract the most physics from DUNE and Hyper-Kamiokande, a complementary programme of experimentation to determine neutrino cross-sections and fluxes is required. Several experiments aimed at determining neutrino fluxes exist worldwide. The possible implementation and impact of a facility to measure neutrino cross-sections at the percent level should continue to be studied.

Other essential scientific activities for particle physics

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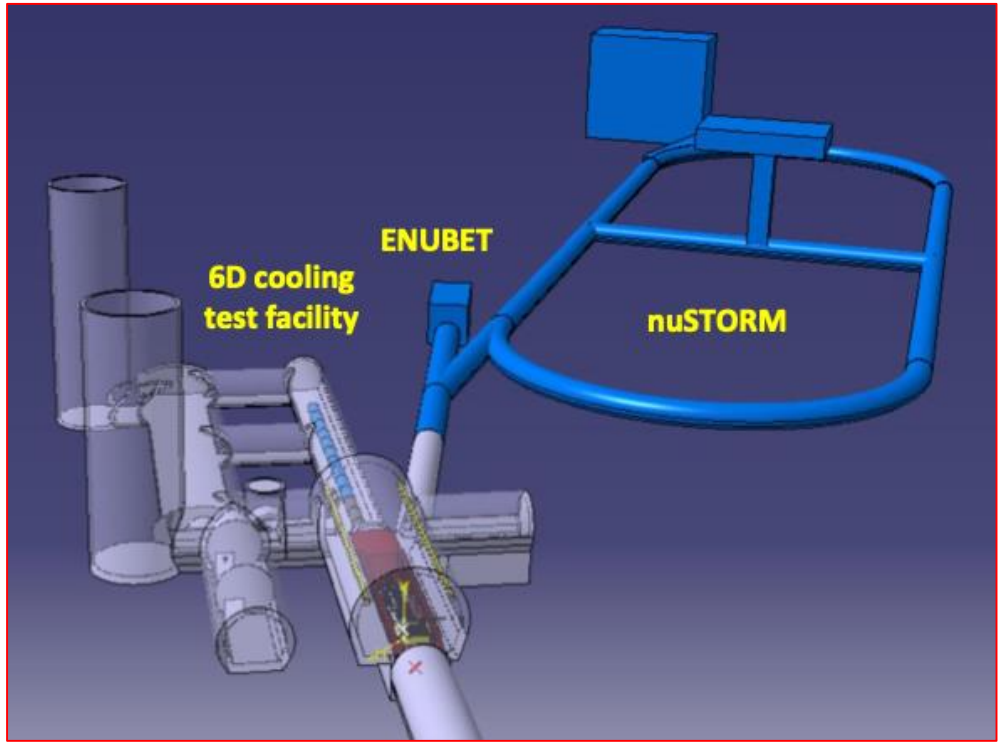

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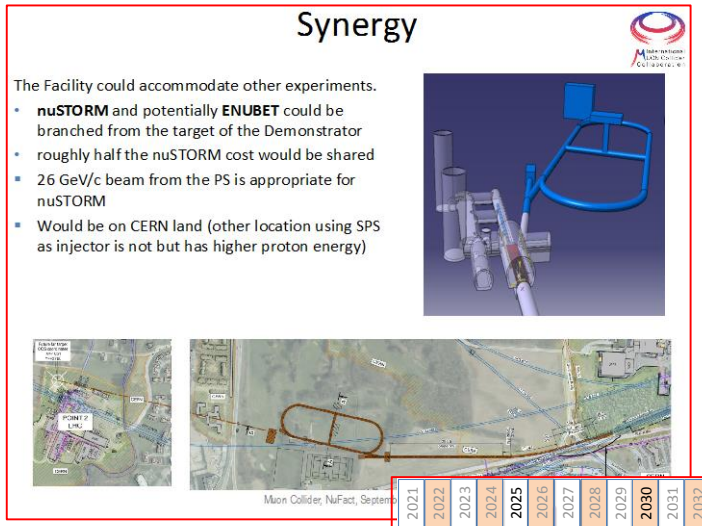

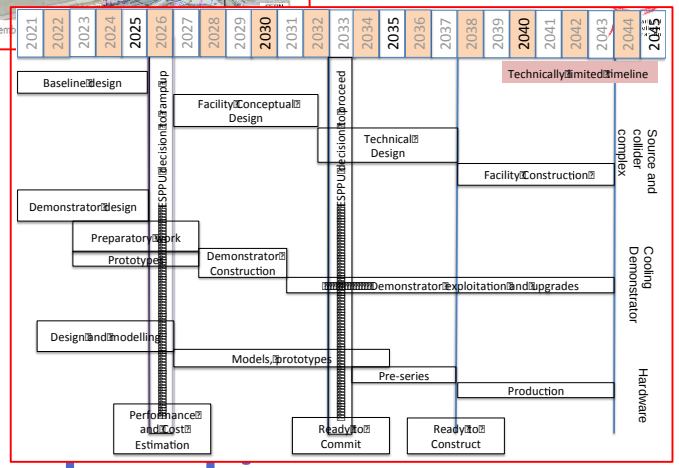

K. Long, 11 September, 2021