

the ILC Report to Snowmass 2021

M. E. Peskin
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The writing of the ILC white paper for Snowmass is in the final stages. Please check out the current version at:

<https://agenda.linearcollider.org/event/9135/>

The paper is about 350 pages long, with 726 references.

36 chapter editors have produced the various sections.

At this moment, there are about 440 signatories. If you are not there, please sign at the above site, and also send me email to be included in the arXiv v1.

It is said quite clearly at the above site: Signature is endorsement, not a sign that you have done work. Also, signature is not exclusive of other Higgs factory proposals.

Our goal is to provide a complete survey for all aspects of ILC, including:

physics case

organization of the ILC IDT

machine design and future of SRF

detectors for ILC

experimentation and expected precisions

precision electroweak

BSM searches and fixed target program

SMEFT global fit to ILC data

theoretical interpretation

possible future facilities at the ILC Lab after ILC

new features of the ILC appearing in this document are:

discussion of **R&D on superconducting RF** and future possibilities (Hasan Padamsee)

report on **Green ILC** (Takayuki Saeki)

expanded discussion of **QCD** (Ian Moulton)

expanded discussion of **BSM models** (Mikael Berggren and BSM conveners; more material will be added soon)

expanded section on **theory implications** (MEP, so far, but much input from Nathaniel Craig will be added soon)

first discussion of the **future of the ILC Lab after ILC**

Three of the important highlights

BSM, QCD, Green ILC

will be presented in this meeting.

If we are lucky and the political standing of ILC in Japan becomes positive on the time scale of P5, we will have a report explicitly supporting ILC that will be very useful to them.

If we are unlucky and there is no progress on the timeline of the P5 panel, this report will be a general endorsement of Higgs factory physics. Most of it --- except the sections specifically on SRF --- applies to all Higgs factory proposals. Advantages of beam polarization available at linear colliders are explained.

We are on track to post this paper on the arXiv early next week.

We will continue to update this report, even after the Snowmass CSS meeting in Seattle. Please send me any comments, corrections, or suggestions for further work.