

Curriculum Vitae

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2001-present: Associate Professor, Center for Complex Systems & Brain Sciences and Department of Physics, Florida Atlantic University, Boca Raton, FL

1995-2001: Assistant Professor, Center for Complex Systems & Brain Sciences and Department of Physics, Florida Atlantic University, Boca Raton, FL

1994-1995: Akademischer Rat (tenured staff), Institut für Theoretische Physik und Synergetik, Universität Stuttgart, Stuttgart, Germany

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Ph.D. (Theoretical Physics), Universität Stuttgart, Stuttgart, Germany, 1990

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Publications

Textbooks:

Armin Fuchs: *Nonlinear Dynamics in Complex Systems: Theory and Applications for the Life-, Neuro- and Natural Sciences*, Springer Verlag, Berlin (2013)

Edited Books:

Armin Fuchs, Viktor K. Jirsa, eds.: *Coordination: Neural Behavioral and Social Dynamics*, Springer Verlag, Berlin (2008)

Refereed Journal Articles:

1. M. Jing, T.M. McGinnity, S. Coleman, A. Fuchs, J.A.S. Kelso: ‘Longitudinal Study of Temporal Changes in Diffusion Patterns in Mild Traumatic Brain Injury Using Semi-Blind Source Separation’, *IEEE Transactions on Biomedical Engineering*, revised version submitted
2. V. Murzin, A. Fuchs, J.A.S. Kelso: ‘Detection of Correlated Sources in EEG Using Combination of Beamforming and Surface Laplacian Methods’, *Journal of Neuroscience Methods*, 218: 96-102 (2013)
3. V. Kostrubiec, P.G. Zanone, A. Fuchs, J.A.S. Kelso: ‘Beyond the blank slate: routes to learning new coordination patterns depend on the intrinsic dynamics of the learner – experimental evidence and theoretical model’, *Frontiers in Human Neuroscience*, 6: 1-14 (2012)
4. M. Jing, T.M. McGinnity, S. Coleman, H. Zhang, A. Fuchs, J.A.S. Kelso: ‘Enhancement of fibre orientation distribution reconstruction in diffusion weighted imaging by single channel blind source separation’, *IEEE Transactions on Biomedical Engineering*, 59: 363-373 (2012)
5. V. Murzin, A. Fuchs, J.A.S. Kelso: ‘Anatomically Constrained Minimum Variance Beamforming Applied to EEG’, *Experimental Brain Research*, 214: 515-528 (2011)
6. S. Charron, A. Fuchs, O. Oullier: ‘Exploring brain activity in neuroeconomics’, *Revue d’Économie Politique*, 118: 97-124 (2008)
7. J.M. Mayville, A. Fuchs, J.A.S. Kelso: ‘Neuromagnetic Motor Fields Accompanying Self-paced Rhythmic Finger Movements of Different Rates’, *Experimental Brain Research*, 166: 190-199 (2005)
8. D.G. Nair, A. Fuchs, S. Burkart, F.L. Steinberg, J.A.S. Kelso: ‘Assessing recovery in middle cerebral artery stroke using functional MRI’, *Brain Injury*, 19: 1165-1176 (2005)
9. T.P. Zanto, E.W. Large, A. Fuchs, J.A.S. Kelso: ‘Gamma-Band Responses to Perturbed Auditory Sequences: Evidence for Synchronization of Perceptual Processes’, *Music Perception*, 22: 535-552 (2005)
10. D.G. Nair, K.L. Purcott, A. Fuchs, F. Steinberg, J.A.S. Kelso: ‘Cortical and cerebellar activity of the human brain during imagined and executed unimanual and bimanual action sequences: A functional MRI study’, *Cognitive Brain Research*, 15: 250-260 (2003)

11. F.W. Carver, A. Fuchs, K.J. Jantzen, J.A.S. Kelso: 'Spatiotemporal analysis of neuromagnetic activity associated with rhythmic auditory stimulation: rate dependence and transient to steady state', *Clinical Neurophysiology*, 113: 1921-1931 (2002)
12. J.M. Mayville, K.J. Jantzen, A. Fuchs, F. Steinberg, J.A.S. Kelso: 'Cortical and subcortical networks underlying syncopated and synchronized coordination revealed using fMRI', *Human Brain Mapping*, 17: 214-219 (2002)
13. V.K. Jirsa, K.J. Jantzen, A. Fuchs, J.A.S. Kelso: 'Spatiotemporal forward Solutions of the EEG and MEG using network modeling', *IEEE Transaction on Medical Imaging*, 21: 493-504 (2002)
14. K.J. Jantzen, A. Fuchs, J.M. Mayville, L. Deecke, J.A.S. Kelso: 'Neuromagnetic activity in alpha and beta bands reflect learning-induced-increases in coordinative stability', *Clinical Neurophysiology*, 112: 1685-1697 (2001)
15. J.M. Mayville, A. Fuchs, M. Ding, D. Cheyne, L. Deecke, J.A.S. Kelso: 'Event-related changes in neuromagnetic activity associated with syncopation and synchronization timing tasks', *Human Brain Mapping*, 14: 65-80 (2001)
16. A. Fuchs, V.K. Jirsa: 'The HKB Model Revisited: How Varying the Degree of Symmetry Controls Dynamics', *Human Movement Science*, 19: 425-449 (2000)
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21. J.M. Mayville, S.L. Bressler, A. Fuchs, J.A.S. Kelso: 'Spatiotemporal Reorganization of Electric Activity in the Human Brain Associated with a Timing Transition in Rhythmic Auditory-Motor Coordination', *Experimental Brain Research*, 127: 371-381 (1999)
22. J.A.S. Kelso, A. Fuchs, R. Lancaster, T. Holroyd, D. Cheyne, H. Weinberg: 'Dynamic Cortical Activity in the Human Brain Reveals Motor Equivalence', *Nature*, 392: 814-818 (1998)
23. V.K. Jirsa, A. Fuchs, J.A.S. Kelso: 'Connecting cortical and behavioral dynamics: bimanual coordination', *Neural Computation*, 10: 2019-2045 (1998)
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25. J.J. Buchanan, J.A.S. Kelso, A. Fuchs: 'Coordination dynamics of trajectory formation', *Biological Cybernetics*, 74: 41-54 (1996)
26. J.A.S. Kelso, A. Fuchs: 'Selforganizing dynamics of the human brain: Critical Instabilities and Sil'nikov chaos', *Chaos*, 5: 64-69 (1995)

27. A. Fuchs, J.A.S. Kelso: 'A Theoretical Note on Models of Interlimb Coordination', *Journal of Experimental Psychology: Human Perception and Performance*, 20: 1088-1097 (1994)
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30. H. Haken, J.A.S. Kelso, A. Fuchs, A.S. Pandya: 'Dynamic Pattern Recognition of Coordinated Biological Motion', *Neural Networks*, 3: 390-401 (1990)
31. H. Haken, A. Fuchs, W. Banzhaf: 'Mustererkennung durch synergetische Computer (Pattern Recognition by Synergetic Systems)', *Design & Elektronik*, 6: 93-99, 7: 82-86 (1989)
32. A. Fuchs, H. Haken: 'Nonequilibrium Phase Transitions and Associative Memory. Numerical Results', *Zeitschrift fr Physik B*, 71: 519-520 (1988)
33. A. Fuchs, H. Haken: 'Pattern Recognition and Associative Memory as Dynamical Processes in a Synergetic System I', *Biological Cybernetics*, 60: 17-22 (1988)
34. A. Fuchs, H. Haken: 'Pattern Recognition and Associative Memory as Dynamical Processes in a Synergetic System II', *Biological Cybernetics*, 60: 107-109 (1988)
35. A. Fuchs: 'Synergetics, Selfsimilarity and Computergraphics', *Zeitschrift fr Naturforschung*, 42a: 319-323 (1986)
36. A. Fuchs, G. Mahler: 'Model Study on disordered one-dimensional Microstructures', *Solid State Communications*, 55: 1035-1037 (1985)

Book Chapters:

1. A. Fuchs: 'Spatial Spectral Methods', in: *Encyclopedia of Computational Neuroscience*, D. Jaeger, R. Jung, eds., Springer Verlag, Berlin, under review (6 pages)
2. A. Fuchs: 'Dynamical systems in one and two dimensions: a geometrical approach', in: *Nonlinear dynamics in human behavior*, R. Huys, ed., Springer Verlag, Berlin, pp. 1-34 (2010)
3. A. Fuchs, J.A.S. Kelso: 'Movement Coordination', in: *Encyclopedia of Complexity and Systems Science*, B. Meyers, ed. in chief, Springer Verlag, Berlin, pp. 5718-5736 (2009)
4. A. Fuchs, V.K. Jirsa: 'Scott Kelso's Contributions to Our Understanding of Coordination', in: *Coordination: Neural, Behavioral and Social Dynamics*, A. Fuchs, V.K. Jirsa, eds., Springer Verlag, Berlin, pp. 327-346 (2008)
5. A. Fuchs: 'Beamforming and Its Applications to Brain Connectivity', in: *Handbook of Brain Connectivity*, V.K. Jirsa, R.A. McIntosh, eds., Springer Verlag, Berlin, pp. 357-378 (2007)
6. P. Ferrari, A. Fuchs, D.O. Cheyne, K.J. Jantzen, J.A.S. Kelso: 'Cortical Networks Underlying Coordinated Movements by Magnetoencephalographic Beamforming', in: *New Frontiers in Biomagnetism*, D. Cheyne, B. Ross, G. Stroink, eds., Elsevier, pp. 337-340 (2006)

7. A. Fuchs: 'Combining Brain Imaging Technologies: Using Brain Surfaces', in: *Biomag 2002, Proceedings of the 13th International Conference on Biomagnetism*, H. Nowak, J. Haueisen, F. Geißler, R. Huonker, eds., VDE Verlag, Berlin, pp. 878-880 (2002)
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10. J.A.S. Kelso, V.K. Jirsa, A. Fuchs: 'Traversing Scales of Brain and Behavioral Organization I: Concepts and Experiments', in: *Analysis of Neurophysiological Brain Functioning*, C. Uhl, ed., Springer, Berlin (1999)
11. A. Fuchs, V.K. Jirsa, J.A.S. Kelso: 'Traversing Scales of Brain and Behavioral Organization II: Analysis and Reconstruction', in: *Analysis of Neurophysiological Brain Functioning*, C. Uhl, ed., Springer, Berlin (1999)
12. V.K. Jirsa, J.A.S. Kelso, A. Fuchs: 'Traversing Scales of Brain and Behavioral Organization III: Theoretical Modeling', in: *Analysis of Neurophysiological Brain Functioning*, C. Uhl, ed., Springer, Berlin (1999)
13. R. Haas, A. Fuchs, H. Haken, E. Horvath, A.S. Pandya, J.A.S. Kelso: 'Recognition of dynamic patterns by a synergetic Computer', in: *Progress in Neural Networks*, O.M. Omidvar, ed., Ablex Publishing Corporation, Norwood, NJ (1995)
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15. A. Fuchs, J.A.S. Kelso: 'Pattern formation in the human brain during qualitative changes in sensorimotor coordination', in: *Proceedings of the World Congress on Neural Networks 1993*, vol. 4: 476-479 (1993)
16. A. Fuchs, J.A.S. Kelso: 'Self-organization in brain and behavior: Critical instabilities and dynamics of spatial modes', in: *Nonlinear Dynamical Analysis of the EEG*, B.H. Jansen, M.E. Brandt, eds., World Scientific, Singapore (1992)
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18. A. Fuchs, H. Haken: 'Synergetic Systems for Pattern Recognition', in: *First Symposium on Systematology, Journal of Shanghai Institute of Mechanical Engineering*, 13: 9-22 (1991)
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23. R. Friedrich, A. Fuchs, H. Haken: 'Synergetic Analysis of Spatiotemporal EEG-Patterns', in: *Nonlinear Wave Processes in Excitable Media*, A.V. Holden et al., eds., Plenum Press, New York (1989)
24. A. Fuchs, H. Haken: 'The Synergetic Approach to Pattern Recognition', in: *Irreversible Processes and Selforganization*, W. Ebeling, H. Ulbricht, eds., Teubner Verlag, Leipzig (1989)
25. A. Fuchs, H. Haken: 'Pattern Recognition and Associative Memory as a Dynamical Process in Nonlinear Systems', in: *Dynamic Patterns in Complex Systems*, J.A.S. Kelso, A.J. Mandell, M.F. Shlesinger, eds., World Scientific, Singapore (1988)
26. A. Fuchs, H. Haken: 'Computer Simulation of Pattern Recognition as a Dynamical Process of a Synergetic System', in: *Neural and Synergetic Computers*, H. Haken, ed., Springer, Berlin (1988)
27. A. Fuchs, H. Haken: 'Pattern Recognition and Pattern Formation as Dual Processes', in: *Proceedings of the International Conference on Neural Nets I*, SOS Printing, San Diego, CA (1988)
28. A. Fuchs, R. Friedrich, H. Haken, D. Lehmann: 'Spatiotemporal Analysis of Multi-channel Alpha EEG Map Series', in: *Computational Systems - Natural and Artificial*, H. Haken, ed., Springer, Berlin (1987)