lecturer:

Name: Prof. Dr. W.L.G.A.M. van Neerven
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Tutorial assistents:

1. Quantum Field Theory

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Building: Oortgebouw, office number 240

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lectures:

1. **Quantum Field Theory**

Date lectures: Monday, 24-1-2004 t/m 9-5-2004, except for 28th March and 2th May,
13.45-15.30,
Thursday, 27-1-2004 t/m 21-4-2004 even weeks only,
13.45-15.30.

lecture room: HL204

Date tutorials: to be determined

Date written exam: has to be fixed after consultation with the students.

Because of a mistake in the lecture guide the content of the lectures will be presented below:

Content:

Classical fields with the corresonding equations: Klein-Gordon field, Dirac-field, elektromagnetic field. Euler-Lagrange equation. Noether-theorem. Simple interactions described in the interaction picture. Path integral for the scalar field, spontaneous symmetry breaking and the Landau-Hamiltonian. Applications to high energy physics (collision and decay processes), statistical physics (critical phenomena) and condensed matter (low temperature superconductivity).

lecture material:

1. **Quantum Field Theory**

a) **lecture notes**:

can be found on the WEB-site: http://www.lorentz.leidenuniv.nl/ neerven

b) **books**:

literature recommended:

D. Griffiths,"Introduction to Elementary Particles", John Wiley & Sons Inc., ISBN 86-25709.
R.J. Rivers,"Path integral methods in quantum field theory", Cambridge Univ. Press, ISBN 0 521 36870 7.
L.H. Ryder,"Quantum Field Theory" Cambridge Univ. Press, ISBN 0 521 33859 X.

special subjects: see WEB-site: http://www.lorentz.leidenuniv.nl/ neerven

Exercises (+if possible the answers)

1. **Quantum Field Theory**

exercises can be found on the WEB-site: http://www.lorentz.leidenuniv.nl/ neerven

home work problems:

1. **Quantum Field Theory**

home work problems: none

old exams:

1. **Quantum Field Theory**

Solutions of old exams: none

Eventual: back ground information

a) Lecture notes on Quantum Theory 2 which can be found on the WEB-site: http://www.lorentz.leidenuniv.nl/ neerven

b) Books:

R.J. Rivers, "Path Integral Methods in Quantum Field Theory", Cambridge Univ. Press, ISBN 0 521 36870 7.
D.J. Amit, "Field Theory, The Renormalization Group and Critical Phenomena", World Scientific, ISBN 9971-966-11-5.
M. Le Bellac, "Quantum and Statistical Field Theory", Clarendon Press Oxford, ISBN 0-19-853964-9.

links relevant for the lectures:

WEB-site: http://www.lorentz.leidenuniv.nl/ neerven