

MAP50004: Advanced Quantum Field Theory

Semester taught	Hillary Term
Module Coordinator	Jan Manschot
Credits	5 ECTS
Content	The module begins with the BRST quantization of Yang-Mills theory, followed by the evaluation of the beta function using the background field method and asymptotic freedom. The module will continue with perturbative anomalies, and the strong/weak coupling behavior of Wilson loops. Time permitting, the module will discuss monopoles and instantons in Yang-Mills theories, and exact results on these subjects in supersymmetric theories.
Learning Outcomes	<ul style="list-style-type: none">• Qualitative and computational understanding of Yang-Mills theories• Analyse simple models for physical properties.• Evaluation of one-loop Feynman diagrams and their role for the beta function and perturbative anomalies.• Analysis of strong coupling dynamics using Wilson loops and other observables.
Assessment detail	50% continuously assessment and 50% online examination