Future Electron-Positron Linear Colliders

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XXVIII International Meeting on Fundamental Physics

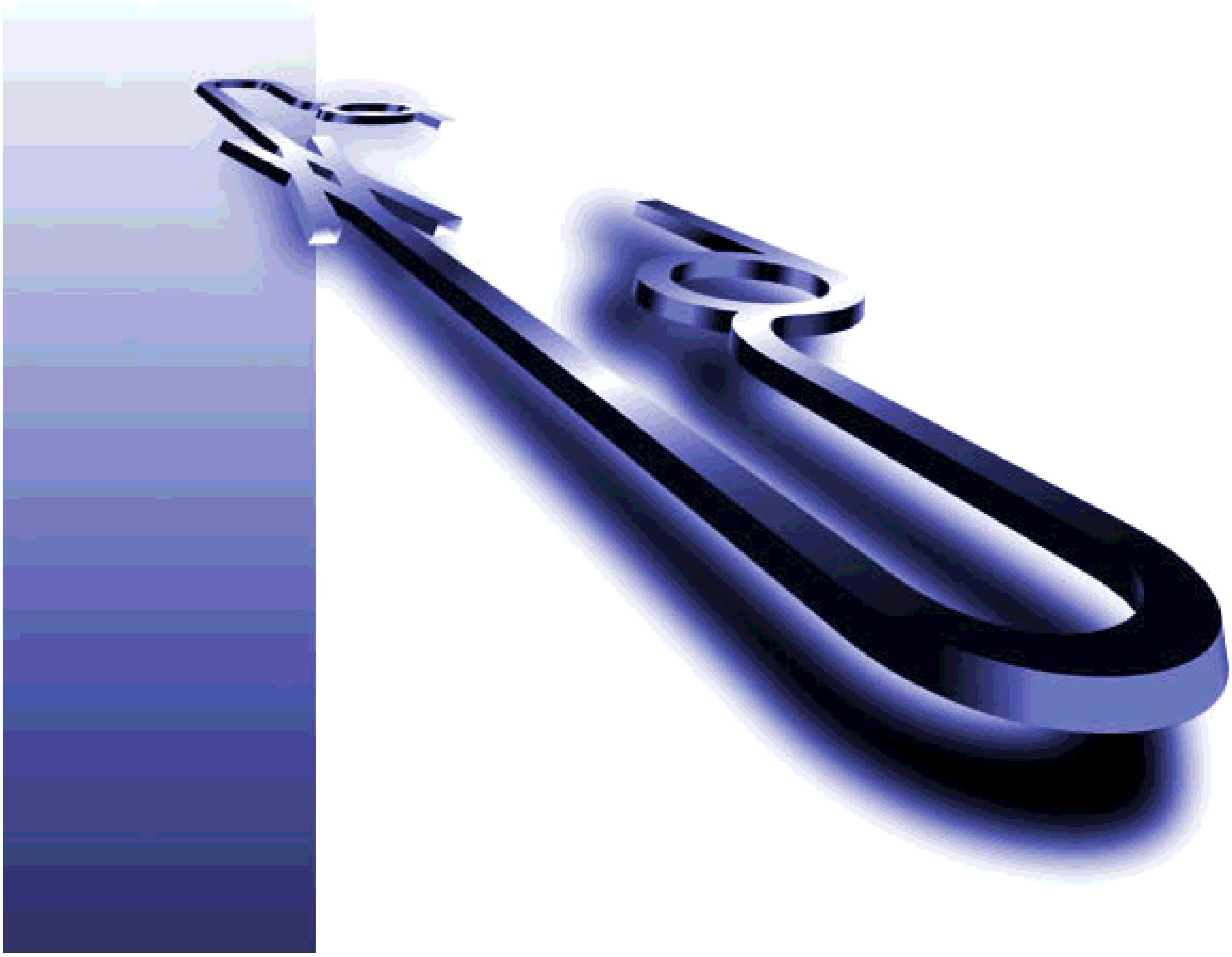
Sanlúcar de Barrameda, Cádiz, Spain

14-18 February 2000

Outline

- Yet another accelerator?
- Linear collider concepts:
  - Performance limitations
  - X-band vs superconducting technology
  - Polarisation
- Detector concepts and elements
- Standard Model physics:
  - Top quark physics
  - Electroweak measurements
  - Higgs properties
- Supersymmetry
  - SUSY Higgs sector
  - Missing SUSY particles
  - SUSY parameters
- Alternative new physics
  - Strong W rescattering
  - Extra dimensions
- Conclusions

Disclaimer



- Concentrate on European TESLA project
- Do not cover integrated high brilliance X-ray laser facility (FEL)
- Only cover electron-positron mode, not $e\gamma$ and $\gamma\gamma$ options

Acknowledgements

Material from:

ECFA DESY
Linear Collider Workshop

Worldwide Study of
the Physics and Detectors
for Future Linear
$e^+ e^-$ Colliders

Saariselkaa (Finland) 1991
Waikoloa (Hawaii) 1993

1$^{\text{rst}}$ Workshop 1996 — Morioka (Japan) 1995
2$^{\text{nd}}$ Workshop 1998/99 — Sitges (Spain) 1999

Most material from:
TESLA CDR, R. Brinkmann et al., DESY 1997-048
`//www-mpy.desy.de/lc-cdr/tesla/tesla.html`
Sitges Workshop 1999:
`//www.cern.ch/Physics/LCWS99/`
Obernai Workshop 1999:
`//ireswww.in2p3.fr/ires/ecfadesy/index.html`

And also:

- colleagues from TESLA project, R. Heuer
- colleagues from LEP experiments
- LEP electroweak working group

Yet Another Accelerator?

Exploitation of current generation not finished: