

Advanced Topics in Theoretical Physics II 2017 (NS-TP530M)

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Lectures are on Mondays, 11:00-12:45 and 13:15-14:00 in BBG 7.12

Lecture attendance: required (min 70%)

Exercise classes are on Mondays 14:15-17:00 in BBG 7.12

Attendance: required (min 70%)

Program:

- * The density operator and entropy
 - * Propagators and two-point functions
 - * The Schwinger-Keldysh or the in-in formalism
 - * Perturbation theory
 - * Applications
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Literature:

Required:

1. Lecture notes by Dražen Glavan and Tomislav Prokopec, available at:
<http://www.staff.science.uu.nl/~proko101/>

Recommended:

2. Jürgen Berges, “Introduction to nonequilibrium quantum field theory,” AIP Conf. Proc. **739** (2005) 3 doi:10.1063/1.1843591 [hep-ph/0409233].
3. N. D. Birrell, P. C. W. Davies, ”Quantum Fields in Curved Space,” (Cambridge Monographs on Mathematical Physics, Cambridge University Press, 1984) ISBN-13: 978-0521278584, ISBN-10: 0521278589
4. R. D. Jordan, “Effective Field Equations for Expectation Values,” Phys. Rev. D **33** (1986) 444.
5. Esteban A. Calzetta and Bei-Lok B. Hu, ”Nonequilibrium Quantum Field Theory,” (Cambridge Monographs on Mathematical Physics, 2008), ISBN-13: 978-0521641685, ISBN-10: 0521641683

Course evaluation:

Homeworks (weekly): $4 \times 15\% = 60\%$, available at <http://www.staff.science.uu.nl/~proko101/>

Exam: On Oct 9, 2017 (at 11:00-12:30 in BBG 7.12) written exam; followed by an *oral exam*. The written exam counts for 20% and the oral for 20% of the grade. To be admitted to the exam, you have to collect at least 30 points (i.e. 50%) from the hand-in exercises.

Passing grade: 55%

Retake exam will be scheduled individually if needed.