Final Report on Research Project "Probability, Causality, Space, and Time" (Valószínűség, kauzalitás, tér és idő), No. K100715 (2012-2016)

The research program have been pursued in all particular fields we described in the original Research Plan of the project. One of the main achievements in the first two years was that our monograph came out with Cambridge University Press.

Since 2014 two further research topics have been included, which are closely related to the original research program. Márton Gömöri and László E. Szabó, in collaboration with Zalán Gyenis (Department of Logic, Institute of Philosophy, Eötvös University), began to deal with a new problem: how can the fundamental ideas and premises of quantum theory be reconstructed in completely operational terms. We achieved important partial results, but, as it turned out, the project raises non-trivial mathematical problems, and requires further research.

Another slight modification in the focuses of research was that Miklós Rédei, in collaboration with Zalán Gyenis, and partly with Gábor Hofer-Szabó, turned to a couple of fundamental problems hotly discussed in the philosophy of probability literature, such as the Beltrand's Paradox, Davis Lewis' Principal Principle, the Borel-Kolmogorov Paradox, and the Bayesian inference.

Year 2016 was an extension of the original research project ending with 2015 January 31, financially based on the 900.000 HUF balance from the original period. During the extension period we had 4 papers, 22 conference talks, and 13 seminar talks.

In sum, during the whole period from 2012 January 1 to 2016 December 31, we published 1 monograph and 32 papers (30 in international journals and volumes); we delivered 73 conference talks and 68 seminar talks.

Book

1. G. Hofer-Szabó, M. Rédei, L.E. Szabó: *The Principle of the Common Cause*, Cambridge: Cambridge University Press, 2013.

Papers

1. Z. Gyenis, M. Rédei: "General properties of Bayesian learning as statistical inference determined by conditional expectations" The Review of Symbolic Logic (accepted for publication, preprint: Philsci-Archive)

2. Z. Gyenis, G. Hofer-Szabó, M. Rédei: "Conditioning using conditional expectations: The Borel-Kolmogorov Paradox" Synthese (forthcoming, First Online: 26 March 2016, DOI: 10.1007/s11229-016-1070-8 online, open access)

3. Z. Gyenis, M. Rédei: "Measure theoretic analysis of consistency of the Principal Principle" Philosophy of Science 83 (2016) 972-987.

4. G. Hofer-Szabó, P. Vecsernyés: A generalized definition of Bell's local causality, *Synthese*, 193 (2016), 3195-3207.

5. Y. Kitajima, M. Rédei: "Characterizing common cause closedness of quantum probability theories" *Studies in History and Philosophy of Modern Physics* 52 (2015) 234-241

6. Z. Gyenis, M. Rédei: Defusing Bertrand's Paradox, *The British Journal for the Philosophy of Science* 66 (2015) 349-373

7. Z. Gyenis, M. Rédei: Why Bertrand's Paradox is not paradoxical but is felt so, in *Recent Developments in the Philosophy of Science: EPSA13 Helsinki*, U. Maki, S. Ruphy, G. Schurz, I. Votsis, (eds.) (Springer, 2015) 265-276

8. G. Hofer-Szabó: Local causality and complete specification: a reply to Seevinck and Uffink, in *Recent Developments in the Philosophy of Science: EPSA13 Helsinki*, U. Maki, S. Ruphy, G. Schurz, I. Votsis, (eds.) (Springer, 2015), 209-226.

9. G. Hofer-Szabó: Relating Bell's local causality to the Causal Markov Condition, *Foundations of Physics* 45 (2015) (9), 1110-1136.

10. G. Hofer-Szabó: On the relation between the probabilistic characterization of the common cause and Bell's notion of local causality, *Studies in the History and Philosophy of Modern Physics* 49 (2015), 32-41.

11. G. Hofer-Szabó and P. Vecsernyés, On the concept of Bell's local causality in local classical and quantum theory, *Journal of Mathematical Physics* 56 (2015), 032303.

12. M. Gömöri and L. E. Szabó: Formal statement of the special principle of relativity, *Synthese*, 192 (2015), pp. 2053–2076.

13. Gábor Hofer-Szabó: Noncommutative causality in algebraic quantum field theory, M. C. Galavotti, D. Dieks, W. J. Gonzalez, S. Hartmann, Th. Uebel, M. Weber (eds.), *The Philosophy of Science in a European Perspective, Vol. 5.*, 543-554, 2014.

14. Gábor Hofer-Szabó: EPR correlations, Bell inequalities and common cause systems, D. Aerts, S. Aerts and C. de Ronde (eds.), *Probing the Meaning of Quantum Mechanics: Physical, Philosophical and Logical Perspectives*, 263-277., 2014.

15. M. Rédei: Hilbert's 6th Problem and Axiomatic Quantum Field Theory, *Perspectives on Science* 22 (2014) 80–97.

16. Miklós Rédei: A categorial approach to relativistic locality, Studies in the History and Philosophy of Modern Physics 48 (2014) 137-146.

17. Miklós Rédei: Assessing the status of the Common Cause Principle, in *New Directions in the Philosophy of Science*, M-C. Galavotti, D. Dieks, W.J. Gonzalez, S. Hartmann, T. Uebel, M. Weber, (eds.) (Springer, 2014) 433-442.

18. Zalán Gyenis and Miklós Rédei: Atomicity and causal completeness, *Erkenntnis* 79 (2014) 437–445.

19. Zalán Gyenis and Miklós Rédei: Defusing Bertrand's Paradox, The British Journal for the Philosophy of Science, doi: 10.1093/bjps/axt036, 2014.

20. G. Hofer-Szabó, P. Vecsernyés: Bell inequality and common causal explanation in algebraic quantum field theory, Studies in the History and Philosophy of Modern Physics, 44 (2013), 404-416.

21. E. Szabó László: Vázlatpontok a fizikai elméletek fizikalista értelmezéséhez, In Zvolenszky Zs. et al. (szerk.), *Nehogy érvgyűlölők legyünk – Tanulmánykötet Máté András 60. születésnapjára*, L'Harmattan, Bp. 2013, p. 122–129.

22. G. Hofer-Szabó, P. Vecsernyés: Bell inequality and common causal explanation in algebraic quantum field theory, *Studies in the History and Philosophy of Modern Physics* 44 (2013), 404-416.

23. G. Hofer-Szabó, P. Vecsernyés: Noncommutative Common Cause Principles in algebraic quantum field theory, *Journal of Mathematical Physics* 54 (2013), 042301.

24. Gömöri Márton: Szuperholizmus, In Zvolenszky Zs. et al. (szerk.), *Nehogy érvgyűlölők legyünk – Tanulmánykötet Máté András 60. születésnapjára*, L'Harmattan, Budapest, 2013, 55–69.

25. M. Gömöri, L. E. Szabó: Operational understanding of the covariance of classical electrodynamics, *Physics Essays* 26 (2013), 361–370. DOI: 10.4006/0836-1398-26.3.361.

26. Szabó Gábor: Vis aleativa - a valószínűség propensity-interpretációja, *Magyar Filozófiai Szemle*, 2012/1, 56, 95-117.

27. M. Rédei, I. Pedro San: Comparing causality principles, *Studies in the History and Philosophy of Modern Physics* 43 (2012) 84-89.

28. M. Rédei, C. Werndl: On the history of the isomorphism problem of dynamical systems with special regard to von Neumann's contribution, *Archive for History of Exact Sciences* 66 (2012) 71-93.

29. M. Rédei: Some historical and philosophical aspects of quantum probability theory and its interpretation, In *Probabilities, Laws and Structures*, D. Dieks, Wenceslao J. Gonsalez, S. Hartmann, M. Stöltzner, M. Weber (eds.) (Springer, 2012) 497-506.

30. L. E. Szabó: Mathematical facts in a physicalist ontology, *Parallel Processing Letters*, 22 (2012) 1240009.

31. Hofer-Szabó G., P. Vecsernyés: Reichenbach's common cause principle in algebraic quantum field theory with locally finite degrees of freedom, *Foundations of Physics*, 42 (2012), 241-255.

32. Hofer-Szabó G., P. Vecsernyés: Noncommutative local common causes for correlations violating the Clauser-Horne inequality, *Journal of Mathematical Physics*, 53 (2012) 122301.

33. Gábor Hofer-Szabó: Separate common causal explanation and the Bell inequalities, *International Journal of Theoretical Physics* 51 (2012), 110-123.

Conference presentations

1. G. Hofer-Szabó: Kauzalitás és dinamika (Causality and dynamics), Az okság mint az „univerzum cementje", MTA, Budapest, 2016 November.

2. G. Hofer-Szabó: On the Budapest Research Group, Science Studies in Budapest, CEU, Budapest, 2016 October.

3. G. Hofer-Szabó: Mik a kvantumállapotok? (What are quantum states?), Physics meets philosophy, Institute of Philosophy, Hungarian Academy of Sciences, 2016 September.

4. G. Hofer-Szabó: Deconstructing superposition, The Sixth Budapest-Krakow Workshop on Probability, Causality and Determinism, Krakow, Poland, 2016 September.

5. G. Hofer-Szabó: Einstein's reality criterion, XII Conference of the Italian Society for Analytic Philosophy, Pistoia, Italy, 2016 September.

6. G. Hofer-Szabó: On the meaning of EPR's Criterion of Reality, Eighth Quadrennial Pittsburgh Fellows Conference, Lund, Sweden, 2016 July.

7. G. Hofer-Szabó: Quantum mechanics as a representation of classical conditional probabilities, Quantum Foundations Workshop, Pavia, Italy, 2016 June.

8. G. Hofer-Szabó: Quantum mechanics from scratch, The Fifth Budapest-Krakow Workshop on Probability, Causality and Determinism, Budapest, Hungary, 2016 May.

9. G. Hofer-Szabó: Bell's local causality and d-separation, Local Causality and Causal Graphs, Mini-symposium of the Philosophy of Physics Research Group, Institute of Philosophy, Hungarian Academy of Sciences, 2016 March.

10. M. Gömöri: "Chance in a Physical World", Fifth Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism, Budapest, Hungary, 2016 May.

11. M. Gömöri, G. Hofer-Szabó: "On the Meaning of EPR's Criterion of Reality", British Society for the Philosophy of Science Annual Conference, Cardiff, UK, 2016 July.

12. M. Gömöri, L. E. Szabó: "For the 40th Birthday of Bell's Spaceships", The 18th UK and European Conference on Foundations of Physics, London, UK, 2016 July.

13. M. Rédei: "General properties of Bayesian learning based on conditional expectation as a conditioning device", British Society for Philosophy of Science Annual Conference, plenary speaker, Cardiff, UK, 2016 July.

14. M. Rédei: "Having a look at what a Bayesian Agent cannot see (Bayes Blind Spot)", Eighth Quadrennial Pittsburgh Fellows Conference, Lund, Sweden, 2016 July.

15. M. Rédei: "Categorial local quantum field theory" , Metaphysics and Fundamental Physics, Bristol, UK, 2016 June.

16. M. Rédei: "Categorial subsystem independence as morphism co-possibility", Local Quantum Physics and beyond - in memoriam Rudolf Haag, Hamburg, Germany, 2016 September.

17. L. E. Szabó: "Empirical Definitions of Spatiotemporal Conceptions", Eighth Quadrennial Pittsburgh Fellows Conference, Lund, Sweden, 2016 July.

18. L. E. Szabó: "The principle that ought to be generalized: the special principle of relativity", Sixth Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism, 2016 September.

19. L. E. Szabó: "'The laws of physics have the same form in all inertial frames of reference.' Philosopher reads physics.", Science Studies in Budapest, Budapest, 2016 October.

20. L. E. Szabó: "Mi is az az 'általános relativitás'?" (What exactly is the principle of 'general relativity'?) , 100 éves az általános relativitáselmélet, NKE, Budapest, 2016 November.

21. L. E. Szabó: "Az okozás ontológiája" (The ontology of causation), Az okság mint az „univerzum cementje", MTA, Budapest, 2016 November.

22. L. E. Szabó: "Time as constitutive a prior", Second Mini-symposium of the Philosophy of Physics Research Group, Institute of Philosophy, Hungarian Academy of Sciences, 2016 November.

23. M. Gömöri and L. E. Szabó: Operationalist Approach to Quantum Theory: Two Representation Theorems, *The British Society for the Philosophy of Science 2015 Annual Conference*, Manchester, 2–3 June 2015 .

24. M. Gömöri and G. Hofer-Szabó: On Einstein's Reality Criterion, *Third Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism*, Budapest, 21–22 May 2015.

25. M. Gömöri: Az erős Hume-i cenzúra hipotézise (The Strong Humean Censorship Hypothesis), *Ütközéspontok 2*, Budapest, 22–23 May.

26. M. Gömöri: A short remark on generalizing probability spaces in quantum mechanics, *Fourth Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism*, Krakow, 7–8 September 2015.

27. M. Gömöri, B. Gyenis, and G. Hofer-Szabó: On the Emergence of Macrostates, *Fourth Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism*, Krakow, 7–8 September 2015.

28. M. Gömöri: Facts and conventions on Poincaré's disc, *Logic, Relativity and Beyond*, Budapest, 9–13 August 2015.

29. Z. Gyenis, G. Hofer-Szabó, and M. Rédei: Conditioning using conditional expectation: the Borel-Kolmogorov paradox, *Fifth Conference of the European Philosophy of Science Association*, Düsseldorf, Germany, 2015 September.

30. G. Hofer-Szabó: On Bell's notion of local causality in local classical and quantum theory, *The Sixth Nagoya Winter Workshop on Reality and Measurement in Algebraic Quantum Theory*, Nagoya University, Nagoya, Japan, 2015 March.

31. G. Hofer-Szabó: "Common causal explanation and Bell inequality in algebraic quantum field theory", The Fifth Nagoya Winter Workshop on Quantum Information, Measurement and Foundations, Nagoya University, Nagoya, Japan, 2014 March.

32. M. Gömöri: "What is a physical 'and'?", Fourth LSE Graduate Conference in Philosophy of Probability, London School of Economics and Political Science, London, 2014 June.

33. M. Rédei: "Hilbert's 6th problem and constructive quantum field theory", 10th Congress of the International Society for the History of Philosophy of Science (HOPOS2014), Ghent, Belgium, 2014 July.

34. G. Gömöri: "A New Problem of Conjunctions", 2nd International Summer School in Philosophy of Physics: Probabilities in Physics, Lenzkirch-Saig, Germany, 2014 July.

35. M. Rédei: "Can Bayesian agents always be rational?", 8th European Congress of Analytic Philosophy, Bucharest, 2014 August 28-September 2.

36. L. E. Szabó: "Physico-Formalist Philosophy of Mathematics", 8th European Congress of Analytic Philosophy, Bucharest, 2014 August 28-September 2.

37. M. Gömöri: "A New Problem of Conjunctions", First Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism, Institute of Philosophy, Hungarian Academy of Sciences, Budapest, 2014 September.

38. G. Hofer-Szabó and M. Rédei: "The Borel–Kolmogorov paradox and conditional expectation", First Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism, Institute of Philosophy, Hungarian Academy of Sciences, Budapest, 2014 September.

39. Z. Gyenis and M. Rédei: "How much can a Bayesian agent learn?", First Workshop of the Budapest-Krakow Research Group on Probability, Causality and Determinism, Institute of Philosophy, Hungarian Academy of Sciences, Budapest, 2014 September.

40. G. Hofer-Szabó: "On Bell's notion of local causality in local classical and quantum theory", Relativistic causality, Department of Philosophy, Harvard University, Cambridge, USA, 2014 November.

41. M. Rédei: "A categorial approach to relativistic locality", Relativistic causality, Department of Philosophy, Harvard University, Cambridge, USA, 2014 November.

42. G. Hofer-Szabó: "Bell's local causality for philosophers", Biennial Meeting of the Philosophy of Science Association, Chicago, USA, 2014 November.

43. M. Gömöri and L.E. Szabó: "How to Move an Electromagnetic Field?", Biennial Meeting of the Philosophy of Science Association, Chicago, USA, 2014 November.

44. M. Rédei: organized a symposium on the Principal Principle and delivered a talk on "Measure theoretic analysis of consistency of the Principal Principle", Biennial Meeting of the Philosophy of Science Association, Chicago, USA, 2014 November.

45. M. Gömöri: "Only conjunction", Second Workshop of the Budapest–Krakow Research Group on Probability, Causality and Determinism, Jagiellonian University, Krakow, 2014 December.

46. L. E. Szabó: "Operationalist Approach to Quantum Theory", Second Workshop of the Budapest–Krakow Research Group on Probability, Causality and Determinism, Jagiellonian University, Krakow, 2014 December.

47. G. Hofer-Szabó: Bell's Local causality in algebraic field threory, Fourth Conference of the European Philosophy of Science Association, Helsinki, Finland, 2013 August.

48. G. Hofer-Szabó: Local causality in local classical and quantum threories, New Directions in the Philosophy of Physics, University of Bucharest, Romania, 2013 April.

49. G. Hofer-Szabó: Quantum correlations and causal explanation, Fulbright: Committed to the Future Conference, Budapest, 2013 March.

50. M. Rédei: "Interdependence of independence, dependence and locality in local relativistic quantum field theory" Relativistic Causality in Quantum Field Theory and General Relativity April 5-7, 2013, Center for Philosophy of Science, Pittsburgh, U.S.A.

51. M. Rédei: "Quantum theory as non-commutative probability theory" London Foundations Connection Conference on the Foundations of Quantum Theory May 7, 2013, Imperial College, London, UK.

52. M. Rédei: "Interdependence of independence, dependence and locality in local relativistic quantum field theory" Bucharest Colloquium in Analytic Philosophy 2013 New Directions in the Philosophy of Physics May 24-26, Bucharest, Romania.

53. M. Rédei: "Causality and Relativistic Quantum Field Theory" Between Rationalism and Empiricism. The Legacy of Erhard Scheibe. June 14-15, 2013, Dortmund, Germany.

54. M. Rédei: "Operational Independence Concepts in Algebraic Quantum Theory" 17th UK European Conference on Foundations of Physics 29-31 July, 2013, Munich, Germany.

55. M. Rédei and Z. Gyenis: "Defusing Bertrand's Paradox" EPSA2013 – The 4th Conference of the European Philosophy of Science Association August 28-31, Helsinki, Finland.

56. M. Rédei: "Facets of relativistic locality" Relativity Meets Quantum Theory November 28-29, 2013, London School of Economics, London, UK.

57. M. Rédei and Z. Gyenis: "A principled analysis of consistency of the Principal Principle" Choice Group Workshop October 18, 2013, London School of Economics, London, UK.

58. M. Gömöri, "Szuperholizmus", "Amirõl lehet beszélni...", Eötvös University, Budapest, February 2013.

59. M. Rédei, Operational independence in algebraic quantum field theory, *Philosophical Foundations of Quantum Field Theory*, February 2012, Cambridge, UK.

60. M. Rédei, Operational independence and operational separability in algebraic quantum field theory, *Third Nagoya Winter Workshop on Quantum Information, Measurement, and Foundations*, February 2012, Nagoya, Japan.

61. M. Rédei, Defusing Bertarnd's Paradox, *7th Quadrennial International Fellows Conference*, June 2012, Mugla, Turkey.

62. M. Rédei, Reichenbach's Common Cause Principle, *New Directions in Philosophy of Science*, October 2012, Bertinioro, Italy.

63. M. Rédei, Common cause explanations of Bell-type experiments, *Workshop on Causation, Disposition and Probabilities in Physics*, November 2012, Lausanne, Switzerland.

64. L. E. Szabó, A physicalist account of the truth of physical theory, *SILFS 2012 – International Conference of the Italian Society for Logic and Philosophy of Sciences*, November 2012, Milan.

65. L. E. Szabó and M. Gömöri, Does the relativity principle hold for all situations in relativistic physics?, *First International Conference on Logic and Relativity: honoring István Németi's 70th birthday,* September 2012, Budapest.

66. L. E. Szabó, Is the special principle of relativity a falsifiable statement?, *Seventh Quadrennial Pittsburgh Fellows Conference*, Mugla University, Turkey, June 2012.

67. L. E. Szabó, Fizikalista bevezetés az igazság ontológiájába, *Megértés és magyarázat*, January 2013, Kaposvár (Hungary).

68. M. Gömöri, The epistemology of the special principle of relativity, *SILFS 2012 – International Conference of the Italian Society for Logic and Philosophy of Sciences*, November 2012, Milan.

69. M. Gömöri and L. E. Szabó, What exactly does the special relativity principle assert?, *First International Conference on Logic and Relativity: honoring István Németi's 70th birthday,* September 2012, Budapest.

70. M. Gömöri, 'Tér', 'idő', 'sebesség' – az operacionális jelentés határai, *Amiről nem lehet beszélni...*, April 2012, Budapest

71. M. Gömöri, A relativitás elve – esettanulmány egy alapvető fizikai elv megértésre, *Megértés és magyarázat*, January 2013, Kaposvár (Hungary).

72. G. Hofer-Szabó, M. Rédei, Common Cause Explanations of Bell-type Experiments, *Workshop on Causation, Dispositions and Probabilities in Physics and Biology*, University of Lausanne, Switzerland, 2012

73. G. Hofer-Szabó, Bell inequality and common causal explanation in algebraic quantum field theory, *Seventh Quadrennial Pittsburgh Fellows Conference*, Mugla University, Turkey, June 2012.

Seminar talks

1. G. Hofer-Szabó: "A Bell-egyenlőtlenségek" (Bell inequalities), Department Seminar, Institute of Theoretical Physics, Budapest University of Technology and Economics, 2016 November.

2. G. Hofer-Szabó: "Julian Barbour időtlen világa" (The timeless world of Julian Barbour), Emlékezet és felejtés, Bolyai Társaság, Babes-Bolyai Egyetem, Kolozsvár (Cluj-Napoca), Romania, 2016 October.

3. G. Hofer-Szabó: "Einstein realitáskritériuma" (Einstein's reality criterion), Department Seminar, Institute of Philosophy and History of Science, Budapest University of Technology and Economics, 2016 October.

4. G. Hofer-Szabó: "The Common Cause Principle", Analytic Philosophy Department, Czech Academy of Sciences, Prague, Czech Republic, 2016 September.

5. G. Hofer-Szabó: "How man and nature shake hands: the role of noconspiracy in physical theories", Theoretical Philosophy Forum, Department of Logic, Eötvös University Budapest, 2016 March.

6. G. Hofer-Szabó: "How man and nature shakes hand: the role of noconspiracy in physical theories", Institute of Philosophy, Jagiellonian University, Krakow, Poland, 2016 March.

7. M. Gömöri: "Reichenbach's Common Cause Principle from a Humean perspective", Theoretical Philosophy Forum, Department of Logic, Eötvös University Budapest, 2016 March.

8. M. Rédei: "Properties of Bayesian learning based on conditional expectation as a conditioning device" (jointly with Z. Gyenis), Institute of Philosophy, Hungarian Academy of Sciences, 2016 January.,

9. M. Rédei: "John von Neumann: episodes from his life and comments on his work", Cohn Institute Colloquium, Tel Aviv University, Israel, April 2016.

10. M. Rédei: "Why Bertrand's Paradox is not paradoxical but is felt so", Bar Hillell Colloquium, The Hebrew University of Jerusalem, Jerusalem, Israel, April 2016.

11. M. Rédei: "Having a look at what a Bayesian Agent cannot see (Bayes Blind Spot)" (jointly with Z. Gyenis), Institute of Philosophy, Eötvös University, Budapest, Hungary, April 2016.

12. M. Rédei: "General properties of Bayesian learning based on conditional expectation as a conditioning device", Popper Seminar, London School of Economics, London, UK, October 2016.

13. L. E. Szabó: "On the diffeomorphism invariance of general relativity", Theoretical Philosophy Forum, Department of Logic, Eötvös University Budapest, 2016 October.

14. G. Hofer-Szabó: "Local causality in local physical theories," Causality and Non-locality in Physics, Quantum and Classical, University of the Basque Country, San Sebastián, Spain, 2015 November.

15. G. Hofer-Szabó: "Einstein's reality criterion,"Department of Philosophy, University of Haifa, Haifa, Israel, 2015 October.

16. G. Hofer-Szabó: "On Einstein's reality criterion in an operational approach," Munich Center for Mathematical Philosophy, Munich, Germany, 2015 May.

17. Z. Gyenis, G. Hofer-Szabó, and M. "Rédei: The Borel-Kolmogorov Paradox and conditional expectations", Theoretical Philosophy Forum, Eötvös University Budapest, March 2015.

18. M. Gömöri: "Only conjunction", Theoretical Philosophy Forum, Eötvös University Budapest, April 2015.

19. M. Rédei: "John von Neumann: episodes from his life and comments on his work", Institute of Philosophy, Research Centre for the Humanities, Budapest, April 21, 2015.

20. M. Rédei: "Categorial approach to relativistic locality", Munich Centre for Mathematical Philosophy Colloquium, Ludwig Maximilans University, Munich, Germany, May 13, 2015.

21. M. Rédei: Three Seminars in Munich Centre for Mathematical Philosophy on foundations of probability, Ludwig Maximilans University, Munich, Germany:

    (a) "Bertrand's Paradox", May 18, 2015
    (b) "The Borel-Kolmogorov Paradox and conditional expectations", June 1, 2015 c.
    (c) "Quantum probability theory", June 15, 2015

22. M. Rédei: "The Borel-Kolmogorov Paradox and conditional expectations", Department of Philosophy, University of Salzburg, Salzburg, Austria, June 2, 2015.

23. M. Rédei: "Reichenbach's Common Cause principle", Dusseldorf Center for Philosophy of Science, Heinrich Heine University, Dusseldorf, Germany, June 16, 2015.

24. M. Rédei: "Informal, early reception of Imre Lakatos' 'Proofs and Refutations'", Institute for Research in the Humanities, University of Bucharest, Romania, December 17, 2015

25. M. Rédei: "Defusing Bertrand's paradox", Popper Seminar, LSE, London, 2014 March.

26. M. Rédei, "John von Neumann's life and work", Inaugural Lecture, LSE, London, 2014 March.

27. L. E. Szabó: "Fizikai elméletek fizikalista értelmezése", Institute of Philosophy, Research Center for the Humanities, Budapest, 2014 March.

28. Z. Gyenis and M. Rédei: "Can Bayesian agents always be rational?", Theoretical Philosophy Forum, Eötvös University Budapest, 2014 March.

29. G. Hofer-Szabó: "Bell's local causality is a Causal Markov Condition", Munich Center for Mathematical Philosophy, Munich, Germany, 2014 April.

30. M. Rédei: "Can Bayesian agents always be rational?", Vienna Circle Institute, University of Vienna, Vienna, 2014 April.

31. P. Fazekas, B. Gyenis, G. Hofer-Szabó, and G. Kertész: "Causation: a dynamical systems approach", Theoretical Philosophy Forum, Eötvös University Budapest, 2014 April.

32. G. Hofer-Szabó and P. Vecsernyés: "Bell's local causality in local classical and quantum theory", Theoretical Philosophy Forum, Eötvös University Budapest, 2014 May.

33. G. Hofer-Szabó: "Bell inequality and common causal explanation in algebraic quantum field theory", Department of Philosophy, University of Bristol, UK, 2014 May.

34. G. Hofer-Szabó: "Bell's local causality in local classical and quantum theory", London Foundations Connection, London School of Economics, London, UK, 2014 May.

35. G. Hofer-Szabó: "Noncommutative common causal explanation and the Bell inequalities, Department of Philosophy, Durham University, UK, 2014 May.

36. M. Gömöri: "How to move an electromagnetic field?", Sigma Club, LSE, London, 2014 June.

37. M. Rédei: "John von Neumann: The power of mathematics and moral responsibility of scientists", Centre for Logic and Philosophy of Science, University of Bucharest, Bucharest, 2014 October.

38. G. Hofer-Szabó: "Bell's local causality in local physical theories", Department of Philosophy, Hebrew University, Jerusalem, Israel, 2014 November.

39. L. E. Szabó: "Operationalist Approach to Quantum Theory: Two Representation Theorems", Theoretical Philosophy Forum, Eötvös University Budapest, 2014 November.

40. G. Hofer-Szabó: Locality and Common Cause Principle, Department of Philosophy, University of Belgrade, Belgrade, Serbia, 2013 November.

41. G. Hofer-Szabó: Játék és kvantumelmélet (Game and Quantum Theory), Bolyai Társaság, Babes-Bolyai Egyetem, Kolozsvár (Cluj-Napoca), Romania, 2013 October.

42. G. Hofer-Szabó: On the localization of the common cause, Foundations of Physics Conference, Ludwig Maximilians University, Munich, Germany, 2013 July.

43. G. Hofer-Szabó: Frequency interpretation of probability, Institute of Philosophy, Jagiellonian University, Cracow, Poland, 2013 June.

44. G. Hofer-Szabó: Von Mises's theory of probability, Institute of Philosophy, Jagiellonian University, Cracow, Poland, 2013 June.

45. G. Hofer-Szabó: Local causality, Theoretical Philosophy Forum, Eötvös University, Budapest, May 2013.

46. M. Gömöri, What every picture must have in common, Logic and Philosophy of Mathematics Seminar, Eötvös University, Budapest, June 2013

47. L. E. Szabó: "The laws of physics have the same form in all inertial frames of reference.", Theoretical Philosophy Forum, Eötvös University, Budapest, May 2013.

48. L. E. Szabó: On the meaning of the special relativity principle, Sigma Club LSE, London, June 2013.

49. G. Hofer-Szabó, Common Causal explanation and Bell inequality in algebraic quantum field theory, *Philosophy of Physics Seminar*, University of Oxford, 2012.

50. G. Hofer-Szabó, Bell inequality and common causal explanation, *Sigma Club*, London School of Economics, London, 2012.

51. G. Hofer-Szabó, Quantum correlations and Bell inequalities in algebraic quantum field theory, Munich Center for Mathematical Philosophy, Munich, 2012.

52. G. Hofer-Szabó, Bell inequalities in algebraic quantum field theory, *Lunch-time seminar*, Center for Philosophy of Science, University of Pittsburgh, 2012.

53. G. Hofer-Szabó, Bell inequalities and common causes in algebraic quantum field theory, *Southern California Philosophy of Physics Group*, University of California, Irvine, USA, 2012.

54. G. Hofer-Szabó, Noncommutative Common Cause Principle in algebraic quantum field theory, *Logic and Philosophy of Science Research Group*, University of Maryland, Washington, USA, 2012.

55. G. Hofer-Szabó, Trying to understand a new no-go result: the PBR theorem, *Theoretical Philosophy Forum*, Eötvös University, Budapest, October 2012.

56. G. Hofer-Szabó, Bell inequality in algebraic quantum field theory, *Theoretical Philosophy Forum*, Eötvös University, Budapest, May 2012

57. M. Gömöri, Only one kind of convention, *Theoretical Philosophy Forum*, Eötvös University, Budapest, December 2012.

58. M. Gömöri, Ontological incompleteness of classical electrodynamics, *Theoretical Philosophy Forum*, Eötvös University, Budapest, May 2012.

59. Z. Gyenis, M. Rédei, Why 'Bertrand's paradox' is not paradoxical, *Theoretical Philosophy Forum*, Eötvös University, Budapest, December 2012.

60. M. Rédei, Reichenbach's Common Cause Principle, *British Society for Philosophy of Science Colloquium Speaker*, March, 2012.

61. M. Rédei, Einstein meets von Neumann: operational independence and operational separability in algebraic quantum field theory, *Theoretical Philosophy Forum*, Eötvös University, Budapest, April 2012.

62. M. Rédei, Five lectures on foundations of algebraic quantum mechanics and algebraic quantum field theory, Graduate School of Information Science, Nagoya University, Nagoya, Japan; (series of 5 lectures) August 22-24, 2012.

    (a) Lecture 1: Hilbert's 6th problem and the axiomatic approach to physical theories

    (b) Lecture 2: Operator algebra theory as non-commutative probability theory

    (c) Lecture 3: Algebraic quantum field theory and some of its features

    (d) Lecture 4: Causal completeness of algebraic quantum field theory

    (e) Lecture 5: The independence hierarchy in algebraic quantum field theory