

Electra at LEP
and
SDC at the SSC
or

‘The ones that got away’

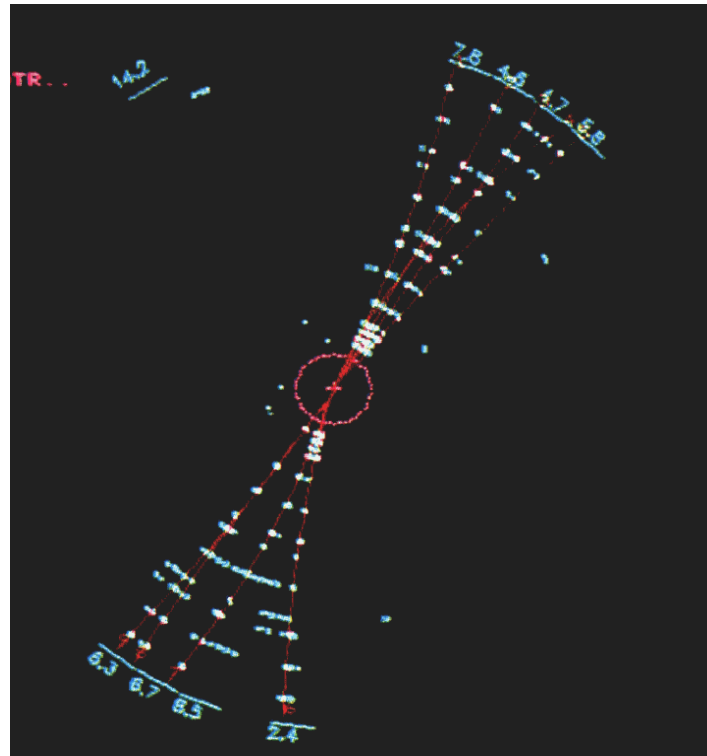
Roger Cashmore CMG, FRS

The Historical context 1

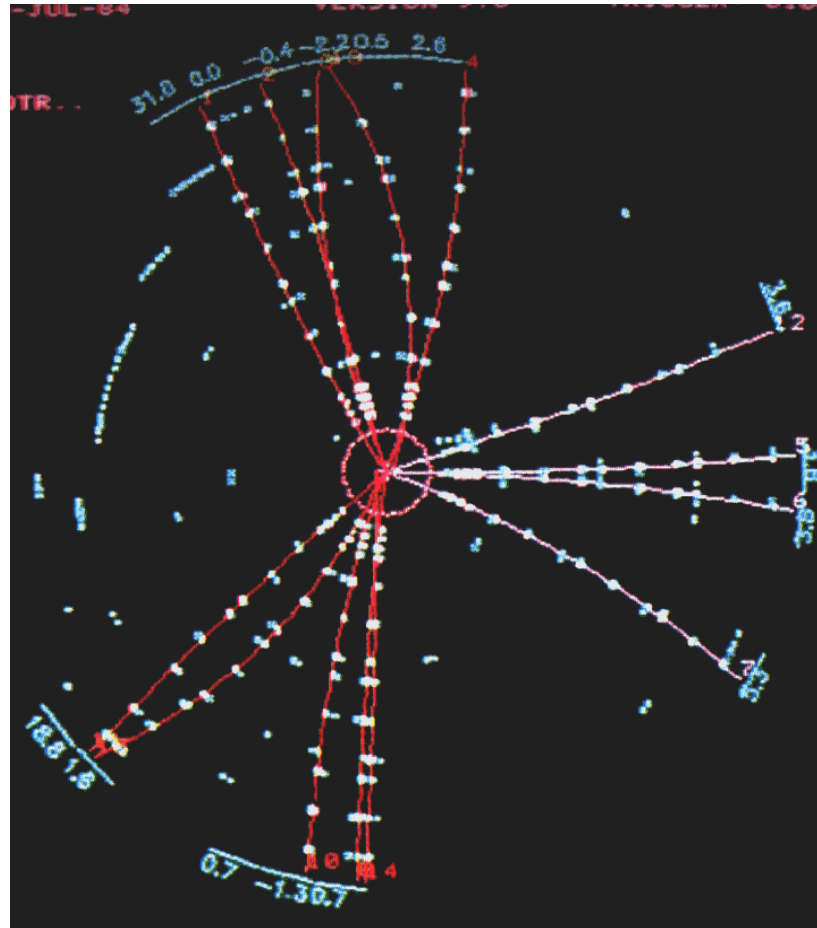
- 1970's Very successful e+e- colliders .. SPEAR,PETRA , PEP, DORIS, CESR, SppS at CERN
- Discovery of c, tau and b and g, W and Z
- Designs of detectors refined Mainly solenoids with cylindrical detector systems

Quarks and Gluons and Taus in TASSO

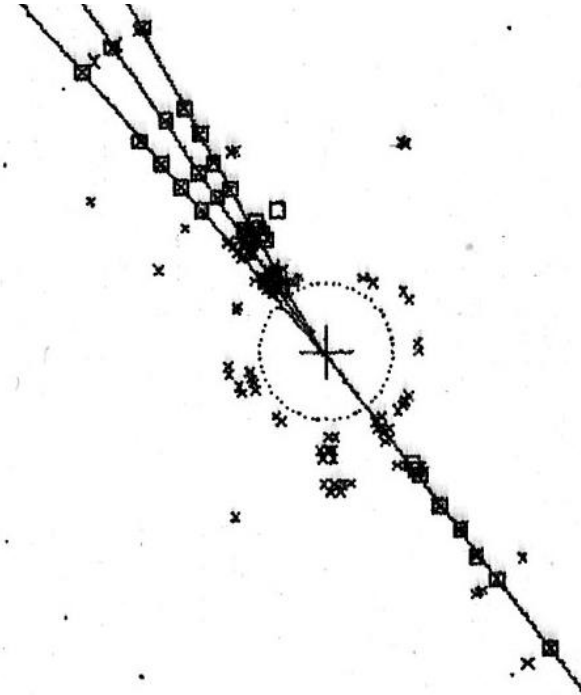
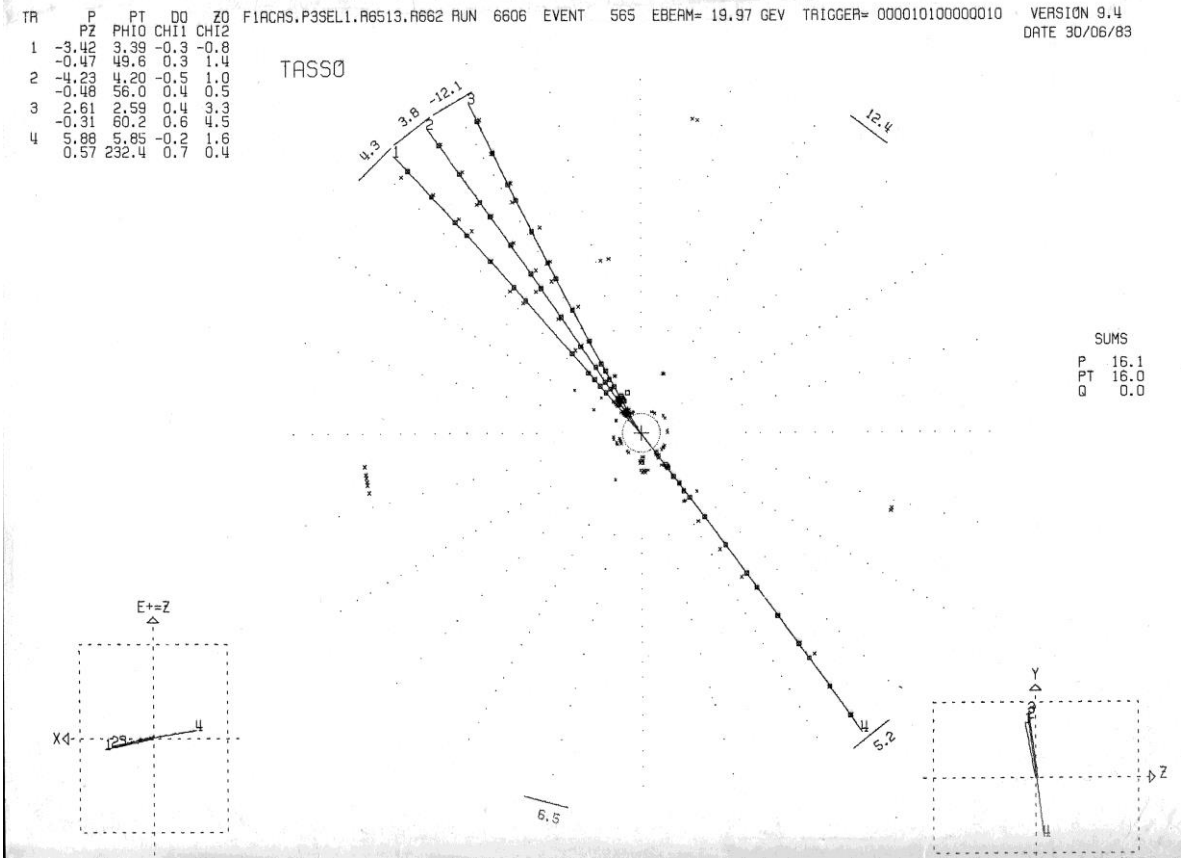
Quarks



Gluons



Tau lepton



The Historical context 2

- Study W,Z and possibly discover Higgs and top quark
- Led to Tevatron, LEP, and the SSC/LHC
- 1976 ... B.Richter first proposed LEP (in NIM article)
- 1985 ... SSC proposed in US
- 1980's ... LHC at CERN

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Electra

Appendix

Participants

Spokesman - R.J. Cashmore, Oxford

Austria

Institut für Hochenergiephysik
der Österreichischen Akademie
der Wissenschaften, Vienna

W Bartl
G Leder
F Mandl
W Mitaroff
G Neuhofer
M Pernicka
+ 6 others

(ii) Tel Aviv University

G Alexander
G Bella
J Grunhaus
A Levy
+ 1 other

(ii) Imperial College, London

T C Bacon
R Beuselinck
W Cameron
P J Dornan
A Duane
J G McEwen
G Hall
W G Jones
S L Lloyd
J K Sedgbeer
I Siotis
D M Websdale
A P White

(vi) Rutherford Appleton Laboratory

P T Clee
B Foster

J C Hart

J Proudfoot

D H Saxon

P L Woodworth

+ 2 others

(iv) Oxford

M G Bowler

R J Cashmore

R C Devenish

P Grossmann

J G Loken

R Mount

P Renton

G L Salmon

W S C Williams

C Youngman

Electra

CERN LIBRARIES, GENEVA



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L.E.P.C./L1(5)

82-7

ELECTRA

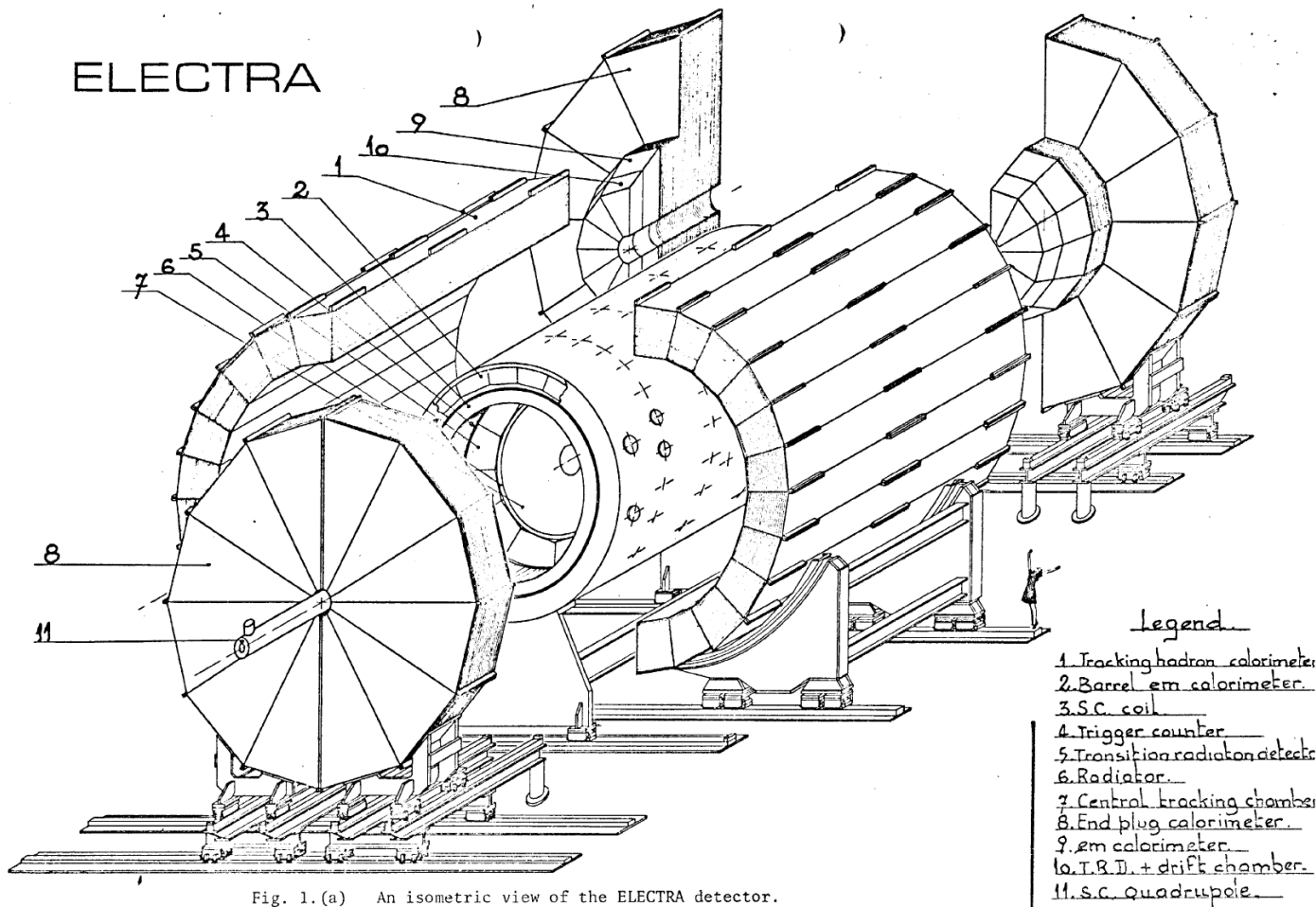
CERN
BIBLIOTHEQUE
SCP
CERN LEPC
82-7

LETTER OF INTENT TO STUDY e^+e^- ANNI

The ELECTRA Collaborat:

Aachen, Belgium, Cambridge, CERN, Clermc
Hamburg, Imperial College, LAPP, Liverpc
Oxford, Queen Mary College, Rome, Rutherf
Tel Aviv, Vienna, Weizmann

(31 January 1982)



Legend

1. Tracking hadron calorimeter.
2. Barrel em calorimeter.
3. S.C. coil
4. Trigger counter
5. Transition radiation detector
6. Radiator
7. Central tracking chamber
8. End plug calorimeter
9. em calorimeter
10. T.R.D. + drift chamber
11. S.C. quadrupole

Fig. 1. (a) An isometric view of the ELECTRA detector.

After ELECTRA

- 4 expts accepted for the 4 interaction regions at LEP

- ALEPH, DELPHI, L3, OPAL

- Benefits to other LEP experiments

RAL S/C magnet group DELPHI

IC group ALEPH

After ELECTRA

ep DIS, proton structure, QCD and EW(NC/CC) unification

HERA (BW) and ZEUS (GW)

96nsec ep crossing time

UK provided central tracker (borrowing from CDF)

and also

developed pipelined electronics and trigger

(BF and Peter Sharp/RAL)

The SSC in the USA

- A High Energy p p collider was proposed in 1984/85 and eventually approved
- This was the Superconducting Super Collider (a name coined by D.Jackson)
- The energy was to be 20 Tev x 20 Tev

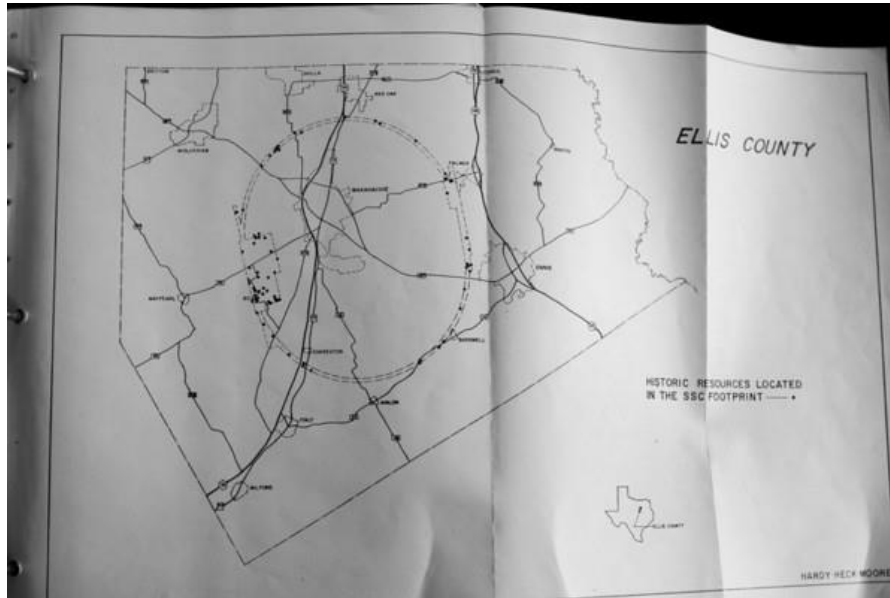
SSC in Texas

- Very High Energy(20x 20 Tev) pp collisions
- 54 mile circumference! (cf FCC at CERN)
- Roy Schwitters (Project Leader/Director)
- A 'green field' site was chosen near

Waxahachie in Texas

the state providing support in attracting the project

- Construction and tunnelling was begun ~1990







Constructing the tunnel

SSC Dipole Magnets



UK involvement in the SSC

- UK joined the
Solenoid Detector Collaboration (SDC)
- to propose and help construct an all purpose detector exploiting experience from

PETRA and HERA
and
H1 and ZEUS

SDC

Members of the Solenoidal Detector Collaboration

Argonne National Laboratory: E. L. Berger, R. E. Blair, J. W. Dawson, M. Derrick, T. H. Fields, V. Guarino, N. F. Hill, P. K. Job, T. B. W. Kirk, E. N. May, J. Nasiatka, L. J. Nodulman, L. E. Price, J. Proudfoot, H. M. Spinka, R. L. Talaga, D. G. Underwood, R. G. Wagner, A. B. Wicklund

University of Arizona: K. A. Johns

Beijing University, China: He Yu Ming, Lai Chu Xi, Liu Hong Tao, Liu Song Qiu, Lou Bing Qiao, Yang Ji Xiang, Yao Shu De, Zhang Re Ju

Institute of High Energy Physics, Beijing: H. Cui, C. Gao, M. Gao, W. Gao, S. Gu, H. Hu, D. Huang, W. Li, N. Liu H. Mao, H. Ni, N. Qi, G. Rong, H. Shi, S. Tang, P. Wang, T. Wang, X. Xie, S. Xue, W. Yan, M. Ye, Ge. Zhang, W. Zhao, L. Zheng, Y. Zhou, Q. Zhu, Y. Zhu

Brandeis University: S. Behrends, J. R. Bensinger, P. Kesten, L. Kirsch

Bratislava State University, Czechoslovakia: P. Povinec, P. Strmen

University of Bristol: B. Foster, G. P. Heath

Lawrence Berkeley Laboratory: G. S. Abrams, H. Aihara, A. Barbaro-Galtieri, R. M. Barnett, L. P. Bautz, C. J. Bebek, R. N. Cahn, A. Ciocio, C. A. Corradi, C. Day, S. Dow, A. Dubois, P. H. Eberhard, W. R. Edwards, K. Einsweiler, T. Elioff, R. Ely, G. Gabor, M. G. D. Gilchriese, W. Greiman, D. E. Groom, C. Haber, C. Hearty, I. Hinchliffe, M. Hoff, R. Jared, R. W. Kadel, J. A. Kadyk, F. Kirsten, I. Kipnis, S. Kleinfelder, M. E. Levi, A. Lim S. C. Loken, N. Madden, O. Milgrome, J. Millaud, Y. Y. Minamihara, T. L. Moore, D. R. Nygren, E. Oberst, W. L. Pope, M. Pripstein, J. Rasson, D. Santos, B. Schumm, M. Shapiro, D. Shuman, H. G. Spieler, R. Stone, M. Strovink, W. Thur, G. H. Trilling, R. C. Weidenbach, W. A. Wenzel, S. Wonduke, M. Wong

University of Liverpool: T.J.V. Bowcock, J. B. Dainton, E. Gabathuler, T.J. Jones, S. J. Maxfield

16/09/2024

EECU and SDC

SDC

University of Oxford: J. Bibby, R. J. Cashmore, N. Harnew, R. Nickerson, W. Williams

Tel Aviv University: J. Grunhaus, R. Heifetz, A. Levy

SDC - 92 - 171
Report To Kondo Committee
January 20th, 1992

Intermediate angle Track Detector Conceptual Design Report

SDC ITD GROUP

B. Foster, C. P. Heath
University of Bristol

J. Armitage, P. Estabrooks
Carleton University

M. Dixit, M. Losty, F.G. Oakham, M. O'Neill
CRPP

T.J.V Bowcock, J.B. Dainton, E. Gabathuler

T. Jones, S. Kiourkos, S.J. Maxfield, J.M. Morton, G.D. Patel
Liverpool University

L. Hamel, J.P. Martin, L. Martinu, P. Taras, M.R. Wertheimer
Universite de Montreal

B. Brooks, R. Cashmore, N. Kundu, N. Martin, R. Nickerson, R. Wastie
Oxford University

I. Shipsey
Purdue University

A. Sill
University of Rochester

M. Edwards
Rutherford Appleton Laboratories

E. Barasch, R. Gaedke, P. McIntyre, Y. Pang, H.-J. Trost
Texas A&M University

R. Henderson, M. Salomon
TRIUMF

SDC @ SSC



Solenc
Detect
Collab

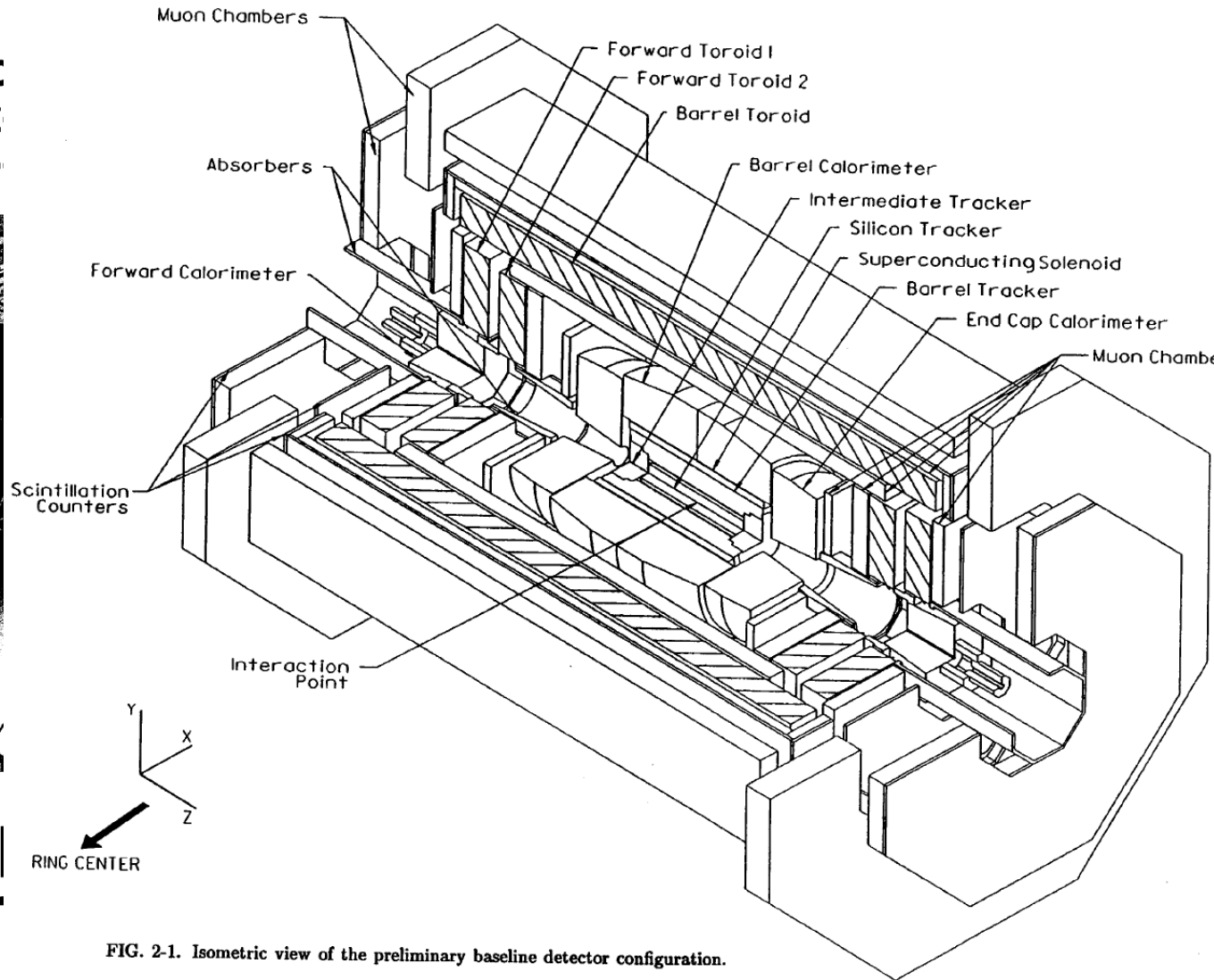
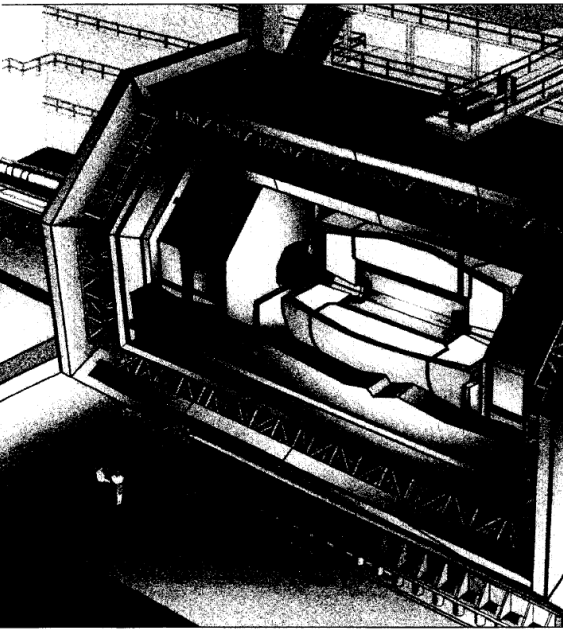


FIG. 2-1. Isometric view of the preliminary baseline detector configuration.

TECHNICAL D REPORT

1 April 1992

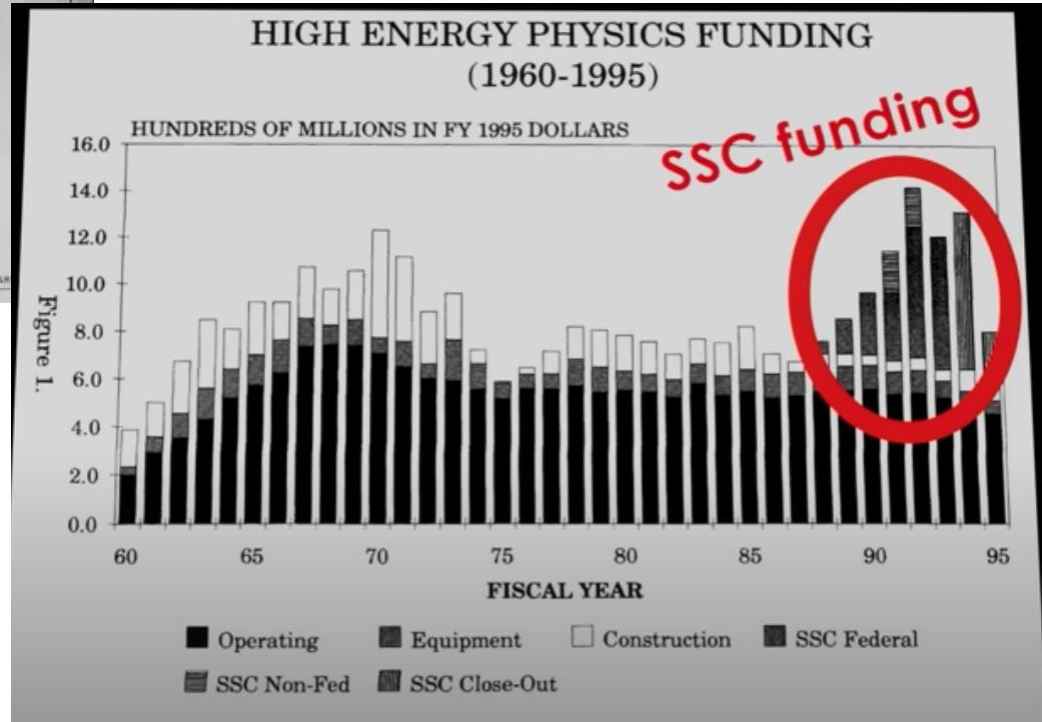
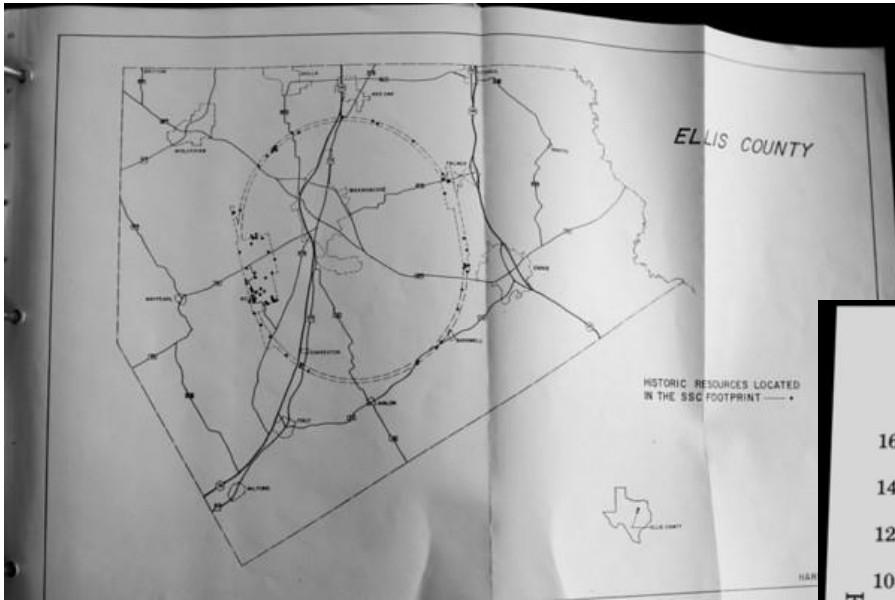
10/09/2024

Underestimating the politics!!

- US (Bush snr) attempted to get Japan to collaborate and contribute ~\$1.0B
- Unfortunately This Failed!!
- Texas was intending to contribute a large sum
- 1992 ... US Presidential Election .. Democrats/Clinton won
- Major arguments in US/Science circles in '93/'94
- In 1994 Clinton 'canned the SSC'
- This time the accelerator 'failed' not the expt !!

AND

- fortunately the LHC still 'existed' at CERN



Asking price for the SSC site in 2011 was \$6.5M.

Meanwhile in Europe

- AT CERN
- The LHC, a much lower energy machine, was promoted by Rubbia
- Later to be picked up and carried forward by Chris Llewelyn Smith and Lyn Evans
- And the **LHC in the LEP tunnel was eventually approved and BUILT**

- AT DESY
- Bjorn Wiik had decided to remain promoting S/C Rf cavities
- For use in a Linear Collider and/or FEL

??? An after thought ???

- Had Bush achieved a large Japanese contribution and/or Republicans won in 1992

We might already have had

a 20Tev pp collider

and

a ~ 80 km circumference tunnel

and

a high energy e+e- linear collider!!

In summary.... A few Friends

