

Foundational Problems of Quantum Theory

Felix Finster, Klaus Richter, Johannes Kleiner

WS 13/14

Wed., 16:00-17:30; Room: M 102

General Literature: [Fil08],[Bel04]

1. Einstein-Podolsky-Rosen paradox and hidden variables

16.10.2013

Maximilian Emmerich, Maximilian.Emmerich@physik.uni-regensburg.de

Literature: [EPR35], [Bel81b, Sec. 1 and 2], [BA57, Sec. 1 and 2]

2. Bell- / Clauser-Horne-Shimony-Holt inequalities

23.10.2013

Markus Ludwig, Markus.Ludwig@stud.uni-regensburg.de

Johannes Holler, Johannes.Holler@stud.uni-regensburg.de

Literature: [CHSH69],[Bel81b],[AGR81]

3. No-signaling theorems (and compatibility of QT with SRT)

30.10.2013

Christiane Sommer, Christiane.Sommer@stud.uni-regensburg.de

Literature: [Ken95],[PH99]

4. The measurement problem (in conventional QT)

6.11.2013

Thomas Schmid, Thomas3.Schmid@stud.uni-regensburg.de

Lukas Brugggraf, lukas.burggraf@stud.uni-regensburg.de

Literature: [Bel89],[Fil08, Ch. 10],[vN96, Secs. 6.1 and 6.3])

5. Decoherence (and the Everett interpretation (“Many minds”))

13.11.2013

Tobias Krebs, tobias.krs@gmail.com

Literature: [Sch04, (in parts)],[JZK⁺10, Ch.2 (in parts)]

6. De Broglie–Bohm theory

20.11.2013

Lukas Elflein, lukaselflein@gmail.com

Dominik Vilsmeier, Dominik.Vilsmeier@stud.uni-regensburg.de

Literature: [Bel81a], [DGZ12], [Gol13], [Fil08, Sec. 9.5] (optional: [Bel82], [DGTZ08])

7. Ghirardi–Rimini–Weber theory (and similar theories)

27.11.2013

Markus Biberger, Markus.Biberger@physik.uni-regensburg.de

Literature: [Bel87], [AGTZ08] (optional: [JZK⁺10, Ch.8 (in parts)], [Ghi11])

8. Overview over other interpretations and modifications of QT (without many details)

04.12.2013

Michael Müller, Michael.Mueller@stud.uni-regensburg.de

Literature: [Boh63], [Hei55], Internet resources, ([Fil08])

9. Contextuality and Kochen-Specker theorem

11.12.2013

Stefan Lochner, Stephan.Lochner@stud.uni-regensburg.de

Markus Ehberger, markusehberger@gmx.net

Literature: [Per08, Ch.7],[CEA97])

10. Gleason's theorem

18.12.2013

Thomas Lottner, thommy.lottner@gmx.de

Manuel Bridger, manuel.bridger@gmx.de

Literature: [Gle57], [Per08, Sec. 7.2]

11. Pusey-Barrett-Rudolph theorem

08.01.2014

Richard Schmidt, Richard.Schmidt@stud.uni-regensburg.de

Literature: [PBR12], [Aar12]

12. Thought experiments in QT (and implications for foundational issues)

15.01.2014

Felix Bolland, Felix.Bolland@stud.uni-regensburg.de

Literature: [Fil08, Sec. 5.7, Ch. 7], Internet Resources

13. Weak measurements

22.01.2014

Julian Heger, jeliiahheger@googlemail.com

Literature: [AAV88]

14. The Aharonov–Bohm effect

29.01.2014

Sven Seeberg-Elverfeldt, Sven.Seeberg-Elverfeldt@stud.uni-regensburg.de

Literature: [AB59, AB61]

15. Causal Fermion Systems

05.02.2014

Prof. Felix Finster

Literature: [Fin11, FGS12]

In case of questions, please contact Johannes.Kleiner@mathematik.uni-regensburg.de.

Feel free to suggest additional/alternative topics!

Bibliography

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