

## **Larry S. Liebovitch, Ph.D.**

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Professor, Department of Physics  
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### **1968-1972 City College, City University of New York**

B.S. summa cum laude, Physics, 1972

### **1972-1978 Harvard University, Department of Astronomy, Cambridge, MA**

A.M. Astronomy, 1973

Ph.D Astronomy, 1978

Thesis: Two dimensional calculation of gas flow in barred spiral galaxies.

Teaching Fellow - Harvard University

Instructor - Cambridge Center for Adult Education

Research Assistant - M.I.T.

### **1978-1979 Mt. Sinai School of Medicine, City University of New York**

Department of Ophthalmology

N.I.H. Postdoctoral Fellow

### **College of Physicians & Surgeons of Columbia University, NY**

Department of Ophthalmology

1979-1982 N.I.H. Postdoctoral Fellow

1982-1985 Associate Research Scientist

1985-1993 Assistant Professor

**Florida Atlantic University, Boca Raton, FL**

Center for Complex Systems and Brain Sciences

Center for Molecular Biology and Biotechnology

Department of Psychology

Department of Biomedical Science

1993-1998 Associate Professor

tenured: August 1996

1998-2010 Professor

2004-2007 Interim Director, Center for Complex Systems and Brain Sciences

2007-2008 Graduate Programs Director, Charles E. Schmidt College of Science

2008-2010 Associate Dean for Graduate Studies and Programs, Charles E. Schmidt College of Science

**PROFESSIONAL HONORS AND POSITIONS**

Member of the Editorial Board of the *American Journal of Physiology*, Modeling in Physiology Section, 1991-1996

Chair of the Biophysics Section of the New York Academy of Sciences, 1991-1992

Fellow of the American Physical Society through the Division of Biological Physics, 1995

"For advancing the physics of fractals and chaos and using these methods to analyze and understand biological systems."

Zbigniew Czernicki, Larry Liebovitch, and Włodzimierz Klonowski: Editors-in-Chief of the new on-line journal *Nonlinear Biomedical Physics* published by Biomed Central  
<http://www.nonlinearbiomedphys.com/>

**Grants:**

Principal Investigator:

NIH EY4624 Measurement of Human Corneal Endothelial Fluid Flows 1983-86

Whitaker Foundation: Fractals in Biomedical Signal Processing 1987-90

American Heart Association: Established Investigatorship 1988-93

NIH EY6234 Ion Current Analysis in the Cornea 1986-89

NIH EY6234 Ion Current Analysis in the Cornea (Renewal) 1989-94

NIH EY6234 Ion Current Analysis in the Cornea (Renewal) 1994-99

NSF DUE-9752226 Interactive Fractal and Chaos Units 1998-99

NSF DUE-9980715 Integrated Electronic Curricula Material in Fractals and Chaos 2000-2003

NIH GM63527-01 subcontract, Nonlinear Dynamics of Intracellular Signaling 2001-5

McGuire Foundation Nonlinear Analysis of Cardiac Patient Data 2001-2.

U.S.Navy-ASEE Summer Faculty Research Program with Ira Schwartz, Naval Research Laboratory, Washington, DC 2002.

U.S.Navy-ONR-ASEE Summer Faculty Research Program with Ira Schwartz, Naval Research Laboratory, Washington, DC 2003.

U.S.Navy-ONR-ASEE Summer Faculty Research Program with Ira Schwartz, Naval Research Laboratory, Washington, DC 2004.

Participant:

James S. McDonnell Foundation: Intractable Conflict as a Dynamical System, P.I. Peter T. Coleman, Columbia University 2006-2009.

**Fellowships:**

International Center for Transdisciplinary Studies, International University of Bremen, Germany, 2006.

**Member of the following professional societies: (\*=currently active)**

American Association for the Advancement of Science\*

American Association for Artificial Intelligence

American Astronomical Society\*

American Physical Society\*

Association for Psychological Science\*

Association for Research in Vision and Ophthalmology

Basic Science Council of the American Heart Association\*

Biophysical Society

International Chemometrics Society

International Neural Network Society

International Society for Eye Research

Mathematical Association of America\*

New York Academy of Sciences

Sigma Xi\*

Society for Chaos Theory in Psychology and Life Sciences\*

Society for Personality and Social Psychology\*

**Reviewer of grant proposals for the following agencies and foundations:**

AIBS Bioelectromagnetics Review Group for the Office of Naval Research

Canadian Cystic Fibrosis Foundation

Department of Energy

Department of the Army

Thomas F. and Kate Miller Jeffress Memorial Trust

Fonds zur Förderung der wissenschaftlichen Forschung (Austrian Science Foundation)

Marsden Fund (Royal Society of New Zealand)

Medical Research Council of Canada

National Institutes of Health

ad hoc reviewer

Study Section: VISA special Emphasis

Study Section: VISA-ZRG(1)

National Science Foundation

ad hoc reviewer

Div. Undergraduate Ed., Course Curriculum, and Lab. Improvement Program Panel  
Human and Social Dynamics (HSD) Program

Natural Sciences and Engineering Research Council of Canada

Northwest Health Foundation

Research Corporation, Tucson AZ

Whitaker Foundation

**Reviewer of articles submitted to the following Journals:**

Advances in Complex Systems

American Journal of Physiology

Animal Behavior

Annals of Biomedical Engineering

Biochemica et Biophysica Acta

Bioelectrochemistry and Bioenergetics

Bioinformatics

Biological Cybernetics

Biophysical Chemistry

Biophysical Journal

Bioscience Reports

Biosensors and Bioelectronics

Biosystems

Biotechnology Progress

Bulletin of Mathematical Biology

BMC Systems Biology

Canadian Journal of Physiology and Pharmacology

Cell Biochemistry and Function

Cellular and Molecular Biology Letters

Chaos

The CLAO (Contact Lens Association of Ophthalmologists) Journal

Complex Systems

Croatica Chemica Acta

Current Eye Research

Fractals

Experimental Eye Research

European Biophysics Journal

Europhysics Letters

IEEE Transactions on Biomedical Engineering

Integrative and Comparative Biology

Investigative Ophthalmology and Visual Science

Journal of Biological Physics

Journal of Biomedical Science

Journal of the Electrochemical Society

Journal of General Physiology

Journal of Membrane Biology

Journal of Neurophysiology

Journal of Neuroscience Methods

Journal of Pediatric Gastroenterology and Nutrition

Journal of Physical Chemistry

Journal of the Royal Society - Interface

Journal of Statistical Physics

Journal of Theoretical Biology

Journal of Thermal Analysis

Langmuir

Mathematical Biosciences

Molecular Psychiatry

Neuroscience Letters

Nonlinear Dynamics, Psychology, and Life Sciences

Pediatric Research

Perception

Physica A

Physica D

Physical Review E

Physical Review Letters

Physics Letters

Plant Biology

Proceedings of the National Academy of Sciences (USA)

Proceedings of the Royal Society (London)

Social Cognition

Transactions on Biomedical Engineering

**Invited presentations at scientific meetings:**

1983

4th International Conference on Physicochemical Hydrodynamics, New York, NY

1987

IEEE Engineering in Medicine and Biology Society, Boston, MA

13th IEEE Annual Northeast Bioengineering Conference, Philadelphia, PA

Workshop on Advanced Methods of Physiological System Modeling, Los Angeles, CA

1988

Gordon Research Conference on Theoretical Biology and Biomathematics, Tilton, NH

Gordon Research Conference on Bioelectrochemistry, Plymouth, NH Workshop on Advanced Methods of Physiological System Modeling, Los Angeles, CA

World Congress on Medical Physics and Biomedical Engineering, San Antonio, TX

1989

American Physical Society - Symposium on Nonlinear Dynamics in Living Systems, St. Louis, MO

New York Academy of Sciences - Mathematical Approaches to Cardiac Arrhythmias, New York, NY

1990

9th International Congress of Eye Research, Helsinki, Finland

NATO Advanced Workshop on Complex Dynamics and Biological Evolution, Hindsø, Denmark

1991

2nd Finnish Nonlinear Days, Jyväskylä, Finland

Federation of the Societies of Experimental Biology of Brazil, Brazilian Congress of Biophysics, Symposium on the Functional and Structural Properties of Macromolecules of Cell Membranes, Caxambu, Brazil

Stony Brook Biomathematics Conference, Stony Brook, NY

Contractors Meeting of the Membrane Electrochemistry Program of the Office of Naval Research, Airlie, VA

Annual Fall Meeting of the Biomedical Engineering Society, Charlottesville, VA

American Heart Association, Research Fellowship Symposium, Anaheim, CA

Society for Neuroscience, Symposium on the Dynamical Behavior of Neural Systems, New Orleans, LA

1992

Radiation Research Society, Plenary Lecture: An Introduction to Chaos and Its Application to Biology, Salt Lake City, UT

NATO Advanced Workshop on Stochastic Resonance in Physics and Biology

San Diego, CA



The Head and Heart of Chaos: NIH Workshop on Nonlinear Dynamics in Biological Systems, NIH  
Bethesda, MD

IEEE Engineering in Medicine and Biology Society, Tutorial: Introduction to Fractals in Biology, Paris,  
France

1993

Hofstra University Biomathematics and Bioengineering Conference, Hempstead, NY

19th IEEE Annual Northeast Bioengineering Conference: Minisymposium on Fractals and Chaos, Newark,  
NJ

17th Annual Cell Kinetics Society Meeting, Richland, WA

Biophysics of Membrane Transport: Symposium in Memory of Peter Läuger, Konstanz, Germany

1994

American Physical Society: Fractals in Biological Physics, Symposium of the Division of Biological  
Physics, Pittsburgh, PA

North American Society for the Psychology of Sport and Physical Activity, Preconference Workshop on  
Complex Systems, Clearwater, FL

XVII Congress of the International Society for Analytical Cytology, Frontiers in Science Lecture, Lake  
Placid, NY

IEEE Engineering in Medicine and Biology Society Workshop on Chaotic Questions: From Theory to  
Bedside Applications, Baltimore, MD

Dynamical Neuroscience Workshop, Satellite Symposium of the 24th Annual Meeting of the Society for  
Neuroscience, Boca Raton, FL

Artificial Neural Networks in Engineering, Tutorial on Chaos and Fractals, St. Louis, MO

1995

Biophysical Society, Workshop in Molecular Biophysics, San Francisco, CA

American Physical Society: Applications of Artificial Neural Networks and Other Artificial Intelligence  
Procedures to Chemical Systems, Symposium of the Division of Chemical Physics, San Jose, CA

Association for Research in Vision and Ophthalmology, Special Interest Group Meeting - Fractals in  
Ophthalmology: A New Tool for Basic Science and Clinical Diagnosis, Ft. Lauderdale, FL.

Tumor Heterogeneity Workshop, Kananaskis, Alberta, Canada

Workshop on the Role and Control of Random Events in Biological Systems, Sigtuna, Sweden

Flow Cytometry Consensus Meeting of the HIV/AIDS Clinical Trials Network of Canada, Aylmer, Québec, Canada

1996

44th Annual Meeting of the Radiation Research Society, Symposium on New Concepts in Tumor Biology/Physiology, Chicago, IL

Polish-British Workshop on Fractals, Nonlinear Dynamics and Chaos, Zakopane, Poland

1997

13th School on Biophysics of Membrane Transport, Ladek Zdroj, Poland

4-lecture Tutorial at the Polish-Anglosaxon-Italian Forum on Nonlinear Biophysics, Ladek Zdroj, Poland

1998

American Physical Society: Long-range Correlated Fluctuations in Biological Systems, Symposium of the Division of Biological Physics, Los Angeles, CA

Association for Research in Vision and Ophthalmology, Special Interest Group Meeting - Morphology and Differentiation in the Transparent Lens, Ft. Lauderdale, FL.

1999

Membrane Transport and Renal Physiology Workshop, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN

Keynote speaker: Mathematics Awareness Day, Rhode Island College, Providence, RI

Facets of Universality in Complex Systems: Climate, Biodynamics and Stock Market, Schloss Rauischholzhausen, Germany

12th Marian Smoluchowski Symposium on Statistical Physics, Zakopane, Poland

Complexity Research and Biotechnology in Agriculture and Medicine, Bozeman, MT.

University of Minnesota Institute for Mathematics and its Applications Hot Topics Workshop: Scaling Phenomena in Communications Networks, Minneapolis, MN.

VHA Third Annual Conference on Complexity Science and Health Care, Philadelphia, PA.

Dr. Charles Sing, Genetics Conference, Ann Arbor, MI.

2000

MAA Mathematics Curriculum for Health and Life Sciences Students Conference, Virginia Commonwealth University, Richmond, VA.

VHA Complexity Leadership and Learning Network Session, Short Hills, NJ.

Society for Chaos Theory in Psychology and Life Sciences: Physiology Workshop: Nonlinear Dynamics in Health and Disease by Susan Mirow and Larry Liebovitch, Philadelphia, PA.

Modeling and Analysis of Genome-Quantitative Phenotype Relationships, Ann Arbor, MI.

Atelier sur les fractales et modelisation en analyse structurale et dynamique (Workshop on Fractal Modeling in Structural and Dynamical Analysis"), Montreal, Quebec, Canada.

2001

AMATYC (American Mathematics Association of Two Year Colleges), New Visions in Mathematics Education: A Poster Session Featuring Grants Funded by the National Science Foundation, Toronto, Canada.

2002

BioFlorida, Boca Raton, FL.

Workshop on Biotechnology and Complexity in Agriculture and Medicine, Bozeman MT.

2003

Joint Mathematics Meeting, MAA (Mathematical Association of America) Session on Projects Supported by the NSF Division of Undergraduate Education, Baltimore, MD.

Biomathematics Workshop and Summer School, Instituto de Matematica Pure e Aplicada (Institute for Pure and Applied Mathematics), Rio de Janeiro, Brazil.

Uncertainty and Surprise: Questions on Working with the Unexpected and Unknowable, The Plexus Institute and the Red McCombs School of Business, University of Texas, Austin TX.

Workshop: Nonlinear Methods in Psychology, George Mason University, Fairfax, VA.

2003 Allen Cognitive Network Symposium, Tampa, FL.

2004

St. Olaf College's Fifth Annual Science Symposium, "The Strange Attraction of Chaos: Advances in Understanding Complex Systems" St. Olaf College, Northfield, MN.

Society for Chaos Theory in Psychology and Life Science - Tutorial: Introduction to Fractals and Chaos, Milwaukee, WI.

Workshop on Complexity Science and Healthcare Quality: Crafting an International Research Agenda, Harvard Interfaculty Program for Health Systems Improvement and the Plexus Institute, Durham, NH.

2006

BioQUEST Summer Workshop 2006, Beloit, WI.

Society for Chaos Theory in Psychology and Life Science - Tutorial: Introduction to Fractals and Chaos, Baltimore, MD.

2007

Wilhelm and Else Heraeus Summer School, Statistical Physics of Gene Regulation - From Networks to Expression Data and Back, Jacobs University, Bremen, Germany.

Global Futures Form on Genocide Prevention: Complexity Theory and Genocide Prevention, October 18-19, 2007, Washington DC.

2008

Society for Chaos Theory in Psychology and Life Science - Tutorial: Introduction to Fractals and Chaos, Richmond VA.

**Sessions organized at scientific meetings:**

1991

Workshop on Physical and Mathematical Theories of Ion Channel Gating at the 35th Annual Meeting of the Biophysical Society, San Francisco, CA

Fractals and Mathematical Models at the 17th Annual Northeast Bioengineering Conference, Hartford, CT

1995

Fractals in Molecular Biophysics at the 39th Annual Meeting of the Biophysical Society, San Francisco, CA

Special Interest Group Meeting, Fractals in Ophthalmology: A New Tool for Basic Science and Clinical Diagnosis at the 1995 Annual Meeting of the Association for Research in Vision and Ophthalmology, Ft. Lauderdale, FL

1998

Tutorial: Additional Instructor in Fractal Biology and Chaos in Medicine, March Meeting of the American Physical Society, Los Angeles, CA

2003

Workshop: Introduction to Fractals and Chaos, Society for Chaos Theory in Psychology and Life Sciences, Boston, MA

**Scientific meetings organized:**

2003

Program Committee, International Nonlinear Sciences Conference: Research and Applications in the Life Sciences, Vienna, Austria.

2005

FAU Center for Complex Systems and Brain Sciences - Plexus Institute Conference: On the Verge: Changing Lives, Organizations and MindsL Complexity Science in a Changing World, Boca Raton and Delray Beach Florida.

2006

Programme Committee, Fractal 2006, Vienna, Austria.

**Invited seminars at universities, research institutes, and corporations:**

1986

CUNY Mt. Sinai School of Medicine, NY (Dept. of Physiology and Biophysics)

1987

Albert Einstein College of Medicine (Dept. of Physiology and Biophysics)

The City College of New York (Sigma Chi Lecture)

Columbia University (Dept. of Applied Mathematics, Dept. of Ophthalmology,  
Dept. of Physiology and Biophysics)

Cornell University Medical College (Dept. of Physiology and Biophysics)

New York University (Courant Institute)

Syracuse University (Depts. of Physics and Biophysics)

University of Maryland (Dept. of Physiology)

University of Rhode Island (Dept. of Electrical Engineering)

Weizmann Institute (Dept. of Applied Mathematics)

1988

Columbia University (Dept. of Ophthalmology)

University of Connecticut Health Sciences (Dept. of Pharmacology) University of Washington (Dept. of Bioengineering)

1989

Boston University School of Medicine (Dept. of Physiology)

State University of New York at Stony Brook (Dept. of Applied Mathematics & State University of New York at Stony Brook (Dept. of Applied Mathematics & Statistics)

University of Illinois at Urbana (Dept. of Physics)

Washington University (Jewish Hospital)

1990

Columbia University (Dept. of Ophthalmology)

FDA (Center for Devices and Radiological Health)

Johns Hopkins University School of Medicine (Dept. of Bioengineering)

University of Alberta (Dept. of Physiology)

University of Pennsylvania (Dept. of Physiology)

1991

Cornell University Medical College (Dept. of Pharmacology)

CUNY Mt. Sinai School of Medicine, NY (Dept. of Biomathematical Sciences)

University of Southern California (Dept. of Biomedical Engineering)

University of Oulu Finland (Dept. of Physiology)

Columbia University (Dept. of Developmental Psychobiology)

City College of New York (Dept. of Biology)

The Rockefeller University (Biophysics Laboratory)

Boston University School of Medicine (Dept. of Physiology)

SUNY Health Sciences at Syracuse (Dept. of Physiology)

Syracuse University (Dept. of Physics)

Cornell University (Dept. of Pharmacology, Biophysics Seminar)

Federal University in Rio de Janeiro (Institute of Biophysics)

Brazilian Center for Research in Physics (Dept. of Condensed Matter and Spectroscopy)

Geisinger Medical Center (Weis Center for Research)

Columbia University (Dept. of Ophthalmology)

1992

Emory University (Dept. of Physics)

The City College of New York (Biomechanics Seminar Series)

Princeton University (Dept. of Physics)

University of Utah (Dept. of Applied Mathematics)

University of Washington (Dept. of Bioengineering)

University of California at Santa Cruz (Dept. of Chemistry)

The City College of New York (Levich Institute for Physico-Chemical Hydrodynamics)

University of Chicago (Depts. of Cardiology and Neurology)

National Institutes of Health (National Eye Institute)

Boston University (Dept. of Bioengineering)

1993

Rutgers University, Newark (Frontiers in Biomedical Science)

University of Washington (Dept. of Bioengineering)

Florida Atlantic University (Center for Complex Systems)

CUNY Mt. Sinai School of Medicine, NY (Dept. of Biomathematical Sciences)

University of Helsinki (Institute of Physics)

1994

Florida Atlantic University (Dept. of Biology)

New Jersey Institute of Technology (Dept. of Bioengineering)

Columbia University (Comprehensive Cancer Center)

Yale University (Dept. of Cellular and Molecular Physiology)

Carnegie Mellon University (Dept. of Physics)

Columbia University (Dept. of Medical Informatics)

Coulter Corporation (Miami, FL)

Boca Raton Members of the New York Academy of Sciences

1995

Columbia University (Dept. of Ophthalmology)

Columbia University (Biophysics Seminar Series)

University of Alberta, Edmonton, Alberta, Canada (Dept. of Physiology)

Florida International University (Dept. of Physics)

Florida Atlantic University (Dept. of Physics)

1996

Polish Academy of Sciences, Warsaw (Institute of Theoretical Physics)

Columbia University (Dept. of Ophthalmology)

University of Rochester (Dept. of Physics and Astronomy)

1997

Columbia University (Dept. of Ophthalmology)

Silesian Technical University, Gliwice, Poland (Dept. Physical Chemistry and Polymer Technology)

University of Bremen, Germany (Center for Complex Systems and Visualization).

Florida Atlantic University (Dept. of Electrical Engineering)

1998

Columbia University (Dept. of Ophthalmology)

Borders, Ft. Lauderdale

Technion, Haifa, Israel (Dept. of Physiology and Biophysics)

Technion, Haifa, Israel (Dept. of Physics)

University of Texas Medical Branch, Galveston, TX (Dept. of Ophthalmology)

University of Texas Medical Branch, Galveston, TX (Dept. of Physiology and Biophysics)

1999



Florida Atlantic University (Center for Molecular Biology & Biotechnology)

Rhode Island College (Department of Mathematics)

University of Technology, Darmstadt, Germany (Botanical Institute)

2000

Florida Atlantic University (Dept. of Physics)

Mayo Clinic, Rochester, MN (Dept. of Biochemistry & Molecular Biology)

University of Michigan, MI (Center for the Study of Complex Systems)

Florida Atlantic University (Center for Molecular Biology & Biotechnology)

University of Technology, Darmstadt, Germany (Botanical Institute)

GSI (Gesellschaft für Schwerionenforschung) Darmstadt, Germany (Dept. of Material Sciences)

Dalhousie University, Halifax, Canada (Dept. of Physiology & Biophysics)

University of Miami School of Medicine (Grand Rounds: Daughtry Family Dept. of Surgery & UM/JM Burn Center)

2001

Keck Graduate Institute of Applied Life Sciences

University of Texas Health Science Center Houston (Center for Computational Medicine)

University of Giessen, Germany (Institute for Theoretical Physics III)

University of Bremen, Germany (Center for Complex Systems and Visualization and Center for Medical Diagnostic Systems and Visualization)

Max Planck Institute for Flow Research (Max-Planck-Institut für Strömungsforschung), Göttingen, Germany (Department of Nonlinear Dynamics)

Syracuse University, New York (Dept. of Physics)

Florida Atlantic University (Center for Molecular Biology & Biotechnology)

2002

Naval Research Laboratory, Washington, DC (Plasma Physics Div.)

2003

Florida Atlantic University (Center for Molecular Biology & Biotechnology)

2005

Syracuse University (Department of Physics)

2006

International University Bremen, Germany (International Center for Transdisciplinary Science)

Florida Atlantic University (Division of Research, Lunch and Learn)

2007

Champlain College, St-Lambert, QC, Canada (Pedagogical Day Winter 2007)

Broward Community College (Davie FL, Pembroke Pines FL)

College of Charleston, Charleston, SC (Biology Department)

Medical University of South Carolina, Charleston SC (Hollings Marine Laboratory)

Florida Atlantic University (Department of Psychology)

MeVis Research Center for Medical Imaging Computing, Bremen, Germany

International Center for Cooperation and Conflict Resolution, Teachers College, Columbia University,  
New York, NY

2008

Helmholtz Zentrum Munchen, Institute for Bioinformatics and Systems Biology, Munich, Germany

2009

Florida Atlantic University, Frontiers in Science Public Lecture Series, Boca Raton, FL

2010

City College, City University of New York, Department of Chemistry.

## **TEACHING**

### **Harvard University - Teaching Fellow**

Natural Sciences 9 - History and Introduction to Astronomy

Astronomy 8 - Astronomy for Nonscience Students

Astronomy 14 - Advanced Astronomy for Nonscience Students

**Cambridge Center for Adult Education - Instructor**

The Astronomical Universe - astronomy for nonscientists

**Columbia University, College of Physicians and Surgeons**

Basic Science Course for Residents in Ophthalmology

Lecture: Why are eyes round?

Lecture: Intercellular junctions

Physiology Graduate Course G4001 - Introduction to Membrane Biophysics

Lecture: Kinetics of ion channels

Physiology 101F - Human Physiology for Medical and Dental Students

Laboratory: Resting and action potentials in single muscle fibers

Anatomy 101F - Microscopic Anatomy for Medical and Dental Students

Laboratory: Anatomy of the eye

**University of Jyväskylä, Finland**

International Summer School CH3 - Nonlinear Chemical and Physical Processes in Biology

**University of Alberta, Alberta, Canada**

Examiner on Ph.D. committee of A. Pece in the Department of Physiology

**Silesian Technical University, Gliwice, Poland**

Examiner on Ph.D. committee of Z. Siwy in the Department of Physical Chemistry

and Polymer Technology

**University of Technology, Darmstadt, Germany**

Graduiertenkolleg 340 - Fractal Geometry in Biology

**Jacobs University, Bremen Germany**

Heraeus International Summer School - Statistical Physics of Gene Regulation

**Florida Atlantic University**

Courses:

Psychology PSY 3213 - Research Methods in Psychology

Psychology PSY 4906 - Directed Independent Undergraduate Study

Psychology PSY 5721 - Fractals and Chaos in the Life Sciences

Psychology PSY 5930 - Fractals and Chaos in the Life Sciences

Psychology PSY 3502 - Fractals in Psychology

Psychology ISC 6908 - Directed Independent Graduate Study

Psychology ISC 6930 - Methods in Complex Systems

Psychology PSY 6930 - Research in Psychobiophysics

Mathematics MAT1932 - Mathematics & Science of Fractals

Psychology PSY 4930 - Psychology of the Internet

Complex Systems ISC 6937 - Proseminar

Psychology PSY 5930 - Complexity for the Life Sciences

Complex Systems ISC 6930 - Seminars in Neuroscience

Master Students -Primary Advisor

Jay Michaels, awarded 2009.

Master Students - Committe Member

T. Holroyd (Psychology), M.A. awarded.

K. Kogan (Psychology)

J. Fernandes (Biological Sciences), M.A. awarded.

R. Deitsch (Chemistry and Biochemistry)

D. Knickerbocker (Biological Sciences)

Ph.D. Students - Primary Advisor

L. Shehadeh (Complex Systems and Brain Sciences), Ph.D. awarded 2002.

Young-Ah Rho (Complex Systems and Brain Sciences) (Co-Advisor), Ph.D. awarded 2009.

Carey Witkov (Complex Systems and Brain Sciences)

Jay Michaels (Psychology)

Michael Norman (Complex Systems and Brain Sciences)

Ph.D. Students - Committee Member

C. Anderson (Psychology), Ph.D. awarded.

T. Dineva (Physics), Ph.D. awarded.

M. Rockloff (Psychology), Ph.D. awarded.

Z. Albo (Complex Systems and Brain Sciences), Ph.D. awarded.

R. Sambrook (Complex Systems and Brain Sciences), Ph.D. awarded.

R. Gross (Physics). Ph.D. awarded.

Katharine Kaye McMillan (Psychology), Ph.D. awarded 2005

**PUBLICATIONS**

**Books:**

J. Bassingthwaight, L. Liebovitch and B. West. 1994. *Fractal Physiology*. Volume 2 in the series Methods in Physiology from the American Physiological Society. Oxford University Press, New York.

L. S. Liebovitch. 1998. *Fractals and Chaos Simplified for the Life Sciences*. Oxford University Press, New York.

L. S. Liebovitch and L. A. Shehadeh. 2003. *The Mathematics and Science of Fractals (CD-ROM)*. Deco Bytes Education, LLC. <http://www.decobyteseducation.com/>

C. T. Brown and L. S. Liebovitch. 2010. *Fractal Analysis, Quantitative Applications in the Social Sciences*, Volume 165, SAGE Publications (Los Angeles, CA).

**Chapters in books:**

P. Ganatos, S. Weinbaum, J. Fischbarg, and L. S. Liebovitch. 1981. A hydrodynamic theory for the passage of spherical molecules through an extracellular cleft. In *Adv. Bioengr.*, Ed. Van C. Mow, ASME, N.Y.

L. S. Liebovitch and S. Weinbaum. 1983 A model of epithelial water transport. In *Fourth Int'l Conf. Physicochemical Hydrodynamics*, Ed. R. Pfeffer, N.Y. Acad. Sci., **404**:54- 56.

L. S. Liebovitch, J. Fischbarg, and J. P. Koniarek. 1987. Cellular automata model for interacting cell membrane ion channels. In *Perspectives in Biological Dynamics and Theoretical Medicine*, Eds. S. H. Koslow, A. J. Mandell, and M. F. Shlesinger, N.Y. Acad. Sci., **504**:299-300.

J. P. Koniarek, J. Fischbarg, and L. S. Liebovitch. 1988. The corneal endothelium: its physiological properties as related to survivability of the cornea. In *Cellular and Molecular Aspects of Eye Research*, Eds. G. C. Lavers and J. H. Chen, Sino-American Tech., NY, pp. 120-128.

J. Fischbarg, L. S. Liebovitch, and J. P. Koniarek. 1988. Inhibition of water flow across rabbit corneal endothelium by blockers of the glucose transporter. In *The Cornea: Trans. World Congr. Cornea III*, Ed. H. D. Cavanagh, Raven Press, NY, pp. 107-109.

L. S. Liebovitch. 1989. Introduction to the properties and analysis of fractal objects, processes, and data. In *Advanced Methods of Physiological Systems Modeling Vol. II*, Ed. V. Z. Marmarelis, Plenum, NY, pp. 225-239.

L. S. Liebovitch and T. I. Tóth. 1990. Fractal activity in cell membrane ion channels. In *Mathematical Approaches to Cardiac Arrhythmias*, Ed. J. Jalife, N.Y. Acad. Sci., **591**:375-391.

L. S. Liebovitch. 1994. Fractal analysis of channel mechanisms, In *ACS Adv. in Chem. No. 235, Biomembrane Electrochemistry*, Eds. M. Blank and I. Vodyanoy, Am. Chem. Soc., Washington DC, pp. 357-374.

L. S. Liebovitch. 1994. Single channels: from Markovian to fractal models. In *Cardiac Electrophysiology: From Cell to Bedside, 2nd ed.*, Eds. D. P. Zipes and J. Jalife, W. B. Saunders, Philadelphia, PA, pp. 293-304.

L. S. Liebovitch, N. A. Arnold, and L. Y. Selector. 1994. Neural networks to compute molecular dynamics. In *Intelligent Engineering Systems Through Artificial Neural Networks Vol. 4*, Eds. C. H. Dagli, B. R. Fernandez, J. Ghosh, and R. T. S. Kumara, ASME Press, NY, pp. 843-848.

T. H. Haines and L. S. Liebovitch. 1995. A molecular mechanism for the transport of water across phospholipid bilayers. In *Permeability and Stability of Lipid Bilayers*, Eds. E. A. Disalvo and S. A. Simon, CRC Press, Boca Raton FL, pp. 123-136.

L. S. Liebovitch. 1996. Ion channel kinetics. In *Fractal Geometry in Biological Systems*, Eds. P. Iannaccone and M. Khokha, CRC Press, Boca Raton FL, pp. 31-56.

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