

# GUTs and Branes

DESY Theory Workshop 2003

A brief introduction to the future of particle physics at DESY

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# The Strategic Elements of DESY's Future

The strength of DESY lies in its structure:



Current Projects:

HERA

DORIS

VUV-FEL

Upgrade Project: PETRA SR

European Facility:

TESLA X-FEL

Planned Global Project:

TESLA LCC

## Government Decision

The decisions of the German Ministry for Education and Research concerning TESLA was published on 5 February 2003:

Germany is willing to carry half of the 673 MEuro investment cost for a European XFEL Facility in Hamburg

Today, no German site for the TESLA linear collider is being put forward.

This decision is connected to plans to operate this project within a world-wide collaboration

DESY will continue its research work on TESLA in the existing international framework, to facilitate German participation in a future global project

## Statement by the German Government on LC

Dr. H. Schunck, EPS HEP conference in Aachen, July 2003:

“The TESLA linear collider has been one of the proposals evaluated by the Wissenschaftsrat. The judgement of the Wissenschaftsrat on the scientific perspectives of the project has indeed been **very positive**. The Wissenschaftsrat has **strongly suggested** that the linear collider should be **realized as a genuine global project**.

The German government has decided to **follow this** and as a consequence **not to proceed nationally** and at this moment not to propose a German site for TESLA. We have to **wait for the international development**. But we will continue our efforts to be able to participate in a global linear collider project. **Let me underline: my government is the first one to have announced to be principally committed to participating in the project.** “

# VUV-FEL User Facility at TTF II



**TTF 1** 250 MeV

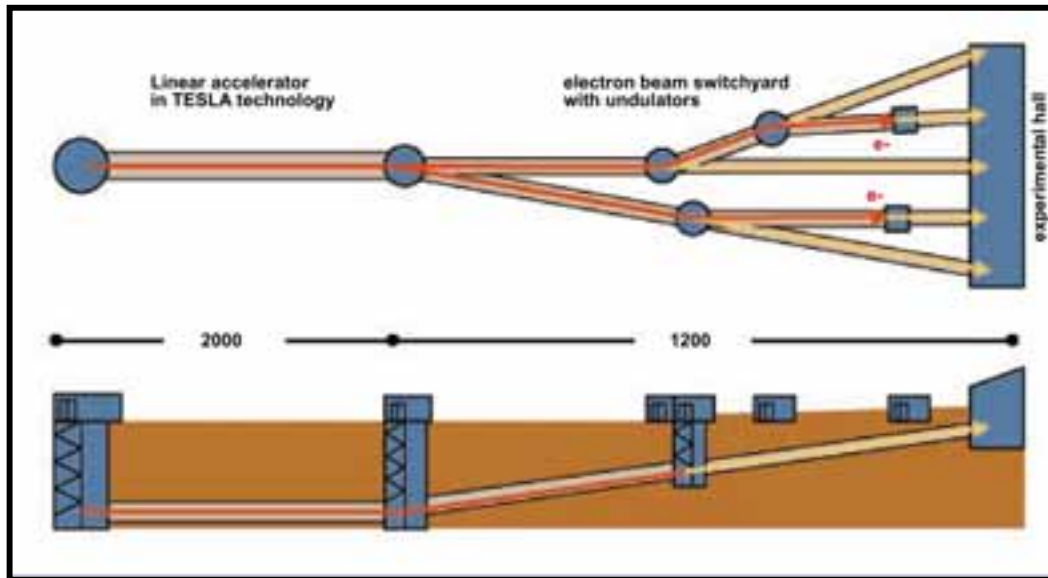
**TTF 2** 1 GeV

**experimental hall**

Commissioning ongoing

Start as user facility end  
of 2004

# X-FEL



- DESY has established a XFEL project group
- Location and technical specifications are under reconsideration
- **Goal: Government decision on construction in 2005!**
- Start of operation ~2011

- European project, 50% of funding from BMBF
- BMBF in contact with other European ministries
- European Strategy forum on Research Infrastructure

## LC: What has Happened Recently?

- Meeting of **funding agencies** in July
- **ILCSC** meeting in August
- Final report of European WG on **organisational matters**
- **Technology choice**: Selection of Wise Persons converging
- International agreement on **basic parameters** converging
- Ongoing discussion on European and Global **design teams**

# The Scientific Case

...The theme: see 'Consensus document'

[http://sbhep1.physics.sunysb.edu/~grannis/wwlc\\_report.html](http://sbhep1.physics.sunysb.edu/~grannis/wwlc_report.html)

## Understanding Matter, Energy, Space and Time : The Case for the $e^+e^-$ Linear Collider

A world-wide consensus has formed for a baseline LC project in which *positrons* collide with *electrons* at energies up to **500 GeV**, with *luminosity* above  $10^{34} \text{ cm}^{-2}\text{s}^{-1}$ .

The energy should be upgradable to about 1 TeV.

Above this firm baseline, several options are envisioned whose priority will depend upon the nature of the discoveries made at the LHC and in the initial LC operation.

The consensus document is presently being signed by scientists all around the world. <http://www-flc.desy.de/lcsurvey/>



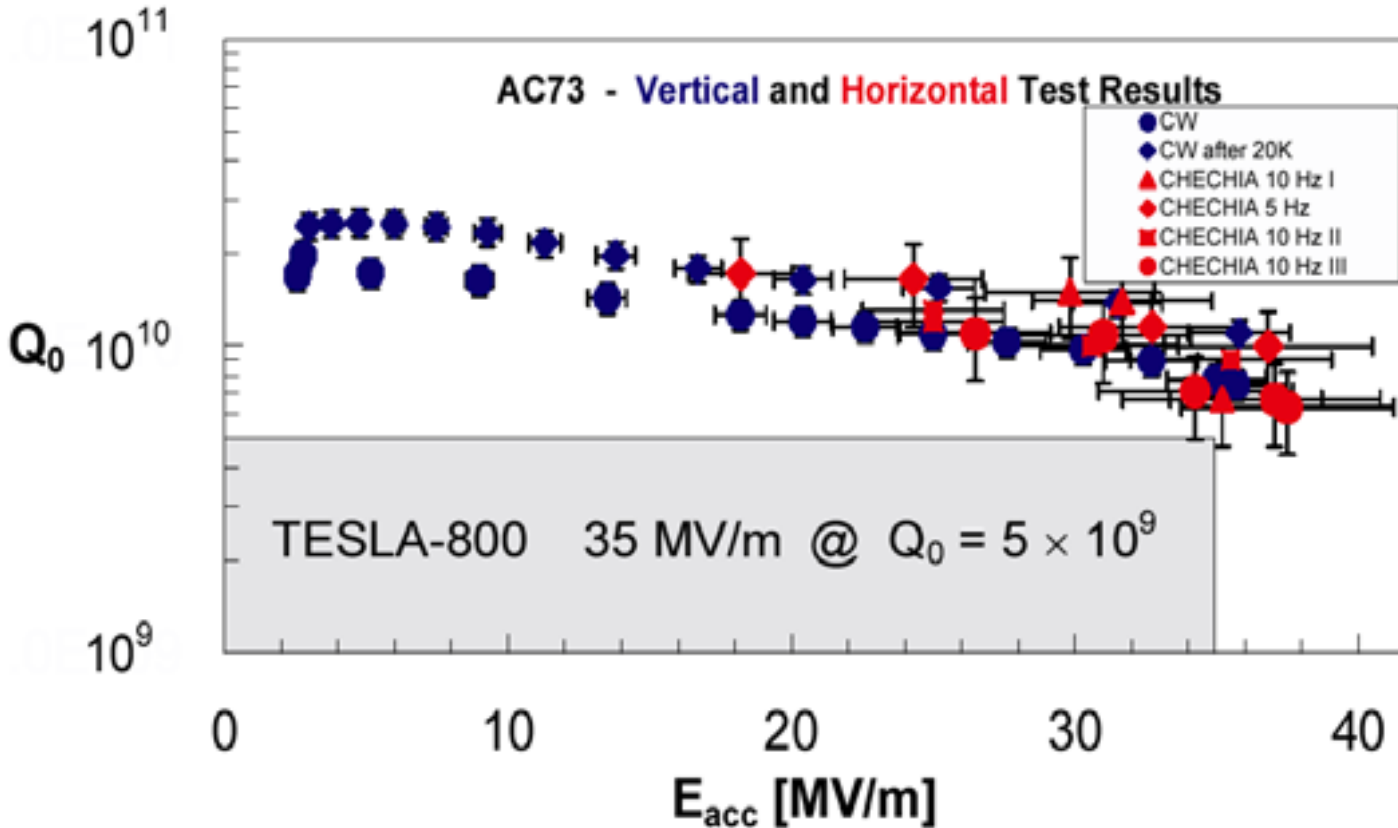
# Technology Decision

Decisive next step: joint selection of **one** technology before the end of 2004.

- Gather a **committee of wise persons**, who use criteria to be developed by the ILCSC, to recommend a technology choice to the ILCSC.
- The regional steering committees are in the process to nominate **4 persons**, the ILCSC will choose from this list the chair. Advice was widely sought from the community.

Names will be on the table by **end of September**, committee to start work **beginning 2004**.

# High Power Test of a complete EP nine-cell cavity



Very important  
for choice of  
technology

- 1/8th of a TESLA cryomodule
- 5 Hz, 500  $\mu$ s fill, 800  $\mu$ s flat-top
- **>35 MV/m** with no interruption related to cavity-coupler-klystron for more than **1000** hours

## Meeting of Funding Agencies

**Meeting of Funding Agencies to discuss the status and funding prospects for a linear collider of 0.5 - 1TeV.**

**30 July 2003, London, UK**

Representatives from Canada (NSERC), CERN (President of Council and DG), France (CNRS), Germany (BMBF), Italy (INFN), UK (PPARC), and the US (DOE, NSF, OSTP).

... The group believed it **important** that the **technology choice** report to be made by the International Committee for Future Accelerators (ICFA) group should be **completed in a timely manner**, on its proposed timescale by the **end of 2004**.

The group agreed to hold **a further informal meeting in February/ March 2004** at which it hoped that representatives of the Asia area could be present.

## Next Milestones towards a Global Linear Collider

- 2004 Selection of Collider **Technology** (warm or cold) and setting up of an international project team with branches in America, Asia and Europe
  - Continuation of discussion between funding agencies
  - Further studies of organisation structures
- 2005 Start of work of project teams („Pre GLC“)
- 2006 Completion of the project layout including costing
- 2007 Decision in principle by governments to go ahead with LC
  
- 2015 Start of commissioning

# Conclusion

Continued dynamic development of all aspects which are based on the work of the TESLA collaboration and the TESLA TDR:

- Together with our TESLA partners we want to design and build the XFEL
- The success of VUV-FEL will play a major role in convincing scientists and politicians that FELs are the way into the future
- The LC has moved into a truly global discussion
- The outstanding milestone is the technology choice
- DESY will play a leading role in the LC independent of the choice of technology