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Education

PhD in Mathematics & Physics 5/1984 Russian Academy of Sciences, Institute of Physics
of the Earth, Moscow, Russia

MS in Electrical Engineering 6/1975 Moscow Technical University, Moscow, Russia

Computer courses:

Active X/COM Programming Fundamentals 1998 Hands on technology transfer, Boston

Data Structure and Algorithm Analysis 1996 Wright State University, Dayton, OH

Database Management System, Pascal,

C, C++, VC++, UNIX 1994-96 Sinclair Community College, Dayton, OH

Professional Experience

2/2003-present Postdoctoral Researcher, Department of Biomedical Informatics, The Ohio
State University, Columbus, OH

5/1993-present Adjunct Faculty, Physics Department, Wright State University, Dayton, OH

1/2002-1/2003 Independent Software Consultant

3/2000-12/2001 Programmer Consultant, Lexis-Nexis, Dayton, OH

9/1996-2/2000 Programmer analyst, Renaissance Engineering, Inc, Dayton, OH

8/1995-10/1996 Contract Programmer analyst, Roytman Information Services, Dayton, OH

8/1980-2/1993 Russian Academy of Sciences, Institute of Physics of the Earth, Moscow

1988-93 Senior Researcher,

1983-88 Research Scientist,

1980-83 Assistant Research Scientist

9/1975-7/1980 Programmer Engineer, Moscow Technical University, Russia

Research Interests

Regulation of gene expression

Statistical analysis of core promoter elements in eukaryotes

Novel Downstream Core Element (DCE)

Synergy of core promoter elements

Computational approaches to identifying *cis*-regulatory elements

Novel technique for improvement of the Position-Weight Matrices (PWM) for the DNA/protein binding sites

Construction of new PWMs for the varies transcription factor binding sites (TFBS)

Analyze of TFBSs positional distribution in human genome

Combinatorial analysis of *sic*-regulatory elements

Transcriptional networks

Promoter mapping

Software development for scientific and educational purposes

Software package for statistical analysis of promoter databases (Promoter Classifier)

Software package for the genome analysis

Software package for PWM improvement

Nonlinear waves in DNA

Nonlinear equations (sine-Gordon equation)

Stochastic processes in ionosphere and laboratory plasma

Mechano-electromagnetic phenomena in solid materials

Tectono-electromagnetic phenomena

Seismo-electromagnetic waves

Magnetosphere-ionosphere current systems

Computer Information Sciences Skills

Visual C/C++, C#, Visual Basic, FORTRAN, Relational databases

Pending grants

- (1) 1 R21 DK075015-01: *microRNA Targets of CSF-1/RANKL Signaling Required for Osteoclast Differentiation* (PI Ostrovski M.), **project researcher.**
- (2) R01 GM074766-01: *Computer Prediction of Interacting Promoter Elements* (PI Ioshikhes I.P.), **project researcher.**

Grants

- (3) NATO-Russia Collaborative Linkage Grant Program JSTC.RCLG.978696 awarded 12.13.2001: *Investigation of seismo-electromagnetic emission in the radio-frequency range*, (PI Bambakidis, G), **project researcher**
- (4) NATO Collaborative Research Grant Program CRG 970028, awarded 4.1.1997: *Investigation of seismo-electromagnetic phenomena* (PI Wolf P.), **project researcher**
- (5) USSR Government grant: 1991-1992, *Influence of seismic vibration on oil deposits* (PI Nikolaevskiy V.N.), **project researcher**.
- (6) USSR Government grant: 1989-1990, *Investigation of modern prediction problems of hazard situations related to strong earthquakes*, **PI** of subsection *Electromagnetic method of earthquake prediction*.
- (7) USSR Government grant: 1989-1990, *Investigation of the possibility of protection of nuclear stations from earthquake by monitoring of electromagnetic field of earthquake focus*, **PI**.

Publications

- (1) Gershenzon, N.I., Stormo, G.D., and Ioshikhes, I.P. (2005) Computational technique for improvement of the Position-Weight Matrices for the DNA/protein binding sites. *Nucleic Acids Res.*, **33**(7) 2290-2301.
- (2) Gershenzon N.I., Ioshikhes I.P. (2005) Synergy of human Pol II core promoter elements revealed by statistical sequence analysis. *Bioinformatics*, **21**, 1295-1300.
- (3) Gershenzon, N.I. and Ioshikhes, I.P. (2005) Promoter Classifier: software package for promoter database analysis. *Appl. Bioinformatics*, **4**(2) (in press). (http://bmi.osu.edu/~ilya/promoter_classifier/).
- (4) Lee, D.H., Gershenzon, N.I., Gupta, M., Ioshikhes, I.P., Reinberg, D., and Lewis, B.A. (2005) Functional Characterization of Core Promoter Elements: The DCE Is Recognized by TAF1. *Molecular & Cellular Biology*, (in press).
- (5) Gershenzon N.I., Middha S., Ioshikhes I.P. (2005) The features of *Drosophila* core promoters revealed by statistical analysis (in preparation).
- (6) Wagner, W. and Gershenzon, N.I. (2002) Physics 202: General Physics Laboratories - Electricity and Magnetism; User's guide, *Wright State University*. 173 pages.
- (7) Gershenzon, N. and G. Bambakidis, (2001) Modeling of seismo-electromagnetic phenomena. *Russian Journal of Earth Sciences*, **3**(4), 247-275.

- (8) Wolfe, P.J., J. Yu, and N.I. Gershenzon, (1996) Seismoelectric studies in an outwash plain, *Proc.Symp. on the Appl. of Geophys. to Eng. and Env. Problems*, Wheat Ridge, Col., 21-30.
- (9) Gershenzon, N.I. (1994) Interaction of a Group of Dislocations within the Framework of the Continuum Frenkel-Kontorova Model. *Physical Review B*, **50**, 13308-13314.
- (10) Gershenzon, N.I. and M.B. Gokhberg, (1994) On the Origin of ULF Magnetic Disturbances Prior to the Loma Prieta Earthquake. *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth*, **2**, 19-24.
- (11) Gershenzon, N.I., M.B. Gokhberg, and A.V. Gugl'elmy (1993) Electromagnetic Field of Seismic Impulse. *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth (Fizika Zemli)* **9**, 48-52.
- (12) Gershenzon, N.I., M.B. Gokhberg, and S.L. Yunga (1993) On the Electromagnetic Field of an Earthquake Focus. *Physics of the Earth and Planetary Interiors*, **77**, 13-19.
- (13) Gershenzon, N.I. and M.B. Gokhberg (1993) On Origin of the Electrotelluric Field Disturbances Prior to an Earthquake in Kalamata, Greece. *Tectonophysics*, **224**, 169-174.
- (14) Gershenzon, N.I. (1993) Mechanisms of influence of electric field on processes of oil segregation. *Book "Influence of seismic vibration on oil deposits"*. Moscow, 56-65.
- (15) Gershenzon N.I. (1992) Seismoelectromagnetic Field of Electrokinetic Nature. *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth*, **7**, 51-61.
- (16) Gershenzon, N.I. (1992) About E.M. Strelkov's article "Estimation of Magnetic Field of Seismoelectric Currents". *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth*, **3**, 111-112.
- (17) Gershenzon, N.I. and M.B. Gokhberg (1992) On the Origin of Electrotelluric Disturbances Prior to Earthquake. *Proceeding on the International School of Solid Earth Geophysics 5th course: Earthquake Prediction, Erice, Italy July 16-23, 1989*, 515-525.
- (18) Gershenzon, N.I. and M.B. Gokhberg (1992) Electromagnetic Prediction of Tsunami. *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth*. **2**, 39-43.
- (19) Gershenzon, N.I. and M.B. Gokhberg (1992) On Earthquake Precursors in Geomagnetic Field Variations of Electrokinetic Nature. *Izvestiya Russia Akademii Nauk, Physics of the Solid Earth*. **9**, 100-105.
- (20) Biadzhi, P.F., N.I. Gershenzon, D.O. Zilpimiani, P.V. Mandzhgaladze, O.A. Pokhotelov, V. Sgrin'ya, and Z.T. Chelidze (1990) Influence of a Magnetic Field on Mechanical

- Properties of Ionic Crystals During their Deformation. *Soviet Physics, Solid State*, **32**(8), 1352-1354.
- (21) Gershenzon N.I., M.B. Gokhberg, Yu. P. Kurchashov, E.B. Chirkov, V.I. Chernyi. A.V. Drumya, and M. M. Bogorodsky, (1990) On the Generation of Electrotelluric Fields by Crustal Geodynamic Processes. *Proceeding of International Wroclaw Symposium on Electromagnetic Compatibility 06.26-29*, **2**, 877-881.
- (22) Dobrovolsky, I.P., N.I. Gershenzon, and M.B. Gokhberg (1989) Theory of Electrokinetic Effects Occurring at the Final Stage in the Preparation of a Tectonic Earthquake. *Physics of the Earth and Planetary Interiors*, **57**, 144-156.
- (23) Gershenzon, N.I., M.B. Gokhberg, A.V. Karakin, N.V. Petviashvili, and A.L. Rykunov (1989) Modeling the Connection Between Earthquake Preparation Processes and Crustal Electromagnetic Emission. *Physics of the Earth and Planetary Interiors*, **57**, 129-138.
- (24) Grigoryev, A.I., N.I. Gershenzon, and M.B. Gokhberg (1989) Parametric Instability of Water Drops in an Electric Field as a Possible Mechanism for Luminous Phenomena Accompanying Earthquakes. *Physics of the Earth and Planetary Interiors*, **57**, 139-143.
- (25) Gershenzon, N.I., M.B. Gokhberg, and I.P. Dobrovolsky (1989) Computation of Short-Range Earthquake Precursors in Electrotelluric Field. *Izvestiya Akademii Nauk SSSR, Physics of the Solid Earth*, **25**(11), 901-912.
- (26) Gershenzon, N.I and M.B. Gokhberg (1989) On the Origin of Electrotelluric Disturbances Prior to Earthquake. *Proceeding of Symposium on Electromagnetic Compatibility, Nagoya, Japan, September 8-10* **vol.1**, 116-122.
- (27) Gurevich, A.V., N.I. Gershenzon, A.L. Krylov, and N.G. Mazur (1989) Solutions of the sine-Gordon Equation by the Modulated-Wave Method and Application to a Two-State Medium. *Soviet Physics, Doklady*. **34**(3), 246-248.
- (28) Gershenzon, N.I., D.O. Zilpimiani, P.V. Mandzhgaladze, and O.A. Pokhotelov (1988) Enhancement of the Mechanical Strength of LiF Single Crystals in a Static Magnetic Field. *Soviet Physics, Solid State*, **30**(7), 1273-1274.
- (29) Grigoryev, A.I., N.I. Gershenzon, and M.B. Gokhberg (1988) On Origin of the Atmosphere Light During Earthquakes. *Doklady Akademii Nauk SSSR*. **300**(5), 1087-1090.
- (30) Gershenzon, N.I., D.O. Zilpimiani, P.V. Mandzhgaladze, and O.A. Pokhotelov (1987) Influence of Ultraviolet Radiation on Formation of Cracks in Ionic Crystals. *Soviet Physics, Solid State* **29**(2), 332-333.

- (31) Gershenzon N.I., M.B. Gokhberg, V.A. Morgunov, and V.N. Nikolaevskiy (1987) Sources of Electromagnetic Emissions Preceding Seismic Events. *Izvestiya Akademii Nauk SSSR, Physics of the Solid Earth*, **23**(2), 96-101.
- (32) Gershenzon, N.I., A.L. Krylov and N.G. Masur (1986) Amplification of Longitudinal Waves during Interaction of Bunch with Chaotic-Inhomogeneous Plasma. *Fizika Plazmy*. **12**(5), 1069-1073.
- (33) Al'perovich, L.S., N.I. Gershenzon, and A.L. Krylov (1986) Fluctuations of Quasi-stationary Electric and Magnetic Fields Caused by Random Inhomogeneities of Wind Motions in the Ionosphere. *Geomagnetism and Aeronomy*, **26**(3), 335-339.
- (34) Al'perovich, L.S., N.I. Gershenzon, and A.L. Krylov (1986) Fluctuations of Quasistationary Electric and Magnetic Fields Caused by Random Inhomogeneities of Ionospheric Conductivity, *Geomagnetism and Aeronomy*, **26**(6), 787-789.
- (35) Al'perovich, L.S., N.I. Gershenzon, and A.L. Krylov (1986) The Relation Between the Spatial and Temporal Spectra of Ionosphere Wave Disturbances. *Geomagnetism and Aeronomy*, **26**(6), 863-865.
- (36) Belen'kaya, B.N., N.I. Gershenzon, M.B. Gokhberg, and L.A. Dremukhina (1986) Inhomogeneity in the Field of Geomagnetic Variations of the Magnetosphere-Ionosphere Current Systems in Middle latitudes. *Izvestiya Akademii Nauk SSSR, Physics of the Solid Earth*, **22**(8), 665-669.
- (37) Gershenzon, N.I., D.O. Zilpimiani, P.V. Mandzhgaladze, O.A. Pokhotelov, and Z.T. Chelidze (1986). Electromagnetic Emission of the Crack Top during Rupture of Ionic Crystals. *Doklady Akademii Nauk SSSR*, **288**(1), 75-78.
- (38) Gershenzon, N.I., D.O. Zilpimiani, P.V. Mandzhgaladze, and O.A. Pokhotelov (1986) Effect of a Magnetic Field on the Fracture of LiF Single Crystals. *Soviet Physics, Solid State* **28**(3), 394-396.
- (39) Gershenzon N.I., M.B. Gokhberg, and V.A. Morgunov (1987) Sources of Electromagnetic Emissions prior Seismic Events. *Earthquake prediction. Donish. Dushanbe, USSR*, **7**, 54-62.
- (40) Gokhberg, M.B., I.L. Gufel'd, N.I. Gershenzon, and V.A. Pilipenko (1985) Electromagnetic Effects During Rupture of the Earth's Crust. *Izvestiya Akademii Nauk SSSR, Physics of the Solid Earth*, **21**(1), 52-63.
- (41) Gokhberg, M.B., N.I. Gershenzon, I.L. Gufel'd, A.V. Kustov, V.A. Liperovskiy, and S.S. Khusameddinov (1984) Possible Effects of the Action of Electric Fields of Seismic Origin on the Ionosphere. *Geomagnetism and Aeronomy*, **24**(2), 183-186.

- (42) Gershenzon, N.I. and M.B. Gokhberg (1984) A Technique for Isolating the Effects of Variations of the Geomagnetic Field Associated with Seismicity. *Geomagnetism and Aeronomy*, **24**(1), 79-82.
- (43) Gershenzon, N.I. (1983) Reconstruction of the Ring-Current Characteristics from the Ground-Level Variations in the Geomagnetic Field. *Geomagnetism and Aeronomy*, **23**(1), 67-70.
- (44) Gershenzon, N.I. (1983) Electric Currents and Magnetic Fields of the Plasma Inhomogeneity Located in the Inner Magnetosphere. *Geomagnetism and Aeronomy*, **23**(2), 206-210.
- (45) Larkina, V.I., A.V. Nalivayko, N.I. Gershenzon, M.B. Gokhberg, V.A. Liperovskiy, and S.L. Shalimov (1983) Observations of VLF Emission, Related with Seismic Activity, on the Interkosmos-19 Satellite. *Geomagnetism and Aeronomy*, **23**(5), 684-687.
- (46) Gershenzon, N.I. and A.I. Krylov (1982) Reconstruction of the Three-Dimensional Current System from Variation in the Ground-Level Magnetic Field for Sloping Lines of Force. *Geomagnetism and Aeronomy*, **22**(3), 384-387.
- (47) Afonina, R.G., B.A. Belov, V.Yu. Gaydukov, N.I. Gershenzon, A.E. Levitin, D.S. Faermark, and Yu.I. Fel'dstein (1982) Space-Time Distribution of the Longitudinal Currents in the High-Altitude Daytime Sector for Various Conditions in the Interplanetary Magnetic Field. *Geomagnetism and Aeronomy*, **22**(3), 433- 435.
- (48) Afonina, R.G., B.A. Belov, V.YU. Gaydukov, N.I. Gershenzon, A.E. Levitin, D.S. Faermark, and Ya.I. Fel'dstein. (1982) Model for the Electric Field at the Morning-Evening Meridian in the Northern Polar Cap. *Geomagnetism and Aeronomy*, **22**(3), 436-438.
- (49) Al'perovich, L.S. and N.I. Gershenzon (1981) Periodic Structures in the Polar Ionosphere and Geomagnetic Pulsations. *Geomagnetism and Aeronomy*, **21**(2), 192-195.
- (50) Gershenzon, N.I. (1981) Effect of Altitude-Dependent Inhomogeneity of the Ionospheric Conductivity Tensor on Longitudinal Currents. *Geomagnetism and Aeronomy*, **21**(5), 626-628.

Patents

- (1) Certificate #1603328 (1990) N.I. Gershenzon, M.B. Gokhberg, and I.P. Dobrovolsky. Method of the Geodynamic Processes Investigation. *USSR Government comity of discoveries*.

- (2) Certificate #1599822 (1990) N.I. Gershenzon, M.B. Gokhberg, and I.P. Dobrovolsky. Method of the Electrotelluric Field Measurement during Investigation of the geodynamic processes. *USSR Government comity of discoveries*.

Scientific reports and unpublished papers

- (1) Gershenzon N.I. (1996) Friction in the framework of the Frenkel-Kontorova model. 10 pages (article).
- (2) Gershenzon N.I. (1994) A model of crust movement along transform faults. 18 pages (article).
- (3) Gershenzon, N.I. (1991) Electromagnetic methods of earthquake prediction. *Institute of Physics of the Earth*. Moscow. 40 pages (scientific report).
- (4) Gershenzon N.I. (1990) Investigation of the possibility of protection of nuclear stations from earthquake by monitoring of electromagnetic field of earthquake focus. *Institute of Physics of the Earth*. Moscow. 62 pages (scientific report).

Conference Presentations (partial list)

- (1) Gershenzon, N.I., Ostrowski, M.C., Ioshikhes, I.P., and Stormo, G.D. (2005) Computational technique for improvement of the Position-Weight Matrices for the DNA/protein binding sites (ETS factor as study case). *System Biology: Global regulation of gene expression*, Cold Spring Harbor NY, March 17-20, p.98.
- (2) Gershenzon, N.I., and Ioshikhes, I.P. (2004) Development of the position-weight matrix technique for DNA/protein binding sites. *Systems Biology: Genomic Approaches to Transcriptional Regulation meeting*, Poster (Abstract 48). Cold Spring Harbor NY, Mar 4-7.
- (3) Gershenzon, N.I. and Ioshikhes, I.P. (2004) Synergy of human core promoter elements revealed by statistical sequence analysis. *Systems Biology: Genomic Approaches to Transcriptional Regulation meeting*, Poster (Abstract 47). Cold Spring Harbor NY, Mar 4-7.
- (4) Gershenzon, N.I. and Ioshikhes, I.P. (2003) Statistics of core promoter elements in human genes. *6th Annual Conference on Computational Genomics*, Poster PS-12 Cambridge MA, Oct 8-11.
- (5) Gershenzon, N.I. and Gokhberg, M.B. (1992) Analysis of mechanisms responsible for tectonoelectro-telluric variation. *International Workshop Low frequency electrical precursors: fact or fiction?* Lake Arrowhead, California, June 14 – 17.

- (6) Gershenzon, N.I. and Gokhberg, M.B. (1991) On Electromagnetic field of earthquake focal. *XX General Assembly IUGG Vienna, Austria, August 11-24 1991*.
- (7) Gershenzon, N.I. and A.I. Krylov (1981) Reconstruction of the Ring-Current Characteristics from the Ground-Level Variations in the Geomagnetic Field. *Symposium "International Investigation of Magnetosphere"*. Ashabad, USSR, 16-17.
- (8) Al'perovich, L.S. and N.I. Gershenzon (1981) Heating Structures in the Polar Ionosphere and Geomagnetic Variations. *Symposium "International Investigation of Magnetosphere"*. Ashabad, USSR, 33-34. 42.

Software packages

- (1) Promoter Classifier: software package for promoter database analysis.
(http://bmi.osu.edu/~ilya/promoter_classifier/).
- (2) Physics 202: General Physics Laboratories: Electricity and Magnetism
(<http://www.wright.edu/~naum.gershenzon/VLE.html>)