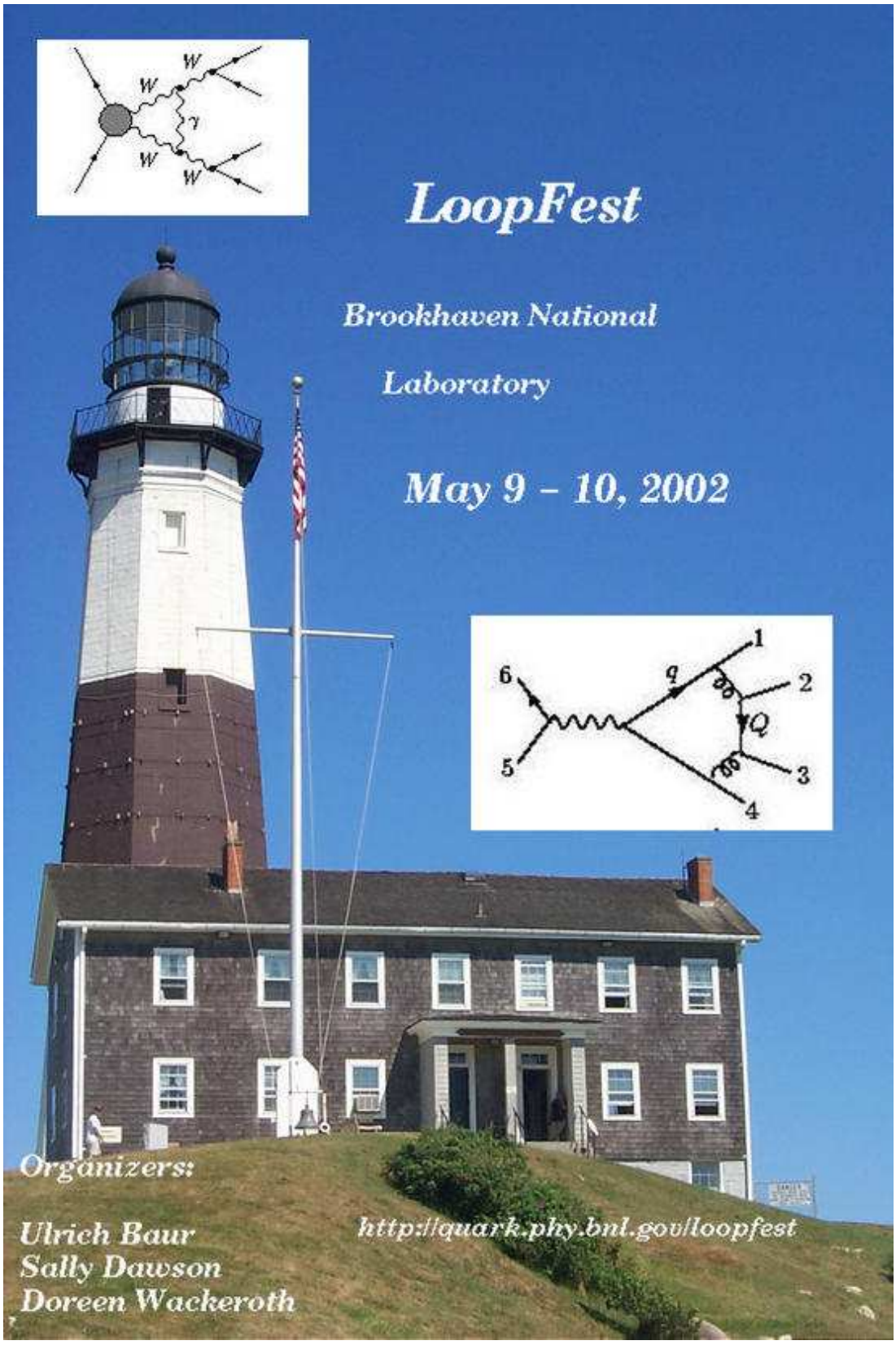
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LoopFest
Brookhaven National
Laboratory
May 9 – 10, 2002
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Organizers:
Ulrich Baur
Sally Dawson
Doreen Wackeroth
http://quark.phy.bnl.gov/loopfest

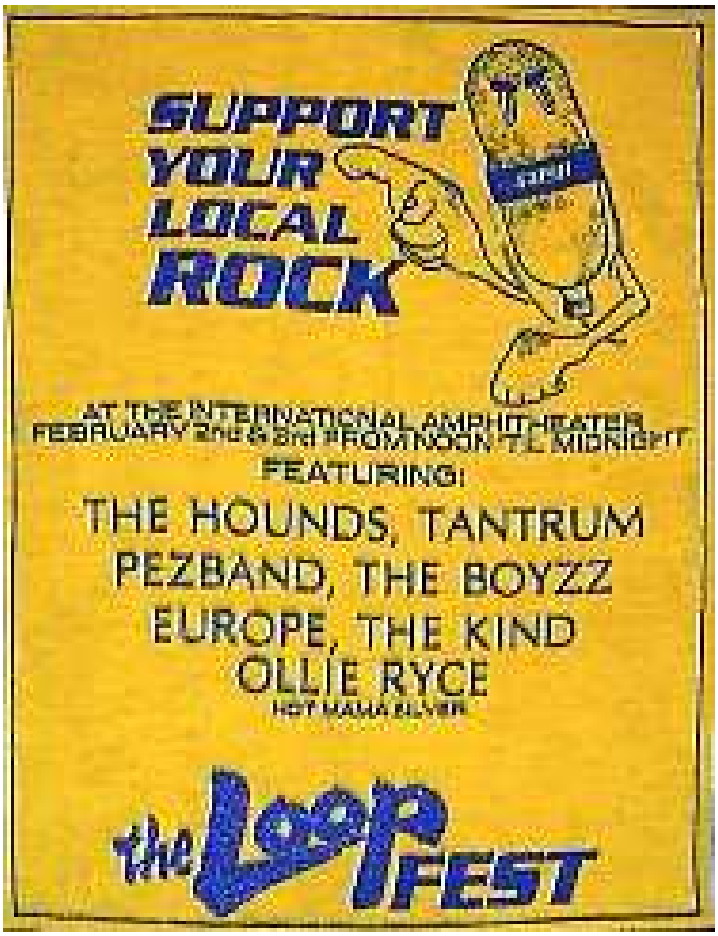
Welcome to the BNL LoopFest

May 9 – 10, 2002

- Why are we here?
- Consensus is emerging in the US High Energy Physics Community that an e^+e^- Linear Collider (LC) should be the flagship project of a comprehensive and international High Energy Physics program
- Three regions have organized a series of workshops with numerous working groups:
  - ☞ Asia: ACFA workshop
  - ☞ Europe: ECFA/DESY workshops
  - ☞ North America: North American Linear Collider Study

- The ECFA/DESY workshop has created a working group devoted to studying higher order corrections, dubbed The Loop-Verein
- The American Linear Collider Study recently reorganized:
  - ☞ new leadership: Jim Brau (Oregon) and Mark Oreglia (Chicago)
  - ☞ a steering group was formed
  - ☞ the working groups are being reorganized
- A counterpart to the Loop-Verein was formed
  - ☞ convenors: UB ("point person"), Sally Dawson, and Doreen Wackeroth (contact for 2002 LCWS workshop)

- of course this is not the first LoopFest ...
- the first loopfest took place in 1980



- motivation for this working group:

  ☞ the expected precision at a LC requires much more precise theoretical predictions

- Example: measuring M_W at GigaZ from a threshold scan

  ☞ back of envelope calculation:

  → statistical uncertainty: (Stirling)

$$\delta M_W^{stat} = 90 \text{ MeV} \left[\frac{\epsilon \int \mathcal{L} dt}{100 \text{ pb}^{-1}} \right]^{-1/2}$$

for $\epsilon = 0.67$ (efficiency) and $\int \mathcal{L} dt = 100$ fb^{-1}:

$$\delta M_W^{stat} \approx 3.5 \text{ MeV}$$

→ current theoretical uncertainties of cross section in threshold region: (CERN LEP2 Yellow Report):

$$\frac{\Delta\sigma}{\sigma} \approx 1.4\%$$

→ corresponding uncertainty in M_W:

$$\delta M_W^{sys} = 17 \text{ MeV} \left[\frac{\Delta\sigma}{\sigma} \times 100\% \right]$$

→ If theoretical uncertainties of cross section do not improve:

$$\delta M_W \approx \delta M_W^{theor} \approx 24 \text{ MeV}$$

sic transit gloria mundi ...

- purpose of this meeting:

  ☞ kick off activities of the Radiative Corrections Working Group ("American LoopVerein")

  ☞ get status of calculations in Europe and US

  ☞ foster (transatlantic) discussion and collaboration

  ☞ prepare for future meetings:

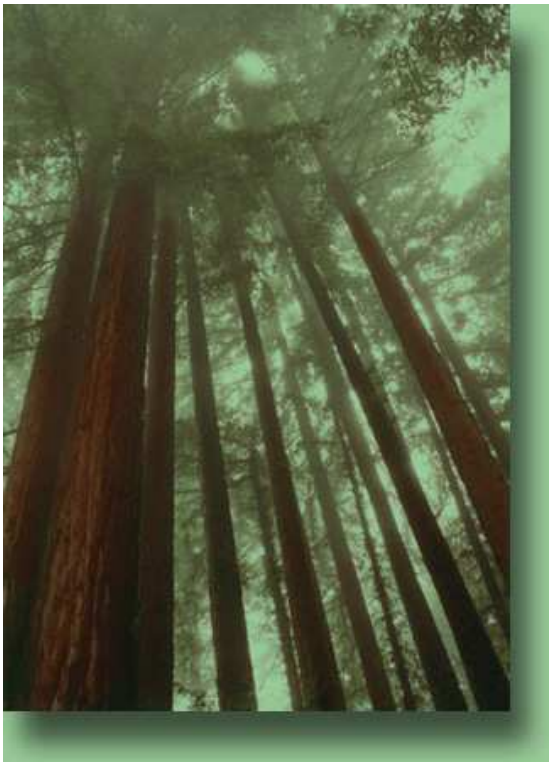
  → LCWS in Korea (August)

  → Linear Collider retreat in Santa Cruz (June 27 — 29)

Santa Cruz Linear Collider Retreat

June 27th - 29th 2002

University of California Santa Cruz



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Outreach Program
We Need Your Help!

Self Guided Historical and Geological Tour of UCSC

Last Update: April 12, 2002

SCIPP/UCSC
1156 High Street
Santa Cruz, CA 95064
(831) 459-2635
(831) 459-5777 (Fax)

Web Design:
Edward Hawkins

LoopFest

Brookhaven National Laboratory, Upton, NY

May 9-10, 2002

Program

Thursday, May 9, 2002		
8:30-9:00 am	Coffee in Orange Room, Physics Building	
Plenary session Small Seminar Room, Physics Building Chair: Sally Dawson		
9:00-9:30 am	Ulrich Baur	Welcome
9:30-10:00 am	Fred Jegerlehner	The LoopVerein: European activities
10:00-10:30 am	William Marciano	Moller Scattering and the Linear Collider
10:30-11:00 am	Coffee break, Orange Room	
11:00-12:00	Wolfgang Hollik	High precision at a Linear Collider - the need for radiative corrections
12:00-1:30 pm	Lunch in Berkner Cafeteria	
Plenary session Small Seminar Room, Physics Building Chair: Frank Paige		
1:30-2:00 pm	Graham Wilson	SM, WW, GigaZ (EXP)
2:00-2:30 pm	Stefan Dittmaier	Four-fermion production at future e^+e^- linear colliders
2:30-3:00 pm	Aurelio Juste	Higgs Studies at a LC (EXP)

3:00-3:30 pm	Laura Reina	Higgs Studies at a LC (TH)
3:30-4:00 pm	Coffee break, Orange Room	
Plenary session Small Seminar Room, Physics Building Chair: Jack Smith		
4:00-4:30 pm	Howard Baer	SUSY/Beyond the SM at a LC
4:30-5:00 pm	David Gerdes	QCD/top (EXP)
5:00-5:30 pm	Lynne Orr	QCD/top (TH)
5:30-6:00 pm	Stephen Mrenna	MCs
6:30-8:00 pm	Dinner in Berkner Cafeteria	

Friday, May 10, 2002		
8:30-9:00 am	Coffee in Orange Room, Physics Building	
Parallel session Rooms 2-78, 2-95, Small Seminar Room, Physics Building		
9:00-10:00 am	Parallel sessions	
10:00-10:30 am	Coffee break, Orange Room	
10:30-12:00 am	Parallel sessions	
12:00-1:30 pm	Lunch in Berkner Cafeteria	
Plenary session Hamilton Seminar Room, Chemistry Building Chair: Alberto Sirlin		
1:30-2:00 pm	Michael Kraemer	Summary, SM/Higgs
2:00-2:30 pm	William Kilgore	Summary,QCD/Top
2:30-3:00 pm	Tilman Plehn	Summary, SUSY/Beyond the SM
3:00 pm	Adjourn	

LoopFest

Brookhaven National Laboratory, Upton, NY

May 9-10, 2002

Parallel session program

Friday, May 10, 2002			
	SM/Higgs Room 2-95, Physics Department Chair: M.Kraemer	Top/QCD Room 2-78, Physics Department Chair: W.Kilgore	SUSY/Beyond the SM Small Seminar Room, Physics Building Chair: T.Plehn
9:00-9:25 am	D.Zeppenfeld: *Determination of Higgs couplings at the LHC*	Z.Bern: *Bhabba scattering at two-loop*	H.Logan: *Discriminating the SM from the MSSM Higgs*
9:25-9:35 am		M.Tejeda-Yeomans: *Fermion-Boson Scattering at Two-Loop*	
9:35-9:45 am	D.Rainwater: *QED corrections to H->ZZ->4f*		G.Hiller: *Constraints on SUSY from rare b-decays*
9:45-10:00 am		R.Willey: *Non-QCD contributions to QCD sum rules*	
10:00-10:30 am	Coffee break, Orange Room		
10:30-10:55 am	A.Sirlin: *Effective Scheme of Renormalization,*	C.Oleari: *Challenges in the calculation of NNLO*	B.Dobrescu: TBA

	Simple Formulae, and Physical Applications	*scattering processes*	
10:55-11:15 am	A.Signer: *Finite width effects for processes with unstable particles*	C.Anastasiou: *Cutting technique and gluon fusion to Higgs at NNLO*	G.Kribs: *Constraints on the SU(3) electroweak model*
11:15-11:35 am	A.Vicini: *Towards a full calculation of one-loop corrections to e^+e^-->4f (status and challenges)*	A.Czarnecki: *Top threshold*	J.Jiang: *Higgs Boson Decay into Hadronic Jets*
11:35-12:00 am	G.Passarino: *Recent developments on the numerical evaluation of multi-loop Feynman diagrams*	C.Macesanu: *NLO top-pair production at e^+e^- colliders*	S.Martin: *Two-loop effective potential for a general renormalizable theory and softly broken supersymmetry*
12:00-1:30 pm	Lunch in Berkner Cafeteria		