

TLEP News

No 3, September 2013

Editors:

TLEP Steering group

Online version:

<http://tlep.web.cern.ch>

TLEP at work and play

Editorial

Sometimes it is easy to forget that TLEP is such a young idea. It is less than two years since the first paper by Blondel and Zimmermann came out. Yet, in these few months, progress has been impressive. Growing up comes with responsibilities of course, and TLEP is about to enter the next step in its life: getting integrated with the long-term CERN planning and vision, while still keeping, we hope, the freshness that has served it so well during this initial period.

Summer's almost gone

And what a busy and productive summer it has been! The TLEP community was kept busy with the fifth TLEP workshop at Fermilab, with providing material for the Snowmass process, attracting new collaborators...

The fifth TLEP Workshop

For the 5th TLEP Workshop we benefited of from the warm hospitality of the LPC (LHC Physics Center) at Fermilab (and DOE sponsoring for this event). For two days at the end of July, about 90 participants from the TLEP community, merging European and USA colleagues, met in the Wilson Hall to discuss the initial steps that would make the Design Study Project a reality. The full agenda <http://indico.fnal.gov/conferenceDisplay.py?confId=6983> was based on two mornings of theoretical and experimental perspectives, plus an afternoon dedicated to machine issues.

One of the workshop highlights was an energizing presentation by Nima Arkani-Hamed (see slide) about the great opportunities offered by the whole package: TLEP precision physics followed by a 100 TeV pp collider.

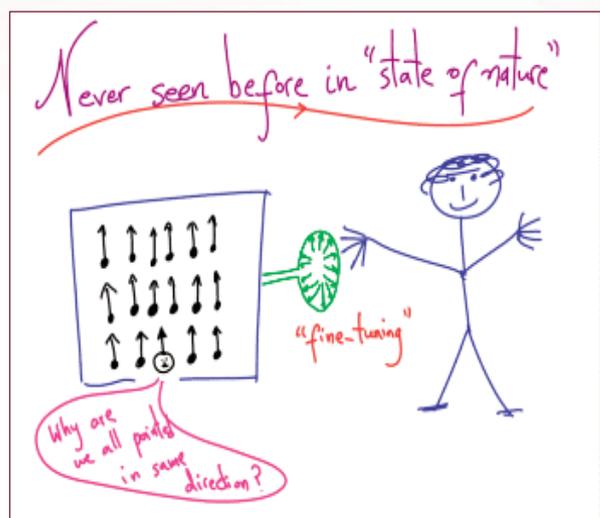


Figure 1: A slide from the refreshing talk given using legacy media by Nima. It depicts a TLEP study person fine-tuning Nature.

The strong participation of the theory community has helped to set a clear path towards a strong physics case for the TLEP project. The timing of the workshop, just a few days before the final Snowmass, was a key choice to grab the attention of the US community for this proposal. For those interested in a good summary, please look at the excellent presentation given as a Wine and Cheese seminar by Prof. C. Tully at the end of the Workshop to the wider Fermilab community: <http://indico.fnal.gov/getFile.py/access?contribId=25&resId=1&materialId=slides&confId=6983>

ISHP2013 in Beijing

IHEP hosted an interesting International Symposium on Higgs Physics in August (<http://ishp2013.ihep.ac.cn>), and TLEP was represented by two talks by Frank Zimmermann and Mike Koratzinos. Closer collaboration with our Chinese colleagues is seen with enthusiasm from both sides, as Chinese physicists are also looking into circular Higgs factories.



Figure 2: Frank Zimmermann (right) and Mike Koratzinos (left), elevated for the occasion to the rank of 'expert' with IHEP colleague Qing Qin at the entrance of the Expert Restaurant at IHEP

TLEP's 300

The 300th signature of the TLEP study came on 20 August 2013. The three-hundred-times lucky collaborator is Baek Yongwook from the Gangneung-Wonju National University of South Korea. Big celebrations have been promised for the 500th collaborator to sign up!

The TLEP physics case

The Snowmass process in the US had a very beneficial effect on our project, as it served as the catalyst to put the whole physics case concisely in one document, and it triggered the emergence of new ideas for important physics measurements. A first version of the paper was submitted to the arXiv at the end of August, available at <http://arxiv.org/abs/1308.6176>.

Since then, all of you have been asked to contribute actively to the process by submitting your comments and, if you agree, sign up for the document now submitted for publication to the Journal of High Energy Physics (JHEP). A total of 40 people sent detailed comments to the article, ranging from pointing out typographical errors to proposing original work and text. The most up-to-date version is available online at <https://www.authorea.com/browse>. As you can see there, already 129 people from 64 institutions, 20 countries, and five continents have become co-authors of the paper. A new international collaboration is born.

New theoretical challenges

Among the theoretical challenges mentioned in this first look at the TLEP physics case are those of improving the accuracy of electroweak calculations to match the precision possible with the cornucopia of Higgs, Z and W bosons that TLEP will provide, as well as the opportunities TLEP will offer for studies of rare decays of b and c quarks and tau leptons, not forgetting the bosons themselves. In particular, a new generation of electroweak calculations will be needed, far more precise than those needed to interpret LEP data, and also much more accurate QCD calculations and simulations. Plenty to keep busy all theorists who are young at heart!

Power matters

Since submitting our IPAC paper (<http://arxiv.org/abs/1305.6498>) our published TLEP power consumption figures have been the subject of intense scrutiny from our accelerator colleagues around the world. This necessitated a new explanatory note from our part (<http://arxiv.org/abs/1308.2629>). It is nice to see constructive criticism on all aspects of our design and we are looking forward to this kind of competition with other projects.

TLEP around the world in 80 seconds

Mexico

The TLEP contingent in Mexico is growing ever stronger, setting a shining example that the rest of Latin America could aim to follow. No fewer than 10 Mexican collaborators have joined the design study, eight of whom are members of the Mexican funding agency. In early September, Frank Zimmermann gave a well-attended talk at CINVESTAV in Merida. Humberto Maury Cuna – from this institute – will present TLEP at the upcoming XIVth Mexican Workshop on Particles and Fields, where he expects to attract further interest from the Mexican High Energy Physics community.

Korea

Possibly triggered by the talks of Patrick Janot last August in Seoul and Gangneung, the South Korean HEP community has expressed its interest in committing to substantial work on TLEP detector simulations in the framework of GEANT V. Its project leader, Federico Carminati, a TLEP study signatory, gave a presentation to one of the TLEP steering group meetings. The initiative of South Korea was met with excitement and enthusiasm, and we are all looking forward to a formal agreement in the framework of CERN-Korea collaboration.

Working groups and conveners: What's going on?

Back in July, you were all prompted to send nominations for the TLEP Design Study Working-Group conveners. We received a lot of suggestions, but we all need to be patient for a little while longer: CERN is about to launch a “Future Circular ColliderS Design Study”, in which all colliders that would fit in a large tunnel in the Geneva area are to be explored, in particular TLEP and the 100TeV VHE-LHC. A global structure is now being worked out. Watch this space for news in the very near future.

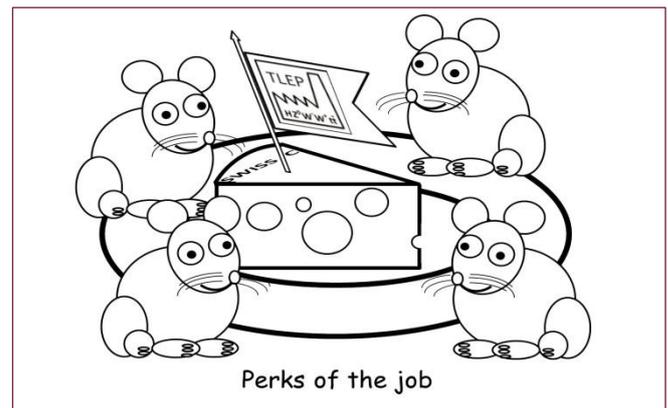
Upcoming events

The next TLEP workshop (TLEP6) will take place at CERN 16-18 October 2013. It will be the first meeting with plenary as well as parallel sessions. Details at <http://indico.cern.ch/conferenceDisplay.py?confId=257713>.

An IOP half day on TLEP will take place at University College London on 29 October, an occasion for UK folks to discuss TLEP and possible involvement. See the [TLEP indico site](#) link.

On 12-14 February 2014 there will be a kick-off meeting of the very long tunnel electron and proton machine studies, organised by CERN. This will mark the beginning of a new era for the TLEP study project which will be integrated with the CERN structure. Stay tuned for details.

The TLEP cartoon corner



If you would like to contribute with your topical cartoon, please email mike@cern.ch