nuSTORM—the next steps

Workshop at CERN: 21-22 October 2019

CERN BE auditorium (Prevessin 774/R-013)

https://indico.cern.ch/event/837890/

Bulletin: workshop goals

The feasibility of the implementation of nuSTORM at CERN has been established through CERN's Physics Beyond Colliders study group. The present initiative to (re)evaluate the scientific potential of nuSTORM has grown out of discussions at the ESPPU Open Symposium in Granada. At the Granada meeting it was noted that nuSTORM could be part of a future European contribution to neutrino physics and that the nuSTORM facility could provide an essential test bed for the development of technologies required for a future Muon Collider.

The Physics Briefing Book prepared as input for the ESPPU has just been published [1]. The document recognises both the neutrino-physics potential of nuSTORM and its potential to 'boost R&D toward energy frontier muon colliders."

The goal for the 21/22 October nuSTORM workshop at CERN is that it will be the starting point for a critical and quantitative review of the contributions that nuSTORM can make in the fields of:

- Neutrino scattering;
- Searches for light sterile neutrinos and other exotic phenomena; and
- The development of the technologies and capabilities necessary to deliver a future Muon Collider.

The evaluation of the scientific potential must go alongside the continued development of the accelerator study and a proper investigation of the detector options.

When considering these issues we should bear in mind that:

- The ESPPU will conclude in May 2020. Should the outcome allow the continued development of nuSTORM, the likely timetable would be to begin to seek the resources to deliver a detailed design study in the summer of 2020;
- The nuSTORM neutrino-nucleus scattering programme would be of most benefit if nuSTORM was in operation when the DUNE and HyperK oscillation analyses have begun to be systematics dominated;
- The nuSTORM light-sterile-neutrino (and exotic) search programmes will begin when the Short Baseline Neutrino programme at FNAL has been in operation for a number of years; and that
- The Muon Collider R&D programme at nuSTORM should be of benefit to the 'proton-driven' and the 'positron-driven' Muon Collider options.

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References

[1] R. K. Ellis, B. Heinemann, J. de Blas, M. Cepeda, C. Grojean, F. Maltoni, A. Nisati, E. Petit, R. Rattazzi, W. Verkerke, J. D'Hondt, K. Redlich, A. Andronic, F. Siklr, N. Armesto, D. Boer, D. d'Enterria, T. Galatyuk, T. Gehrmann, K. Kirch, U. Klein, J.-P. Lansberg, G. P. Salam, G. Schnell, J. Stachel, T. Pierog, H. Wittig, U. Wiedemann, B. Gavela, A. Zoccoli, S. Malvezzi, A. Teixeira, J. Zupan, D. Aloni, A. Ceccucci, A. Dery, M. Dine, S. Fajfer, S. Gori, G. Hiller, G. Isidori, Y. Kuno, A. Lusiani, Y. Nir, M.-H. Schune, M. Sozzi, S. Paul, C. Pena, S. Bentvelsen, M. Zito, A. D. Roeck, T. Schwetz, B. Fleming, F. Halzen, A. Haungs, M. Kowalski, S. Mertens, M. Mezzetto, S. Pascoli, B. Sathyaprakash, N. Serra, G. F. Giudice, P. Sphicas, J. A. Maestre, C. Doglioni, G. Lanfranchi, M. D'Onofrio, M. McCullough, G. Perez, P. Roloff, V. Sanz, A. Weiler, A. Wulzer, S. Asai, M. Carena, B. Dbrich, C. Doglioni, J. Jaeckel, G. Krnjaic, J. Monroe, K. Petridis, C. Weniger, C. Biscari, L. Rivkin, P. Burrows, F. Zimmermann, M. Benedikt, P. Campana, E. Gschwendtner, E. Jensen, M. Lamont, W. Leemans, L. Rossi, D. Schulte, M. Seidel, V. Shiltsev, S. Stapnes, A. Yamamoto, X. Lou, B. Vachon, R. Jones, E. Leogrande, I. Bird, S. Campana, A. Cattai, D. Contardo, C. D. Via, F. Forti, M. Girone, M. Kasemann, L. Linssen, F. Sefkow, G. Stewart, H. Abramowicz, and R. Forty, "Physics Briefing Book: European Strategy for Particle Physics Preparatory Group," Tech. Rep. CERN-ESU-004, Geneva, 2019.
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