

Week 1: Path Integrals & Introduction I

Tuesday 11 November

14:00–15:30, Minnaertgebouw 0.03

Lecture by *Stefan Vandoren* on the path integral formulation of QFT.

Friday 14 November

13:15–14:45, Minnaertgebouw 0.03

Discussion class on introductory readings.

Readings:

Historical Introduction, Ch.1 of (Weinberg, 1995)

The History of QFT, Supp. doc. in sec. 1 of (Kuhlmann, 2020)

Assignment:

No motivated question this week!

Week 2: Introduction II

Tuesday 18 November

13:00–17:00, Minnaertgebouw 0.03

Lecture by *Sanne Vergouwen* on a general introduction to the philosophy of QFT, followed by a discussion on the lecture and reading.

Friday 21 November

13:15–14:45, Minnaertgebouw 3.12

Discussion class about motivated questions.

Readings:

The Casimir Effect, Ch.15 of (Schwartz, 2013)

Philosopher's Guide to the Foundations of Quantum Field Theory, (Swanson, 2017)

Assignment:

Thursday 20 November, 23:59, submit motivated questions to Noemi.

Week 3: Ontology

Tuesday 25 November

13:00–17:00, Minnaertgebouw 0.03

Lecture by Luca Gasparinetti and Aaron Collavini on QFT ontologies, followed by a discussion on the lecture and reading.

Friday 28 November

13:15–14:45, Caroline Bleekergebouw 1.08

Discussion class about motivated questions, opportunity for students to lead the session.

Readings:

Ontologies for Quantum Field Theory, (Gasparinetti & Collavini, forthcoming)

Three Field Ontologies for QFT, (Swanson, 2024)

Assignment:

Thursday 27 November, 23:59, submit motivated questions to Noemi.

Week 4: Renormalisation

Tuesday 02 December

13:00–17:00, Room: Minnaertgebouw 0.03

Lecture by Gerard 't Hooft on renormalisation, followed by a discussion on the lecture and reading.

Friday 05 December

13:15–14:45, Caroline Bleekergebouw 1.08

Discussion class about motivated questions, opportunity for students to lead the session.

Readings:

Renormalization Group Methods, (Williams, 2021)

Renormalization for Philosophers, (Butterfield & Bouatta, 2014)

Optional:

The Development of Renormalization Group Methods for Particle Physics, (Fraser, 2020)

Assignment:

Thursday 04 December, 23:59, submit motivated questions to Noemi.

Week 5: Locality

Tuesday 09 December

13:00–17:00, Minnaertgebouw 0.03

Lecture by *F.A. Muller* on locality in quantum field theory, followed by a discussion on the lecture and reading.

Friday 12 December

13:15–14:45, Minnaertgebouw 0.03

Discussion class about motivated questions, opportunity for students to lead the session.

Readings:

Non-Locality in Relativistic Quantum Physics, (Muller & Berkovitz, 2022)

Optional:

No Place for Particles in Relativistic Quantum Theories?, (Halvorson & Clifton, 2002)

Reeh–Schlieder Defeats Newton–Wigner: On Alternative Localization Schemes in Relativistic Quantum Field Theory, (Halvorson, 2001)

Assignment:

Thursday 11 December, 23:59, submit motivated questions to Noemi.

Week 6: Axiomatic QFT

Tuesday 16 December

13:00–17:00, Minnaertgebouw 0.03

Lecture by *Guido Bacciagaluppi* on the Haag-Kastler axioms and the axiomatic QFT program, followed by a discussion on the lecture and reading.

Winter break

Friday 09 January

13:15–14:45, Minnaertgebouw 0.03

Discussion class about motivated questions.

Readings:

An Algebraic Approach to Quantum Field Theory, (Haag & Kastler, 1964)

Algebraic Quantum Field Theory — an Introduction, (Fewster & Rejzner, 2019)

Assignment:

Thursday 08 January, 23:59, submit motivated questions to Noemi.

Week 7: Effective Field Theories

Tuesday 13 January

13:00–17:00, Minnaertgebouw 0.03

Lecture by *Sebastian de Haro* on the effective field theory paradigm in QFT, followed by a discussion on the lecture and reading.

Friday 16 January

13:15–14:45, Minnaertgebouw 0.03

Discussion class about motivated questions, opportunity for students to lead the session.

Readings:

Philosophical Foundations of Effective Field Theories, (Rivat & Grinbaum, 2019)

Scientific Realism Made Effective, (Williams, 2019)

Optional:

Effective Field Theories, (Bain, 2013)

Effective Field Theories, Reductionism and Scientific Explanation, (Hartmann, 2001)

Assignment:

Thursday 15 January, 23:59, submit motivated questions to Noemi.

Week 8: History of QFT

Tuesday 20 January

13:00–17:00, Minnaertgebouw 0.03

Lecture by *Stefano Furlan* on the historic background to QFT, followed by a discussion on the lecture and reading.

Friday 23 January

13:15–14:45, Minnaertgebouw 0.03

Discussion class about motivated questions, opportunity for students to lead the session.

Readings:

OED and the Men Who Made It, Introduction (xxi-xxviii) and Ch. 4 of (Schweber, 1994)

The State is Not Abolished, It Withers Away, (Blum, 2017)

Assignment:

Thursday 22 January, 23:59, submit motivated questions to Noemi.

Week 9: QFT and Gravity

Tuesday 27 January

13:00–17:00, Minnaertgebouw 0.03

Lecture by *Antonio Ferreiro de Aguiar* on QFT and gravity, followed by a discussion on the lecture and reading.

Friday 30 January

13:15–14:45, Minnaertgebouw 0.03

Closing session of the tutorial.

Readings:

Quantum Gravity in 30 Questions, (Loll et al., 2022)

Quantum Gravity at Low Energies, (Wallace, 2021)

Optional:

Strict renormalizability as a paradigm for fundamental physics, (Buoninfante, 2025)

Assignment:

No motivated question this week!