

# EPS-HEP Conference 2021

European Physical Society conference on high energy physics 2021

Online conference, July 26-30, 2021

- Web page: <https://indico.desy.de/event/28202/>
- Plenary and review talks already announced
  - talk on Future Collider Projects by Lenny Rivkin
  - but nothing more related to LC/ILC/ILD...
- Deadline for parallel session abstracts: May 7<sup>th</sup>
- Proposals for “overview” ILC talks from IDT-WG3

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## Parallel sessions:

- Astroparticle and Gravitational Waves
- Cosmology
- Dark Matter
- Neutrino Physics
- Heavy Ion Physics
- QCD and Hadronic Physics
- Top and Electroweak Physics
- Flavour Physics and CP Violation
- Higgs Physics
- Searches for New Physics
- Quantum Field and String Theory
- Detector R&D and Data Handling
- Accelerators for HEP
- Outreach, Education and Diversity

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Parallel sessions: planned IDT-WG3 “overview” abstracts

- Astroparticle and Gravitational Waves
- Cosmology
- **Dark Matter (1)**
- Neutrino Physics
- Heavy Ion Physics
- QCD and Hadronic Physics
- **Top and Electroweak Physics (1)**
- **Flavour Physics and CP Violation (1)**
- **Higgs Physics (2)**
- **Searches for New Physics (1)**
- Quantum Field and String Theory
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- We should make sure that all relevant ILD results are included in overview abstracts (→ talks)
  - please have a look at the abstracts and let us know
- What is not covered by IDT-WG3 proposals
  - Detector R&D and Data Handling
  - Flavour Physics
  - QCD and Hadronic Physics
  - We could consider additional ILD “overviews”
- Abstracts focused on single analysis are still encouraged
  - please let us know (within ~2 weeks)  
should still be coordinated by PSB...

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## HIGGS PHYSICS

- ILC Higgs physics potential

Higgs factories based on  $e^+e^-$  colliders have the potential to measure the complete profile of the Higgs boson at a level of precision that goes qualitatively beyond the expect capabilities of the LHC. This talk will review the program of Higgs boson coupling measurements expected from the International Linear Collider, including the most recent updates. These measurements span the range of  $e^+e^-$  CM energies from 250 GeV to 1 TeV and include precision measurements of the top quark Yukawa coupling and the Higgs self-coupling.

- Higgs invisible and rare decays at ILC (\*)

\* - optional

The operation of an  $e^+e^-$  collider at a CM energy of 250 GeV will yield a large sample of Higgs bosons that are tagged by recoil against an observed Z boson at a fixed laboratory energy. By selecting these Z bosons and looking on the other side of the event,  $e^+e^-$  colliders will be sensitive to essentially all possible rare and exotic Higgs boson decay channels, in most cases down to branching ratios of order  $10^{-4}$ . This includes channels important for theories beyond the Standard Model such as  $H \rightarrow b \bar{b} + (\text{missing energy})$  and  $H \rightarrow b \bar{s}$  that are very difficult to observe at the LHC. This talk will review the expectations for the discovery of new decay modes of the Higgs boson at the International Linear Collider.

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## TOP AND ELECTROWEAK PHYSICS

- t-quark physics at ILC

The top quark has not yet been studied in the extremely favorable and low-background environment of  $e^+e^-$  annihilation. This talk will review the opportunities for precision measurements of the top quark properties at the International Linear Collider. These include the archival measurement of the top quark mass, the search for beyond-Standard-Model contributions to the top quark electroweak form factors, and the search for CP violation in the top quark couplings.

## DARK MATTER

- Probing dark matter with ILC

The International Linear Collider offers a number of unique opportunities for searches for dark matter and dark sector particles. The collider program will offer important capabilities, for example, in the study of  $e^+e^- \rightarrow \gamma + (\text{missing})$ . But also, the ILC will enable new fixed-target experiments using the high-energy electron and positron beams, both beam dump experiments and dedicated experiments using single beams. This talk will describe the expectations for these programs, which address all of the possible dark sector portals.

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## SEARCHES FOR NEW PHYSICS

- New physics searches at ILC (\*)

Although the LHC experiments have searched for and excluded many proposed new particles up to masses close to 1 TeV, there are many scenarios that are difficult to address at a hadron collider. This talk will review a number of these scenarios and present the expectations for searches at an electron-positron collider such as the International Linear Collider. The cases discussed include the light Higgsino, the stau lepton in the coannihilation region relevant to dark matter, and heavy vector bosons coupling to the s-channel in  $e^+e^-$  annihilation.

## FLAVOUR PHYSICS AND CP VIOLATION

- CP violation in the Higgs sector at ILC (\*)

Baryogenesis in the early universe requires a new source of CP violation beyond that in the CKM model. Perhaps the most promising place to look is in the Higgs sector. Though the Standard Model predicts that the couplings of the Higgs boson are exactly CP-conserving, more general models of the Higgs sector give many opportunities for CP violation. This talk will discuss the expectations for searches for these CP-violating couplings in the high-precision study of the Higgs boson at the International Linear Collider.



Backup slides