

## CURRICULUM VITAE

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### PERSONAL DATA

<b>DATE OF BIRTH</b>	29 June 1960
<b>CITIZENSHIP</b>	Russia
<b>FIELD OF RESEARCH</b>	Nonlinear dynamics, Synchronization, Mathematical Modeling, Controlling Chaos, Pattern Formation, Theory of Bifurcations, Computational Neuroscience, Parallel Programming

### ACADEMIC DEGREES

12/2004	Doctor of Physical and Mathematical Sciences (Doctror Habil.), Nizhny Novgorod University, Nizhny Novgorod, Russia. «Synchronization in heterogeneous ensembles of locally diffusively coupled regular and chaotic oscillators»
01/1989	Canditate of Physical and Mathematical Sciences (Ph.D), Institute of Space Research, Russian Academy of Sciences, Moscow, Russia Research and development of the system of mathematical modeling of dynamics of nonlinear networks of rotators



10/2001 - 12/2001	Researcher, Potsdam University, Germany
10/2000 - 12/2000	Researcher, Potsdam University, Germany
10/1999 - 12/1999	Research Associate, Boston University, USA
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11/1995 - 02/1996	Researcher, Potsdam University, Germany
01/1995 - 10/1995	Researcher, Technical University of Vienna, Austria
09/1994 - 11/1994	Researcher, Technical University of Darmstadt, Germany

## SCIENTIFIC METRICS

### CITATION INDEX:

Web of Science H= 3044;

Scopus H=3044;

РИИЦ H=3912.

### H-INDEX:

Web of Science H= 21;

Scopus H=21;

РИИЦ H=22.

## SAMPLE PUBLICATIONS (incl. two books, two reports)

1. Afraimovich V.S., Nekorkin V.I., Osipov G.V., and Shalfeev V.D. *Stability, structures and chaos in nonlinear synchronization networks*. Singapore: World Scientific, 1994.
2. Osipov G.V., Kurths J., and Zhou Ch. *Synchronization in Oscillatory Networks*. Springer Verlag: Berlin. 2007.
3. Alexeev A.A, Osipov G.V., Shalfeev V.D. Effects of square-wave modulation on CNN patterns. *IEEE Tr. Circuit and Systems-I: Fundamental theory and applications*. 1995.V.42,p.700.
4. Osipov G.V., Shalfeev V.D. The evolution of spatio-temporal disorder in a chain of unidirectionally coupled Chua's circuit. *IEEE Tr. Circuit and Systems-I: Fundamental theory and applications*. 1995. V.42,p.687.
5. Osipov G.V. , Shalfeev V.D. Chaos and structures in a chain of mutually coupled Chua's circuits. *IEEE Tr. Circuit and Systems-I: Fundamental theory and applications*. 1995. V.42,p.693.
6. Osipov G.V., Sushchik M.M. Coherent structures in coupled chain of self-excited oscillators. *Physics Letters A*. 1995. V.201. p.205.
7. Shalfeev V.D., Osipov G.V., Kuznetsov A.S. Spatio-temporal dynamics in Chua's circuits network. *Proc. of 3rd Int. Spec. Workshop NDES*. Dublin, Ireland, 1995. p.299.
8. Osipov G.V. and Sushchick M.M., Coherent structures in coupled chain of self-excited oscillators. *J. of Technical Physics*, v.66, 1996. p.1.
9. Osipov G.V., Pikovsky A.S., Rosenblum M.G., and Kurths J. Phase synchronization effect in a lattice of nonidentical Rossler oscillators. *Physical Review E*. 1997. V.55. P.2253.

10. Osipov G.V., Sushchik M.M. The effect of natural frequency distribution on cluster synchronization in oscillator arrays. *IEEE Tr. circuits and systems-I: Fundamental theory and applications*. 1997. V.44. p.1006.
11. Pikovsky A., Rosenblum M., Osipov G., and J.Kurths, Phase synchronization of chaotic oscillators by external driving. *Physica D*. 1997. V.104. p.219.
12. Pikovsky A., Osipov G., Rosenblum M., Zaks M., and J.Kurths, Attractor-repeller collision and eyelet intermittency at the transition to phase synchronization. *Physical Review Letters*, v.79. 1997. p.47.
13. Pikovsky A., Rosenblum M., Zaks M., Osipov G., and J.Kurths, Phase synchronization of chaotic oscillations in terms of periodic orbits. *Chaos*,v.6,1997. p.141.
14. Osipov G.V. and Sushchik M.M. Synchronized clusters and multistability in arrays of oscillators with different natural frequencies. *Physical Review E*.1998. V.58. p.7198.
15. Osipov G.V., Shulgin B.V., and Collins J.J. Controlled movement and suppression of spiral waves in excitable media. *Physical Review E*. 1998. V.58. p.6955.
16. Osipov G.V., Glatz L., Troger H. Suppressing chaos in Duffing oscillator by impulsive action. *Chaos, solitons and fractals*. 1998. V.9. p.307.
17. Osipov G.V., Kozlov A.K., Shalfeev V.D. Impulse control of chaos in continuous systems. *Physics Letters A*. 1998. V.247. p.119.
18. Osipov G.V., Collins J.J. Using weak impulses to suppress traveling waves in excitable media. *Physical Review E*. 1999. V.60. p.54.
19. Pradines J., Osipov G.V., Collins J.J. Coherence resonance in excitable and oscillatory systems: The essential role of slow and fast dynamics. *Physical Review E*. 1999. V.60. p.6407.
20. Osipov G.V., Stamp A., Collins J.J. Suppressing arrhythmias in cardiac models with overdrive pacing. *Proc.of Int.Conf. "Control of oscillations and chaos"*. St-Petersburg, Russia, 2000.p.453.
21. Boccaletti S., Kurths J., Osipov G.V., Valladares D.L., and Zhou Ch. The synchronization of chaotic systems. *Physics Reports*. 2002. V.366. p.1.
22. Osipov G.V., Pikovsky A.S., Kurths J. Phase synchronization of chaotic rotators. *Physical Review Letters*. 2002.V.88.p.054102.
23. Osipov G.V., Kurths J. Regular and chaotic phase synchronization of coupled circle maps. *Physical Review E*. 2002. V.65. p.016216.
24. Rubchinsky L.L., Sushchik M.M., Osipov G.V. Patterns in networks of oscillators formed via synchronization and oscillator death. *Mathematics and Computers in Simulation*. 2002. V.58. p.443.
25. Stamp A.T., Osipov G.V., Collins J.J. Suppressing arrhythmias in cardiac models using overdrive pacing and calcium channel blockers. *Chaos*. 2002. V.12. p.931.
26. Rosenblum M.G., Pikovsky A.S., Kurths J., Osipov G.V., KissI.Z., Hudson J.L. Locking-based frequency measurement and synchronization of chaotic oscillators with complex dynamics. *Physical Review Letters*. 2002. V.89. p.2641021.
27. Osipov G.V., Hu B., Zhou Ch., Ivanchenko M.V., and Kurths J. Three types of transitions to phase synchronization in coupled chaotic oscillators. *Physical Review Letters*. 2003. V.91. p.0241041.
28. Hu B., Osipov G.V., Yang H.-L., Kurths J. Oscillatory and rotatory synchronization of chaotic autonomous phase systems. *Physical Review E*. 2003. V.67. p.0662161.
29. Osipov G.V., Belykh V.N. Synchronization in ensembles of feedback coupled oscillators. *Proc. of 11th Int. Spec. Workshop NDES. Scuol, Switzerland*. 2003. p.185.

30. Ivanchenko M.V., Osipov G.V., Shalfeev V.D., Kurths J. Synchronization of two non-scalar-coupled limit-cycle oscillators. *Physica D*. 2004. V.189. p.8.
31. Ivanchenko M.V., Osipov G.V., Shalfeev V.D., Kurths J. Phase synchronization of chaotic intermittent oscillations. *Physical Review Letters*. 2004. V.92. p.134101.
32. Ivanchenko M.V., Osipov G.V., Shalfeev V.D., and Kurths J. Phase synchronization in ensemble of bursting oscillators. *Physical Review Letters*. 2004. V.93. p.134101.
33. Belykh V.N., Osipov G.V., Kuklaender N., Blasius B., and Kurths J. Automatic control of phase synchronization in coupled complex oscillators. *Physica D*. 2005. v.200. p.81.
34. Osipov G.V., Ivanchenko M.V., Kurths J., Hu B. Synchronized chaotic intermittent and spiking behavior in coupled map chains. *Physical Review E*. 2005. V.71.p.056209.
35. Kurths J., Carmen Romano M., Thiel M., Osipov G.V., Ivanchenko M.V., Kiss I.Z., and Hudson J.L. Synchronization analysis of coupled noncoherent oscillators. *Nonlinear Dynamics*.2006 V.44.p.135.
36. Ivanchenko M.V., Osipov G.V., Shalfeev V.D., and Kurths J. A network mechanism for burst generation. *Physical Review Letters*. 2007. V.98.p.108101.
37. Kanakov O.I, Osipov G.V., Chan C.-K., and Kurths J. Cluster synchronization and spatio-temporal dynamics in networks of oscillatory and excitable Luo-Rudy cells. *Chaos*. 2007. V.17.p.015111.
38. Belykh V.N., Osipov G.V., and Kurths J.. Feedback control principles and phase synchronization in *Handbook of Chaos Control. Communicating with chaos, chaos synchronization*, eds. E. Scholl and H.G. Schuster. Wiley-VCH: Berlin. 2007.
39. Osipov G.V., Kanakov O.I., Chan C.-K., Kurths J., Dana S.K., Averyanova L.S., and Petrov V.S. "Synchronization phenomena in networks of oscillatory and excitable Luo-Rudy cells" in *Springer Series: Complex Dynamics in Physiological Systems*, Springer, 2008.
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41. Komarov M.A., Osipov G.V., and Suykens J.A.K. Variety of synchronous regimes in neuronal ensembles. *Chaos*. 2008.V.18.p.037121.
42. Belykh V.N., Osipov G.V., Petrov V.S., Suykens J.A.K., and Vandewalle J. Cluster synchronization in oscillatory networks. *Chaos*.2008.V.18.p.037106.
43. Kryukov A.K., Osipov G.V., Polovinkin A.V., and Kurths J. Synchronous regimes in ensembles of coupled Bonhoeffer-van der Pol oscillators, *Physical Review E*. 2009.V.79.P.046209.
44. Komarov M.A., Osipov G.V., Suykens J.A.K., and Rabinovich M.I. Numerical studies of slow rhythms emergence in neural microcircuits: bifurcations and stability. *Chaos*. 2009.V.19. P.015107.
45. Petrov V.S., Osipov G.V., and Suykens J.A.K. Influence of passive elements on the dynamics of oscillatory ensembles of cardiac cells. *Physical Review E*. 2009.V.79 P.046219.
46. Kryukov A.K., Kanakov O.I. and Osipov G.V. Synchronization waves in weak-nonlinear oscillatory ensembles. *Applied Nonlinear Dynamics*, 2009, V.17 N1 P.13 (in Russian).
47. Kryukov A.K, Osipov G.V. and Polovinkin A.V. Variety of synchronous regimes in ensembles of nonidentical oscillators: Two coupled elements. *Applied Nonlinear Dynamics*, 2009, V.17 N2 P.16 (in Russian).

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50. Chen W., Cheng S.C., Avalos E., Drugova O.V., Osipov G.V., P.-Y.Lai, Chan C.-K. Synchronization in growing heterogeneous media. *Europhysics Letters*. 2009. V.86. P.18001.
51. Komarov M.A., Osipov G.V., Suykens J.A.K. Sequentially activated groups in neural networks. *Europhysics Letters*. 2009.V.86. P.60006.
52. Petrov V.S., Osipov G.V., Kurths. J. Distant synchronization through a passive medium, *Phys. Rev. E*. 2010. V.82. P.026208.
53. Petrov V.S. and Osipov G.V. Influence of passive elements on the synchronization of oscillatory ensembles. *Applied Nonlinear Dynamics*. 2010. V.18. P.6. (in Russian).
54. Komarov M.A., Osipov G.V., Suykens J.A.K. Metastable states and transient activity in ensembles of excitatory and inhibitory elements. *Europhys. Lett*. 2010. V.91. 20006.
55. Komarov M.A., Osipov G.V., Burtsev M.S. Adaptive functional systems: Learning with chaos. *Chaos*. 2010. V.20. P.045119.
56. Komarov M.A., Osipov G.V. Generation of slow rhythms and sequential activity in ensembles of neuron-like oscillators. *Applied Nonlinear Dynamics*. 2010. V.18 (in Russian).
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58. Petrov V.S., Lang Di, Osipov G.V., Lou Qing, Efimov I.R. Spatiotemporal control of heart rate in a rabbit heart. *Journal of Electrocardiology*. 2011. V. 44. P.626.
59. Pavlov E.A., Osipov G.V., Chan C.K., Suykens J. A. K. Map-based model of the cardiac action potential. *Physics Letters A*, 2011, V. 375, P. 2894.
60. Grigoryeva S.A. and Osipov G.V. Optimum external impulse of low power for activation of one-dimensional dynamic al system. *Applied Nonlinear Dynamics*, 2012, V.18 P. 83 (in Russian).
61. Petrov V.S., Vildemanov A.V., Grigoryeva S.A., Kozinov E.A., Komarov M.A., Kostin V.A., Kryukov A.K., Levanova T.A., Meyerov I.B., Osipov G.V., Program complex 'Virtual heart'. *Vestnik of NNSU*, 2012, V.5(2), P. 438 (in Russian)
62. Komarov M.A., Osipov G.V., and Zhou Ch. Heteroclinic contour in oscillatory ensembles, *Physical Review E*, 2013,V.87, p.022909
63. Levanova T.A., Komarov M.A., Osipov G.V. Sequential activity and multistability in an ensemble of coupled Van der Pol oscillators. *European Physical Journal: Special Topics*, 2013, V. 222 (10), P. 2417
64. Balandin D.V., Komarov M.A., Osipov G.V. A motion control for a spherical robot with pendulum drive. *Journal of Computer and Systems Sciences International*, 2013, V.52 (4), P. 650.
65. Mikhaylov A.O., Komarov M.A., Levanova T.A., Osipov G.V. Sequential switching activity in ensembles of inhibitory coupled oscillators. *EPL*, 2103, V. 101 (2), P. 20009.
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67. Kryukov A.K., Petrov V.S., Osipov G.V. Multistability of synchronous regimes in rotator ensembles. *Problems of strength and plasticity*, 2014, V. 76(4), P. 364 (in Russian)

68. Petrov V. S., Osipov G. V. Interaction-based transition from passivity to excitability. *Physical Review E*, 2014, V. 90, P. 032916 .
69. Kostin V.A., Osipov G.V. Self-congruent electromechanical activity in the elastically fixed fiber of the heart tissue. *Problems of strength and plasticity*, 2014, V. 76(4), P.357 (in Russian)
70. Levanova T.A., Osipov G.V., Pikovsky A. Coherence properties of cycling chaos. *Communications in Nonlinear Science and Numerical Simulation*, 2014, V.19(8), P. 2734.
71. Smirnov L.A., Kryukov A.K., Kadina E.Yu., Gubina E.V., Osipov G.V. Rotation dynamics of the system of two coupled oscillators. *Problems of strength and plasticity*, 2015, V. 77(4), P. 425 (in Russian).
72. Belykh V.N., Bolotov M.I., Osipov G.V. Kuramoto phase model with inertia bifurcations leading to the loss of synchrony and to the emergence of chaos. *Modeling and Analysis of Information Systems*, 2015, V. 22 (5), P. 595.
73. Бастраков И.И., Гаврилова К.А., Григорьева С.А., Осипов Г.В. Подавление возбуждений в активной среде с помощью слабого внешнего воздействия. *Известия высших учебных заведений. Прикладная нелинейная динамика*. 2014. Т. 22. № 2. С. 62-76.
74. Kostin, V.A., Osipov, G.V. Transient and periodic spatiotemporal structures in a reaction-diffusion-mechanics system. *Chaos*, 2016, V. 26 (1), P. 013101
75. Kryukov, A.K., Petrov, V.S., Osipov, G.V., Kurths, J. Multistability of synchronous regimes in rotator ensembles. *Chaos*, 2015, V. 25 (12), P. 123121
76. Korotkov, A.G., Kazakov, A.O., Osipov, G.V. Sequential dynamics in the motif of excitatory coupled elements. *Regular and Chaotic Dynamics*, 2015, V. 20 (6), P. 701.
77. Lapyeva, T.V., Denisov, S.V., Osipov, G.V., Ivanchenko, M.V. Localization attractors in active quasiperiodic arrays. *JETP Letters*, 2015, V. 102 (9), P. 603.
78. Grines, E.A., Osipov, G.V. On constructing simple examples of three-dimensional flows with multiple heteroclinic cycles. *Regular and Chaotic Dynamics*, 2015, V. 20 (6), P. 679.
79. Maksimenko, V.A., Osipov, G.V., Makarov, V.V. Application of continuous wavelet transform to the analysis of structural variations in complex networks. *Technical Physics*, 2015, V. 60 (5), P. 785.
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81. Zhuravlev, M.O., Osipov, G.V., Sel'skii, A.O. Studying spatially distributed systems near the boundary of phase chaotic synchronization on various time scales of observation. *Technical Physics Letters*, 2015, V. 41 (2), P. 160.
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88. Kostin, V.A., Osipov, G.V. Excitation of spatiotemporal structures in elastic electroactive contractile fibers. *Doklady Mathematics*. 2016. V. 93 (1). P. 108.

### GRANTS AND SCIENTIFIC PROJECTS (IN RUSSIAN)

1. Грант РФФИ № 08-02-92004-ННС\_а, «Динамика и управление в сложных средах, состоящих из автоколебательных, возбудимых и пассивных элементов с приложением к кардиологии» 2008-2010, 0.73 млн. руб.
2. Грант РФФИ № 08-02-97049-р\_поволжье\_а, «Разработка принципов работы и создание лабораторного образца высокоэффективного слаборазрядного дефибриллятора», 2008-2010, 0.71 млн. руб.
3. Х/д с ЗАО «Интел А/О», «Применение INTEL Parallel Studio с дополнением INTEL Parallel Advisor Lite в разработке эффективных параллельных алгоритмов», 2009-2010, 0.036 млн. руб.
4. Х/д с ЗАО «Интел А/О», «Применение INTEL Parallel Studio 2011 XE Beta в разработке эффективных параллельных алгоритмов», 2010-2011, 0.075735 млн. руб
5. Х/д с ЗАО «Интел А/О», «Применение INTEL Parallel Studio 2011 XE в разработке эффективных параллельных алгоритмов», 2010-2011, 0.076382 млн. руб.
6. Грант РФФИ № 10-02-00940-а, «Синхронизация и управление в сложных сетях неидентичных осцилляторов со многими амплитудными и временными масштабами в приложении к нейродинамике», 2010-2012, 0.7 млн. руб.
7. Грант РФФИ № 11-02-92003-ННС\_а, «Пространственно-временное управление сложной динамикой с использованием обратной связи (с приложениями в кардиологии)», 2011-2013, 0.25 млн руб.
8. Грант РФФИ № 11-07-97013-р\_поволжье\_а, «Суперкомпьютерные системы и технологии в исследовании живых систем с приложениями в кардиологии», 2011-2012, 0.6 млн. руб.
9. Грант ФЦП «Исследования и разработки по приоритетным направлениям развития научно-технологического комплекса России на 2007-2013 годы» (госконтракт № 11.519.11.2015), «Компьютерные и in vitro исследования механоэлектрической активности сердца», 2011-2013, 7 млн. руб.
10. Грант ФЦП «Исследования и разработки по приоритетным направлениям развития научно-технологического комплекса России на 2007-2013 годы» (госконтракт № 11.519.11.2022), «In vitro и компьютерное исследование механизмов аритмий в сердце человека», 2011-2013, 5 млн. руб.
11. Грант ФЦП «Научные и научно-педагогические кадры инновационной России» на 2009-2013 годы (Соглашение № 14.В37.21.0247), «Хаотическая динамика», 2012, 2,4 млн.руб.
12. Внутренний грант ННГУ, программа 5\_100, меропр. 4.1.1. (НИР Н-475-99), «Динамика сложных систем: теория , моделирование, управление», 2014-2015, 5 млн. руб.



13. Внутренний грант ННГУ, программа 5\_100, меропр. 4.1.1. (НИР Н-495-99), «Суперкомпьютерное моделирование сердечной активности», 2014, 1 млн. руб.
14. Грант РФФИ № 14-12-00811 «Фазовая динамика осцилляторных сред», 2014-2016, 15 млн.руб.
15. Грант ФЦП ИР Соглашение № 14.575.21.0031, «Разработка системных компонентов инновационного роботизированного комплекса для реабилитации пациентов с нарушениями функций нижних конечностей вследствие травм и заболеваний головного и спинного мозга», 2014-2016, 26 млн. руб.
16. Комплексный проект по созданию высокотехнологичного производства в рамках Постановления 218, Договора № 02.G25.31.0157 от 01 декабря 2015 г. между ООО «НИАГАРА КОМПЬЮТЕРС» и МОН РФ и Договора №Д15-11/02 от 02 ноября 2015 года, между ННГУ им.Н.И.Лобачевского и ООО «НИАГАРА КОМПЬЮТЕРС», «Программно-аппаратный комплекс «Киберсердце» (Паккард)», 2016-2018 г, 170 млн. руб.