

Tutorial on branching theories

Thomas Müller

RMA/HPS tutorial

Time: Monday, 9:00–13:00
Place: Drift 23, Tutorzaal 0.13
Meetings: 23 April; 7, 21 May; 11, 25 June
Paper outline due: 25 June
Paper due: 15 August
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This tutorial will give an introduction to theories that use the notion of a branching tree of open future possibilities. We will mostly be reading original research articles; some course materials will be provided as well. We will spend a session each working through three formal theories: branching time, the *stit* (“seeing to it that”) logic of agency, and branching space-times. One session will be devoted to the metaphysical discussion of whether branching gives an appropriate picture of an open future (this is contested); one session will focus on applications of branching theories in the philosophy of physics.

The course is offered as a tutorial at the MA level. Conditional on regular active attendance, a brief presentation and successful completion of a final paper, the tutorial can be used for course credit (7,5 ECTS) in the Research Master Philosophy and the History and Philosophy of Science MA program. Students from the Cognitive AI MA program are also welcome; separate arrangements will have to be made for such students if they want to take the tutorial for credit.

There was an introductory meeting on 26 March (13-16h). Due to overlap with another course, we moved to the slot 9-13h. There will be five working sessions in periode 4 (April–June). Some knowledge of logic is presupposed, and we will work through some real proofs, but the tutorial will focus on conceptual rather than technical questions and arguments. The amount of technical detail covered, and the degree of interaction with physics, will depend on the people present. The reading list below is a first suggestion; we can expand or modify this list at the introductory meeting. Suggestions are welcome.

Please send an email if you wish to attend. An updated reading list will be available shortly.

Schedule

26 March: First meeting: Introduction, overview of literature to be covered; distribution of topics for short presentations. Reading: Müller (2012).

23 April: Branching time. Reading: focus is on Thomason (1970); additionally, Belnap et al. (2001, Chap. 8). General background on modal logic: Blackburn et al. (2001).

7 May: On the tenability of branching; arguments for divergence. Reading: Lewis (1986, Chap. 4.2) and Belnap et al. (2001, 205ff.).

21 May: The *Thin red line*. Reading: Belnap et al. (2001, Chap. 6D, 6E) and Malpass and Wawer (2012).

11 June: Branching space-times. Reading: Belnap (1992, 2012); Müller et al. (2008).

15/16 June: There will be an international workshop on Nuel Belnap's work on indeterminism and free agency, open to participants of the seminar. Details to follow. (Attendance is strictly optional.)

25 June: Branching and physics. Suggestion: A paper on the Everett interpretation of quantum mechanics, Wilson (2011).

Paper outline due (paper copy at the session, and electronically via email; see above).

15 August: Final paper due (via email; see above).

References

Belnap, N. (1992). Branching space-time. *Synthese*, 92(3):385–434. Read the postprint at <http://philsci-archive.pitt.edu/1003/>.

Belnap, N. (2012). Newtonian determinism to branching space-times indeterminism in two moves. *Synthese*. Published online first, DOI: 10.1007/s11229-012-0063-5.

Belnap, N., Perloff, M., and Xu, M. (2001). *Facing The Future: Agents And Choices In Our Indeterminist World*. Oxford University Press, Oxford.

Blackburn, P., De Rijke, M., and Venema, Y. (2001). *Modal logic*. Cambridge: Cambridge University Press.

Lewis, D. K. (1986). *On the plurality of worlds*. Oxford: Blackwell.

Malpass, A. and Wawer, J. (2012). A future for the thin red line. *Synthese*. Published online first, DOI: 10.1007/s11229-012-0064-4.

Müller, T. (2012). Branching in the landscape of possibilities. *Synthese*. Published online first, DOI: 10.1007/s11229-011-0059-6.

Müller, T., Belnap, N., and Kishida, K. (2008). Funny business in branching space-times: infinite modal correlations. *Synthese*, 164:141–159.

Thomason, R. H. (1970). Indeterminist time and truth-value gaps. *Theoria*, 36:264–281.

Wilson, A. (2011). Everettian quantum mechanics without branching time. *Synthese*. Published online first, DOI: 10.1007/s11229-011-0048-9.