LOOPS AND LEGS IN QUANTUM FIELD THEORY

7th ZEUTHEN WORKSHOP ON ELEMENTARY PARTICLE THEORY

Schedule

Sunday, April 25:

4.00 p.m. **Registration**

7.30 p.m. *Reception*

Monday, April 26: Morning Session

7.30 a.m.	–	9.00 a.m.		**Breakfast**

pp Physics

9.00 a.m.	–	9.05 a.m.		Opening
9.05 a.m.	–	9.25 a.m.	**N. Glover**	NNLO corrections to Jet Physics
9.25 a.m.	–	9.35 a.m.		Discussion
9.35 a.m.	–	9.55 a.m.	**D. Zeppenfeld**	QCD corrections to weak boson fusion processes
9.55 a.m.	–	10.05 a.m.		Discussion
10.05 a.m.	–	10.25 a.m.	**W. van Neerven**	NNLO corrections to the polarized Drell-Yan coefficient function
10.25 a.m.	–	10.35 a.m.		Discussion
10.35 a.m.	–	10.55 a.m.	**J. Smith**	NNLO corrections to Higgs production at LHC
10.55 a.m.	–	11.05 a.m.		Discussion
11.05 a.m.	–	11.30 a.m.		**Coffee Break**
11.30 p.m.	–	11.50 p.m.	**R. Harlander**	Precise predictions for Higgs cross sections at the LHC
11.50 p.m.	–	12.00 p.m.		Discussion
12.00 p.m.	–	12.20 p.m.	**V. Ravindran**	Pseudoscalar and scalar Higgs Cross Section at LHC
12.20 p.m.	–	12.30 p.m.		Discussion
12.30 a.m.	–	12.50 p.m.	**M. Grazzini**	Soft gluon resummation for Higgs boson production at hadron colliders
12.50 p.m.	–	13.00 p.m.		Discussion
1.00 p.m.	–	2.00 p.m.		**Lunch Break**

Monday, April 26: Afternoon Session

pp Physics

2.00 p.m. – 2.20 p.m.	**J. Kodaira**	Soft gluon effects in the transversely polarized Drell-Yan process
2.20 p.m. – 2.30 p.m.		Discussion
2.30 p.m. – 2.50 p.m.	**M. Fontannaz**	Large-$p_\perp$ photons and hadrons in electro–production and photoproduction at NLO
2.50 p.m. – 3.00 p.m.		Discussion
3.00 p.m. – 3.20 p.m.	**S. Weinzierl**	Infrared finite cross sections at NNLO
3.20 p.m. – 3.30 p.m.		Discussion
3.30 p.m. – 3.50 p.m.	**A. De Freitas**	Two-loop helicity amplitudes for quark-quark scattering in QCD and gluino-gluino scattering in supersymmetric Yang-Mills theory
3.50 p.m. – 4.00 p.m.		Discussion
4.00 p.m. – 4.30 p.m.		**Coffee Break**
4.30 p.m. – 4.50 p.m.	**H. Kawamura**	B meson structure functions in the heavy quark limit
4.50 p.m. – 5.00 p.m.		Discussion
5.00 p.m. – 5.20 p.m.	**M. Cacciari**	Heavy flavor production at Tevatron
5.20 p.m. – 5.30 p.m.		Discussion
5.30 p.m. – 5.50 p.m.	**M. Krämer**	NLO QCD Corrections to $b\overline{b}$ Higgs production at hadron colliders
5.50 p.m. – 6.00 p.m.		Discussion
6.00 p.m. – 6.20 a.m.	**A. Vuorinen**	QCD pressure up to four loops at finite temperature and density
6.20 p.m. – 6.30 p.m.		Discussion
6.30 p.m. – 6.50 p.m.	**D. Jones**	Supersymmetric β-functions and semi-perturbative unification
6.50 p.m. – 7.00 p.m.		Discussion
7.00 p.m.		**Dinner**

Tuesday, April 27: Morning Session

e^+e^- Physics

7.30 a.m.	–	8.30 a.m.		**Breakfast**
8.30 a.m.	–	9.10 a.m.	**R. Klanner**	The high energy programme at DESY
9.10 a.m.	–	9.20 a.m.		Discussion
9.20 a.m.	–	9.40 a.m.	**J. Gluza**	Contributions to 2-loop QED Bhabha scattering
9.40 a.m.	–	9.50 a.m.		Discussion
9.50 a.m.	–	10.10 a.m.	**W. Hollik**	One-loop calculations for SUSY processes
10.10 a.m.	–	10.20 a.m.		Discussion
10.20 a.m.	–	10.40 a.m.	**P. Zerwas**	Supersymmetry parameter analyses at TeV- and Planck scales
10.40 a.m.	–	10.50 a.m.		Discussion
10.50 a.m.	–	11.20 a.m.		**Coffee Break**
11.20 a.m.	–	11.40 a.m.	**S. Heinemeyer**	Precision SUSY physics
11.40 a.m.	–	11.50 a.m.		Discussion
11.50 a.m.	–	12.10 p.m.	**M. Czakon**	The effective leptonic weak mixing angle to two–loop order in the electro–weak interactions
12.10 p.m.	–	12.20 p.m.		Discussion
12.20 p.m.	–	12.40 p.m.	**G. Passarino**	Multi-loop Feynman diagrams: numerical techniques
12.40 p.m.	–	12.50 p.m.		Discussion
12.50 p.m.	–	2.15 p.m.		**Lunch Break**

Tuesday, April 27: Afternoon Session

Collider Physics

2.15 p.m. – 2.35 p.m.	**E. Remiddi**	Differential equations for the equal mass 2-loop sunrise at arbitrary momentum transfer
2.35 p.m. – 2.45 p.m.		Discussion
2.45 p.m. – 3.05 p.m.	**M. Weber**	Radiative corrections to Higgs-boson production at e^+e^- colliders
3.05 p.m. – 3.15 p.m.		Discussion
3.15 a.m. – 3.35 p.m.	**Ch. Anastasiou**	NNLO differential distributions
3.35 p.m. – 3.45 p.m.		Discussion
3.45 p.m. – 4.15 p.m.		**Coffee Break**
4.15 p.m. – 4.35 p.m.	**V. Smirnov**	Evaluating multiloop Feynman integrals by Mellin-Barnes representation
4.35 p.m. – 4.45 p.m.		Discussion
4.45 p.m. – 5.05 p.m.	**G. Rodrigo**	Collinear limit of QCD amplitudes
5.05 p.m. – 5.15 p.m.		Discussion
5.15 p.m. – 5.35 p.m.	**P. Uwer**	NLO QCD corrections to $gg \to t\bar{t}g$
5.35 p.m. – 5.45 p.m.		Discussion
5.45 a.m. – 6.05 p.m.	**M. Steinhauser**	Three-loop matching of the dipole operators for $b \to s\gamma$ and $b \to sg$
6.05 p.m. – 6.15 p.m.		Discussion
6.15 p.m. – 7.10 p.m.		**Dinner**
7.15 p.m.		**Bus Departure to Wolgast**

8.00 p.m. *Organ Concert at St. Petri in Wolgast*

Wednesday, April 28: Morning Session

7.30 a.m.	–	8.30 a.m.		**Breakfast**

ep Physics

8.30 a.m.	–	8:50 a.m.	**J. Vermaseren**	Structure functions at 3 loops: results
8.50 a.m.	–	9.00 a.m.		Discussion
9.00 a.m.	–	9.20 a.m.	**S. Moch**	Structure functions at 3 loops: methods
9.20 a.m.	–	9.30 a.m.		Discussion
9.30 a.m.	–	9:50 a.m.	**Z. Bern**	Two-loop Splitting Amplitudes
9:50 a.m.	–	10.00 a.m.		Discussion
10.00 a.m.	–	10.20 a.m.	**H. Böttcher**	Non–singlet QCD analysis of structure functions at 3–loops
10.20 a.m.	–	10.30 a.m.		Discussion
10.30 a.m.	–	11.00 a.m.		**Coffee Break**
11.00 a.m.	–	11.20 a.m.	**G. Schierholz**	Lattice results on structure function moments
11.20 a.m.	–	11.30 a.m.		Discussion
11.30 a.m.	–	11.50 a.m.	**P. Kroll**	Generalized parton distributions and wide-angle exclusive scattering
11.50 a.m.	–	12.00 a.m.		Discussion
12.00 a.m.	–	12.20 p.m.	**T. Uematsu**	Mass effects in the virtual photon structure
12.20 p.m.	–	12.30 p.m.		Discussion
12.30 p.m.	–	12.50 p.m.	**S. Dittmaier**	Electroweak radiative corrections to deep–inelastic neutrino scattering
12.50 p.m.	–	1.00 p.m.		Discussion
1.00 p.m.	–	2.30 p.m.		**Lunch Break**

2.30 p.m. *Excursion to the Museum at Peenemünde or Boat Tour*

6.30 p.m. **Dinner**

8.00 p.m. **D.J. Gross** *The Discovery of Asymptotic Freedom and the Emergence of QCD*

Thursday, April 29: Morning Session

7.30 a.m.	–	8.30 a.m.		**Breakfast**

pp Physics

8.30 a.m.	–	9.10 a.m.	**J. Engelen**	Physics at LHC
9.10 a.m.	–	9.20 a.m.		Discussion

Mathematical Methods

9.20 a.m.	–	9.40 a.m.	**M. Hoffman**	Hopf algebras and multiple harmonic sums
9.40 a.m.	–	9.50 a.m.		Discussion
9.50 a.m.	–	10.10 a.m.	**Hoang Ngoc Minh**	Shuffle algebra and monodromy of multiple polylogarithms
10.10 a.m.	–	10.20 a.m.		Discussion
10.20 a.m.	–	10.40 p.m.	**J. Blümlein**	Mathematical structure of QCD single scale quantities in higher orders
10.40 p.m.	–	10.50 p.m.		Discussion
10.50 p.m.	–	11.20 p.m.		**Coffee Break**
11.20 a.m.	–	11.40 a.m.	**V. Gerdt**	Gröbner bases in perturbative calculations
11.40 a.m.	–	11.50 a.m.		Discussion
11.50 p.m.	–	12.10 p.m.	**D. Kreimer**	The Lie- and Hopf algebras of quantum fields: from numbers and polylogarithms to Dyson-Schwinger equations
12.10 p.m.	–	12.20 p.m.		Discussion
12.20 p.m.	–	12.40 p.m.	**K. Chetyrkin**	Five loop vacuum polarization in perturbative QCD
12.40 p.m.	–	12.50 p.m.		Discussion
12.50 p.m.	–	2.30 p.m.		**Lunch Break**

Thursday, April 29: Afternoon Session I

General Aspects

2.30 p.m. – 2.50 p.m.	**T. Binoth**	Multiparticle amplitudes at one-loop: a numeric approach
2.50 p.m. – 3.00 p.m.		Discussion
3.00 p.m. – 3.20 p.m.	**W. Giele**	A Calculational formalism for massless one-loop integrals
3.20 p.m. – 3.30 p.m.		Discussion
3.30 p.m. – 3.50 p.m.	**M. Kalmykov**	Series, ϵ-expansion of the hypergeometric functions and Feynman diagrams
3.50 p.m. – 4.00 p.m.		Discussion
4.00 p.m. – 4.30 p.m.		**Coffee Break**
4.30 p.m. – 4.50 p.m.	**J. Körner**	Expansion of massive scalar one-loop integrals to $\mathcal{O}(\epsilon^2)$
4.50 p.m. – 5.00 p.m.		Discussion
5.00 p.m. – 5.20 p.m.	**A. Penin**	Two-loop logarithms in electro–weak processes at High Energy
5.20 p.m. – 5.30 p.m.		Discussion
5.30 p.m. – 5.50 p.m.	**L. Mihaila**	Charmonium production at NLO in NRQCD
5.50 p.m. – 6.00 p.m.		Discussion
6.00 p.m. – 6.20 p.m.	**G. Heinrich**	A numerical approach to infrared divergent multi–parton phase space integrals
6.20 p.m. – 6.30 p.m.		Discussion

7.30 p.m. *Banquet*

Thursday, April 29: Afternoon Session II

Low Energy Processes

2.30 p.m.	–	2.50 p.m.	**M. Faisst**	Multi-loop tadpoles
2.50 p.m.	–	3.00 p.m.		Discussion
3.00 p.m.	–	3.20 p.m.	**D. Stöckinger**	Two loop SUSY corrections to the anomalous magnetic moment of the muon
3.20 p.m.	–	3.30 p.m.		Discussion
3.30 p.m.	–	3.50 p.m.	**K. Kolodziej**	Towards precise predictions for the Higgsstrahlung at a linear collider
3.50 p.m.	–	4.00 p.m.		Discussion
4.00 p.m.	–	4.30 p.m.		**Coffee Break**

Automatization

4.30 p.m.	–	4.50 p.m.	**J. Fujimoto**	Multi–leg calculations with GRACE/LOOP system
4.50 p.m.	–	5.00 p.m.		Discussion
5.00 p.m.	–	5.20 p.m.	**A. Lorca**	Massive fermion production with DIANA/aITALC
5.20 p.m.	–	5.30 p.m.		Discussion
5.30 p.m.	–	5.50 p.m.	**T. Hahn**	New features in FormCalc and their application to $2 \to 3$ processes
5.50 p.m.	–	6.00 p.m.		Discussion
6.00 p.m.	–	6.20 p.m.	**S. Jadach**	MC solution of QCD evolution equations
6.20 p.m.	–	6.30 p.m.		Discussion

7.30 p.m. *Banquet*

Friday, April 30: Morning Session

7.30 a.m.	–	8.30 a.m.		**Breakfast**

Coupling Constants

8.30 a.m.	–	9.10 a.m.	**S. Bethke**	World review on α_s
9.10 a.m.	–	9.20 a.m.		Discussion
9.20 a.m.	–	9.40 a.m.	**H. Fritzsch**	Does the QCD scale depend on time?
9.40 a.m.	–	9.50 a.m.		Discussion
9.50 a.m.	–	10.10 a.m.	**W. Kluge**	The DAFNE physics programme
10.10 a.m.	–	10.20 a.m.		Discussion
10.20 p.m.	–	10.50 p.m.		**Coffee Break**

General Aspects

10.50 a.m.	–	11.10 a.m.	**F. Del Aguila**	Localized quantum corrections
11.10 a.m.	–	11.20 a.m.		Discussion
11.20 a.m.	–	11.40 a.m.	**G. Altarelli**	An improved splitting function for small-x evolution
11.40 a.m.	–	11.50 a.m.		Discussion
11.50 a.m.	–	12.20 a.m.	**D. Broadhurst**	What propels perturbative quantum field theory?
12.20 p.m.				**Lunch**
13.20 p.m.				**Departure**