MAP50003: Modern Quantum Field Theory

| Semester taught | Michaelmas Term |
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| Module Coordinator | Manya Sahni |
| Credits | 5 ECTS |
| Content | Path integral methods for scalar, vector and spinor fields. Systematics of Renormalization: Wilsonian approach, Callan- Symanzik equation, anomalous dimensions. Non-Abelian Gauge theory: Yang-Mills Lagrangian, including gauge fixing and Faddeev-Popov ghosts. Perturbative Feynman calculations including computation of the one-loop beta-function and asymptotic freedom. |
| Learning Outcomes | Derive Feynman rules from path integrals. Carry out the one-loop renormalization of QED and similar theories. Compute simple tree-level gluon amplitudes. Compute the QCD one-loop beta-function. |
| Assessment detail | 50% continuously assessment and 50% online examination |