

Ariel Fernández Stigliano, Ph. D.* Curriculum Vitae

*Also styled as Ariel Fernández

Born in Bahía Blanca, Argentina, April 8, 1957
US and Argentine citizen



Main websites:

[Scientific website](#)

[Ariel Fernandez Consultancy](#)

[AF Innovation](#)

[Ariel Fernandez ResearchGate](#)

[Ariel Fernandez Google Scholar Citations](#)

[Ariel Fernandez Wikipedia \(Mandarin\)](#)

[Ariel Fernandez Baidu Encyclopedia \(Mandarin\)](#)

[Ariel Fernandez Books](#)

[Physics at the Biomolecular Interface \(Latest Book\)](#)

Current Positions

- Senior Investigator, Argentine National Research Council (CONICET) (2011-).

Instituto Argentino de Matemática

“Alberto P. Calderón”

1083 Buenos Aires, Argentina

- [Former Karl F. Hasselmann Chaired Professor of Bioengineering, Rice University](#)

- Expert scientifique, Comité d'Evaluation Scientifique, Innovation Biomédicale (CE18), Agence Nationale de la Recherche, France (2015-)
- Chief Scientific Officer and Vicepresident, ProWDSciences, Inc. ([Protein-Water Dehydron](#)), 2013-

ProWD Sciences in the web:

[National Science Foundation: Leading Scientists Discuss Converging Technologies: Sangtae Kim \(ProWD Sciences\)](#)
[Physics Wiki, London](#)

- Honorary Investigator, Collegium Basilea, Institute of Advanced Study, CH 4053 Basel, Switzerland (2006-)
- Visiting Professor, National Tsing-Hua University, Hsinchu, Republic of China (2010-)
- President, [AF Innovation](#), SRL, a Pharmaceutical Consultancy (2010-).
- Vicepresident and Chief Scientific Officer at [Ariel Fernandez Consultancy](#), GmbH, a Biotechnology firm specialized in dynamic molecular design (2013-)
- CSO, Coeur-Tek, a biotech company focused on heart failure (US patent #9,051,387), to be incorporated.

Past Appointments

- Karl F. Hasselmann Endowed Chair Professor of Engineering, Rice University, Department of Bioengineering, Rice University, Houston, TX 77005 (2005-2011)
- Professor of Bioengineering, Rice University (retired)
- Rice Research Professor (2011)
- Distinguished Investigator, [PI Pharmaceutical Informatics, Morgridge Institute for Research at the University of Wisconsin-Madison, Madison](#), Wisconsin 53715 (2011-2012)
- Adjunct Professor of Molecular Therapy, M. D. Anderson Cancer Center (UTMC) (2006-)
- Adjunct Professor (2006-2008) and Visiting Scholar (2008-2012), Computer Science Department, The University of Chicago.
- Senior Scientific Consultant, Eli Lilly and Company (2004-2011).

Primary research foci

Pharmacoinformatics and Pharmacogenomics; Translational Medical Informatics; Molecularly Targeted Cancer Therapy; Clinical Kinomics; Integrative Biology; Bioinformatics; Discovery Informatics; Systems Bioengineering; Molecular Theranostic Engineering; Physical Chemistry; Molecular Biophysics, Dehydron Physics

Education

- [Ph. D. Yale University, 1984](#)
(fastest awarded Yale Ph. D. on record).
 - Sr. Research Scientist, Max-Planck-Institut fuer biophysikalische Chemie, Division of Nobel Laureate [Manfred Eigen](#), Goettingen, Germany, 1986-1989.
 - Research Associate (1985-1987), Visiting Senior Research Scientist (1994-1996), Princeton University.
 - Licenciado en Matematica (1980), Quimico (1979), Universidad Nacional del Sur, Bahia Blanca, Argentina.
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Parameters

- Intelligence IQ 151 (test# e2a3fa0b)
- Citations* 3570
- h-index* 31
- i10-index* 98

(*) Source: [Google Scholar Citations for Ariel Fernandez](#), 5/10/2016.

Summary of Personal Accomplishments

Ariel Fernández introduced what appears to be the correct formulation for **self-organization in nonequilibrium thermodynamics** by realizing that the thermodynamically relevant degrees of freedom must belong to a **center manifold**, an algebraically closed entity, and not to an attractor, as Ilya Prigogine previously assumed. He has provided a **semiempirical solution to the protein folding problem** by introducing the **epistructural tension**, a measure of the distortion of the water structural matrix that requires a multi-scale theory of dielectrics. He rationally discovered a ligand biologic that would competitively **disrupt a protein-protein interface** for therapeutic purposes ([patent US 9,051,387](#)). He also managed to predict and control **induced folding** in drug-target associations. He introduced the concept of **dehydron**, a structural defect in soluble proteins that promotes its own dehydration and creates **epistructural tension**. A dehydron is a meta-structural feature of relevance in drug design, enzyme catalysis and protein folding. Ariel Fernández determined and measured the **dehydronic field**, the mechanical equivalent of the dehydration propensity of a dehydron exerted on a test nonpolar molecule and orthogonal to the Coulombic field. His current efforts are devoted to show that dehydrons are endowed with a catalytic role as enablers and stimulators of enzymatic activity. This research on the chemical functionality of structural

defects in soluble proteins is expected to have paramount implications in molecular medicine as described in AF's latest book "[Physics at the Biomolecular Interface](#)" (May, 2016).

Awards and Previous Appointments

- Camille and Henry Dreyfus Teacher-Scholar Awardee, 1991
- Camille and Henry Dreyfus Distinguished New Faculty Awardee, 1989
- John S. Guggenheim Memorial Foundation Fellow, 1995-1996
- Consultant to U.S. Federal Government, NIH, Special Panel on Centers of Excellence in Systems Biology, 2003-
- National Cancer Institute (NCI) Reviewer. NIH Study Section RFA-07-005 "Advanced Proteomic Platforms and Computational Sciences for NCI Clinical Proteomic Technologies Initiative", 2006-
- Guest Professor, Institute for Protein Research, Osaka University, Japan, 2003
- Visiting Senior Researcher, Max-Planck-Institut fuer Biochemie, Abteilung Robert Huber, Martinsried, Germany, 2000-
- Visiting Senior Scientist, Institute for Nonlinear Science, University of California at San Diego, 1989
- Managing Editor, Frontiers in Bioscience, Encyclopedia of Bioscience, 2006-
- Editor, Journal of Biological Physics and Chemistry, Basel, Switzerland, 2000-
- Fulbright Scholar, US Information Agency, 1999 and Fulbright Fellow, 1981
- Alexander von Humboldt Foundation Awardee (1995)
- Max Planck Society Scholar, Goettingen, Germany (1987-1989)
- Feinberg Fellow, Israel, 1984-1985
- Full Professor, Indiana University School of Informatics, 2003-2005.
- Full Professor, Center for Computational Biology and Bioinformatics, Indiana University School of Medicine, 2003-2005.
- Elected Fellow, American Institute for Medical and Biological Engineering, 2006
- Full Professor and Principal Investigator, UNS and Natl. Res. Council of Argentina, 1994-2003.
- Medal "State of Buenos Aires" to the best graduate, Argentina, 1980
- Deputy Governor, American Biographical Institute, 1998-
- Co-organizer and Proceedings Editor of the Miami Bio/Technology Winter Symposium, Nature-sponsored, 1993.
- Chair, "Resistance and Safety"/Kinase Inhibitors, Cambridge Healthtech Institute's Sixth Annual "Discovery on Target" Symposium; October 20-23, Boston, MA, USA, 2008.
- Honorary Member, Collegium Basilea, Institute for Advanced Study, Basel, Switzerland, 2006-
- Adjunct Professor of Computer Science, The University of Chicago (2005-2008).
- Editorial Board Member, Journal of Postgenomics: Drug & Biomarker Development - Open Access, OMICS Publishing Group, 2010-
- Editorial Board Member, Journal of Bioengineering & Biomedical Science, OMICS Publishing Group, 2010-

- Editorial Board Member, Journal of Metabolomics: Open access, OMICS Publishing Group, 2012-
- Distinguished Scientific Leader Lecturer, Georgia Institute of Technology, 11/10/2010, Lecture title: "Evolutionary insights into the control of drug specificity". URL: <https://smartech.gatech.edu/handle/1853/36240?show=full>
- Columnist at Project Syndicate, The World's Opinion Page (2011-)
- Editorial Board Member, Journal of Pharmacogenomics & Pharmacoproteomics, OMICS Publishing Group, 2015-
- Expert scientifique, Comité d'Evaluation Scientifique, Innovation Biomédicale (CE18), Agence Nationale de la Recherche, France, 2015-

Legal Consultancies - Pharmaceutical Patent Litigation

- Schiff/Hardin, LLP (Chicago-based Law Firm).
- Racoczy, Molino, Mazzocchi and Siwik, LLP (Chicago-based Law Firm)

Recent Grant support, PI: Ariel Fernandez

- NIH Grant Award 1R01 GM072614 from the National Institute of General Medical Sciences (NIGMS). Title: "Protein packing defects as functional markers and drug targets". Total amount of award: \$1.6million (2005-2009).
- Eli Lilly and Company, Unrestricted research funds (2004-2011)

Recent Lectures

- Seminar lecture: "Curbing drug side effects by exploiting integrative ideas in molecular biophysics", Computations in Science Seminars, Kersten Physics Teaching Center, The University of Chicago, November 28 (2007).
- Keynote speaker: "Curbing the Cardiotoxicity of Kinase Inhibitors: The Methyl that Saved the Heart", *Discovery on Target 2007*, Cambridge Healthtech Institute Fifth Annual, "Developing inhibitors for Promising Drug Targets", World Trade Center, Boston, MA, October 15-18 (2007).
- "7th International Workshop on Pharmacodynamics of Anticancer Agents", organized by the University of Chicago, Guanacaste, Costa Rica, September 16-20 (2007).
- "Re-engineering of Imatinib to Decrease Cardiac Risk: Translational Ideas in Drug Discovery", *World Pharmaceutical Congress*, Cambridge Healthtech Institute Second Annual "Cardiotoxicity and Drug Safety", Philadelphia, PA, May 12-13 (2008).
- "Curbing side effects in anticancer drugs", in "Science for Health with a Human Face", *International Symposium* (4 Nobel laureates in attendance), Madrid, Spain, November 4-7 (2008).
- "Translational ideas in drug discovery", Guest lecturer, *Genomics Research Center, Academia Sinica*, Taipei, Taiwan, June 14-21 (2008).

- Keynote speaker and Chair, “Resistance and Safety”. Lecture title: “Translational ideas to curb side effects in anticancer kinase-targeting therapy: Reducing cardiotoxicity through inhibitor redesign”. Cambridge Healthtech Institute’s Sixth Annual “Discovery on Target”/KINASE INHIBITORS; October 20-23, 2008, Boston, MA, USA.
 - Lecturer, 238th American Chemical Society National Meeting & Exposition. ACS paper 251: “Translational ideas in molecular therapy: Re-engineering anticancer drugs to curb side effects”; section “Novel Approaches to fine tune anticancer drugs to achieve acceptable clinical outcomes, Walter E. Washington Convention Center, August 16-20, 2009, Washington DC, USA.
 - Lecturer, “Frontiers in Pharmacology” Seminar Series, University of California at Davis, Department of Pharmacology, GBSF Auditorium, October 23, 2009, UC Davis, Davis CA, USA.
 - Keynote speaker, “Origin of Life: Molecular origins, Extinction, Life in Extremes, Species Diversification”, Vienna Biocenter, Noviembre 18, 2010, Vienna, Austria, sitio web: www.originoflife2010.com
 - Distinguished Scientific Leader Lecturer, Georgia Institute of Technology, 11/10/2010, Lecture title: “Evolutionary insights into the control of drug specificity”. URL: <https://smartech.gatech.edu/handle/1853/36240?show=full>
 - Chair of Session “Protein Kinase Inhibitors in Cancer” (# 5-8), Speech title: “Translational Ideas in Molecular Cancer Therapy”, BIT Life Sciences’ 4th Annual Protein & Peptide Conference (PepCon 2011), Beijing, China, March 23-25, 2011.
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Patents

- **US 8,466,154 B2** (awarded)

Ariel Fernández et al.: “Methods and Composition of Matter Related to Wrapping of Dehydrons”. Inventors: Ariel Fernández, William Bornmann, Gabriel Lopez-Berestein, Angela Sanguino, Zeng-Hong Peng, Anil K. Sood. Awarded: June 18, 2013.

- **US 9,051,387 B2** (awarded)

Richard L. Moss and Ariel Fernández: “Inhibition of MYBP-C binding to myosin as a treatment for heart failure”. Inventors: Richard L. Moss and Ariel Fernández; Asignee: Wisconsin Alumni Research Foundation. Awarded: June 9, 2015.

Books

- Author: Ariel Fernández
 Title: “[Transformative Concepts for Drug Design: Target Wrapping](#)”
 Publisher: Springer, Heidelberg, Berlin (240 pages)
 ISBN: 978-3-642-11791-6
 Publication year: 2010.

- Author: Ariel Fernández Stigliano
Title: “[Biomolecular Interfaces: Interactions, Functions and Drug Design](#)”
Publisher: Springer, Heidelberg, Berlin (372 pages)
ISBN: 978-3319168494
Publication year: 2015.
- Author: Ariel Fernández
Title: “[Physics at the Biomolecular Interface: Fundamentals for Molecular Targeted Therapy](#)” (488 pages)
Publisher: Springer International Publishing, Switzerland
[Soft and Biological Matter Series](#)
ISBN: 978-3-319-30851-7
Publication year: 2016.
- Authors: L. Ridgway Scott and Ariel Fernández
Title: “Mathematical Approach to Protein Biophysics”
Publisher: SIAM (280 pages)
In press
Publication year: 2017.

Critiques on recent work

- *Nature* **432**, 688 (2004)
News and Views article on: Despa, F., Fernandez, A. and Berry, R.S. Dielectric modulation of biological water. *Phys. Rev. Lett.* **93**, 228104 (2004)
- *Journal of Clinical Investigation* **117**, 3650-3653 (2007)
Commissioned Editorial Commentary by George Demetri on: Fernández, A. *et al.* An anticancer C-Kit kinase inhibitor is re-engineered to make it more active and less cardiotoxic. *Journal of Clinical Investigation* **117**, 4044-4054 (2007)
- *Nature Reviews Drug Discovery* **7**, 120-121 (2008)
Research Highlights, “Anticancer drugs: Redesigning kinase inhibitors”, on: Fernández, A. *et al.* An anticancer C-Kit kinase inhibitor is re-engineered to make it more active and less cardiotoxic. *Journal of Clinical Investigation* **117**, 4044-4054 (2007)
- *Chemical & Engineering News (ACS)* **86**, number 09, p.31 (2008)
Science & Technology Concentrates: “Drug Design Strategy Aims for Disorder”, on: Crespo, A. and Fernández, A. Induced disorder in protein-ligand complexes as a drug-design strategy”. *Molecular Pharmaceutics* (ACS), published online February 16, 2008.
- *Nature*, News and Views on Ariel Fernandez and Michael Lynch, *Nature* 474, 502-505 (2011). Philip Ball “The Achilles Heel of Biological Complexity”
Published online 18 May 2011 | *Nature* | doi:10.1038/news.2011.294

Critique Excerpts

The research by Fernández and collaborators (cf. *Journal of Clinical Investigation* **117**, 4044-4054 (2007)) has been auspiciously received by key researchers in cancer therapy and is being perceived as a conceptual and technical breakthrough. Thus, Harvard Medical School Professor *George Demetri*, director of the Center for Sarcoma and Bone Oncology at Dana-Farber Cancer Institute, wrote:

"The approach used here by Fernández et al. holds great promise to allow more customized development of rationally designed therapeutic agents."

"...with tools such as those described by Fernández et al., the future certainly looks bright for constructing ever-better agents that can be combined safely and effectively to manage, and eventually cure, many forms of human cancer." (from Demetri's Commentary, *Journal of Clinical Investigation* **117**, 3650-3653, 2007).

Thomas Force, Wilson Professor of Medicine at Thomas Jefferson University, who first characterized and reported imatinib cardiotoxicity in his 2006 *Nature Medicine* article, said:

"...this knowledge could potentially steer drug development away from targets and pathways that would lead to toxicity, but would leave tumor cell killing intact. Fernández and co-workers, in this really remarkable piece of work, have proven that this is indeed possible. Their findings will hopefully encourage drug makers to pursue a similar approach of "rational drug re-design" (and drug design) in the development of new anti-cancer agents..."

<http://www.medicalnewstoday.com/articles/90646.php>

In "Chemistry World" (Royal Society of Chemistry, UK), Force added:
"The biggest message of this paper is that a cardiotoxic cause can be identified and steered away from. There are hundreds of agents in development that could benefit from this research."

<http://www.rsc.org/chemistryworld/News/2007/December/03120703.asp>

The research by Fernández also received coverage from the popular press (*Reuters*):

<http://www.reuters.com/article/healthNews/idUSN0341290220071203>

The Fernandez contribution was highlighted in *Nature Reviews Drug Discovery* **7**, 120-121 (February 2008). (Research Highlights, "Anticancer drugs: Redesigning kinase inhibitors"). Thus, *Nature Reviews* editor Sarah Crunkhorn wrote:

"In summary, WBZ_4 [the drug designed by the Fernandez team] could have potential as a novel therapy for *GISTs* [gastro-intestinal stromal tumors], and

the approach demonstrated in the study might also be applied to engineer the specificity of other kinase inhibitors with the aim of creating safer and more effective drugs.”

Other Recent Critiques

The paper: Ariel Fernández (2012) Episturctural tension promotes protein associations, *Physical Review Letters* **108**, 188102 has been reviewed in *Chemical & Engineering News* and *Physics/Focus (American Physical Society)*:

“Protein Binding Hot Spots” by Jyllian Kemsley
Chemical & Engineering News, **90**(20), May 14, 2012 [Science & Technology, Concentrates]

“Focus: Proteins Hook up Where Water Allows”. May 4, 2012, *Physics* **5**, 51 (2012), DOI: 10.1103/Physics.5.51, URL: <http://physics.aps.org/articles/v5/51>

The paper: Ariel Fernández and Michael Lynch, Nonadaptive origins of interactome complexity”. *Nature* **474**, 502-505 (2011) has been reviewed in *Scientific American* and *Nature/News*:

“Why Are You So Complex? Complicated Protein Interactions Evolved to Stave Off Mutations” by Philip Ball. *Scientific American*, May 18, 2011. URL:<http://www.scientificamerican.com/article/complicated-protein-interactions-evolved-to-stave-off-mutations/>

“The Achilles' heel of biological complexity” by Philip Ball, *Nature*, 18 May 2011, doi:10.1038/news.2011.294
URL:<http://www.nature.com/news/2011/110518/full/news.2011.294.html>

Some recent doctoral thesis directed by Ariel Fernández

Molecular basis of gene dosage sensitivity

Jianping Chen

Rice University, Department of Physics and Astronomy, 2009

<https://scholarship.rice.edu/handle/1911/61791>

Specificity in the druggable kinome: Molecular basis and its applications

Xi Zhang

Rice University, Department of Physics and Astronomy, 2009

<https://scholarship.rice.edu/handle/1911/61945>

Selected publications

- Ariel Fernández, Tobin R. Sosnick and Andrés Colubri: “Dynamics of hydrogen-bond desolvation in folding proteins”, *Journal of Molecular Biology* 321, 659-675 (2002).
- Ariel Fernández and Harold A. Scheraga: “Insufficiently dehydrated hydrogen bonds as determinants for protein interactions”, *Proceedings of the National Academy of Sciences, USA* 100, 113-118 (2003).
- Ariel Fernández and R. Stephen Berry: “Proteins with hydrogen-bond packing defects are highly interactive with lipid bilayers: Implications for amyloidogenesis”, *Proceedings of the National Academy of Sciences, USA* 100, 2391-2396 (2003).
- Ariel Fernández and Ridgway Scott: “Adherence of packing defects in soluble proteins”, *Physical Review Letters* 91, 018102, 4 pages (2003).
- Ariel Fernández, Kristina Rogale, L. Ridgway Scott and Harold A. Scheraga: “Inhibitor design by wrapping packing defects in HIV-1 proteins”. *Proceedings of the National Academy of Sciences, USA* 101, 11640-11645 (2004).
- Ariel Fernández and R. Stephen Berry: “Molecular dimension explored in evolution to promote proteomic complexity”. *Proceedings of the National Academy of Sciences, USA* 101, 13460-13465 (2004).
- Ariel Fernández: “Keeping Dry and Crossing Membranes”. *Nature Biotechnology* 22, 1081-1084 (2004).
- Ariel Fernández, et al.: “An anticancer C-kit kinase inhibitor is re-engineered to make it more active and less cardiotoxic”. *Journal of Clinical Investigation* 117, 4044-4054 (2007).
- Jianping Chen, Han Liang and Ariel Fernández: “Protein structure protection commits gene expression patterns”. *Genome Biology* 9, R107 (2008).
- Ariel Fernández and Jianping Chen: “Human capacitance to dosage imbalance: Coping with inefficient selection”. *Genome Research* 19, 2185-2192 (2009).
- Ariel Fernández and Michael Lynch: “Nonadaptive origins of interactome complexity”. *Nature* 474, 502-505 (2011).
- Ariel Fernández: “Epistructural tension promotes protein associations”. *Physical Review Letters* 108, 188102 (2012).

Ariel Fernández Stigliano Bibliography

Sources: [ResearchGate](#), [Google Scholar Citations](#), [Baidu Encyclopedia](#) (Mandarin) and [Wikipedia](#) (Mandarin)

1. (1980) Ariel Fernandez: "On a Generalization of the Krull-Schmidt Theorem," Proceedings of the V National Congress of Mathematics, Cordoba, Argentina, 1980, Universidad de Cordoba Reports, IMAF #5, pages 61-68 (1980). Proceedings
2. (1982) Ariel Fernandez and Oktay Sinanoglu: "[The Lifting of an Inonu-Wigner Contraction at the Level of Universal Coverings](#)," Journal of Mathematical Physics 23, 2234 (1982) (3 pages).
3. (1984) Ariel Fernandez and Oktay Sinanoglu: "Symmetry-Breaking Instabilities under Nonclassical Bifurcation Conditions," Physical Review A 29, 2029 (1984) (3 pages).
4. (1984) Ariel Fernandez and Oktay Sinanoglu: "Spatial-Temporal dissipative Structures in Open Reactive Systems with a Negative Feedback Loop," Biosystems 17, 3 (1984) (8 pages).
5. (1984) Ariel Fernandez and Oktay Sinanoglu: "Locally Attractive Normal Modes for Chemical Processes," Journal of Mathematical Physics 25, 2576, (1984) (7 pages).
6. (1984) Ariel Fernandez and Oktay Sinanoglu: "Global Attractors and Global Stability for Closed Chemical Systems," Journal of Mathematical Physics 25, 406 (1984) (4 pages).
7. (1984) Ariel Fernandez and Oktay Sinanoglu: "Directed Graphs for Structurally-Stable PES's representing A-Priori Reaction Pathways," Theoretica Chimica Acta 65, 179 (1984) (8 pages).
8. (1984) Ariel Fernandez and Oktay Sinanoglu: "Conditions for the Validity of Ginzburg-Landau Equations in Far-From Equilibrium Kinetics," Physical Review A 30, 1522 (1984) (3 pages).
9. (1984) Ariel Fernandez and Oktay Sinanoglu: "The Structural Stability Restriction Rules Out Certain SN2 Pathways," Theoretica Chimica Acta 66, 147 (1984) (3 pages).
10. (1985) Ariel Fernandez: "Subordination of Fast-Relaxing Degrees of Freedom to Order Parameters under Ginzburg-Landau Regimes," Physical Review A 31, 2738 (1985) (2 pages).
11. (1985) Ariel Fernandez: "Pattern of Separatrices and Intrinsic Reaction Coordinates for Degenerate Thermal Rearrangements," Theoretica Chimica Acta 67, 229 (1985) (8 pages).

12. (1985) Ariel Fernandez and Oktay Sinanoglu: "Subordination of the Fast-Relaxing Degree of Freedom in the Center Manifold of the Belousov-Zhabotinsky System," *Physical Review A* 31, 2736 (1985) (2 pages).
13. (1985) Oktay Sinanoglu and Ariel Fernandez: "Solvophobic Forces and Molecular Surface Area Changes in Drug-Biomolecule Associations," *Biophysical Chemistry* 21, 167 (1985) (5 pages).
14. (1985) Ariel Fernandez and Oktay Sinanoglu: "Denaturation of Proteins in Methanol/Water Mixtures," *Biophysical Chemistry* 21, 163 (1985) (5 pages).
15. (1985) Ariel Fernandez and Oktay Sinanoglu: "A Reactive System with Diffusive Transport Displaying Two Different Symmetry-Breaking Dissipative Structures," *Zeitschrift fur Naturforschung* 40a, 611 (1985) (8 pages).
16. (1985) Oktay Sinanoglu and Ariel Fernandez: "Denaturation Maxima of Proteins and of Drug-Biomolecule Complex Formation," *Biophysical Chemistry* 21, 157 (1985) (6 pages).
17. (1985) Ariel Fernandez: "[1,3-Sigmatropic Thermal Rearrangements as Vector Fields on the 2-Sphere](#)," *Journal of Chemical Physics* 82, 3123 (1985) (5 pages).
18. (1985) Ariel Fernandez: "Center Manifold Extension of the Adiabatic Elimination Method," *Physical Review A* 32, 3070 (1985) (4 pages).
19. (1985) Ariel Fernandez: "A Reduction Scheme for Explosive Chemical Kinetics," *Journal of Chemical Physics* 83, 4488 (1985) (4 pages).
20. (1985) Ariel Fernandez: "Jahn-Teller Distortion Motions as Separatrices in PES," *Theoretical Chimica Acta* 68, 285 (1985) (6 pages).
21. (1985) Ariel Fernandez: "Global Instability of a Monoparametric Family of Vector Fields Representing the Unfolding of a Dissipative Structure," *Journal of Mathematical Physics* 26, 2632 (1985) (3 pages).
22. (1986) Ariel Fernandez and Herschel Rabitz: "Fundamental Sensitivity Propagators in Dissipative Systems," *Physical Review A* 33, 1913 (1986) (8 pages).
23. (1986) Ariel Fernandez: "Pattern of Intrinsic Reaction Coordinates and Separatrices for a Symmetry-Forbidden Reaction," *Zeitschrift fur Naturforschung* 41a, 529 (1986) (5 pages).

24. (1986) Ariel Fernandez: "Triangulation of the Lowest Energy Sheet for the Jahn-Teller PES," *Zeitschrift fur Naturforschung* 41a, 532 (1986) (5 pages).
25. (1986) Ariel Fernandez: "Predicted Power Spectra for Subordinated Variables in Periodic Instabilities," *Physics Letters A* 114A, 346 (1986) (5 pages).
26. (1986) Ariel Fernandez: "The Steady State Approximation as a Center Manifold Elimination in Chemical Kinetics," *Journal of the Chemical Society. Faraday Transactions II* 82, 849 (1986) (6 pages).
27. (1986) Ariel Fernandez and Herschel Rabitz: "Autocorrelations in the Center Manifold of Dissipative Systems," *Physical Review A* 33, 3314 (1986) (6 pages).
28. (1986) Ariel Fernandez: "Homology of a Structurally-Stable Chemical Rearrangement," *Zeitschrift fur Naturforschung* 41a, 256 (1986) (5 pages).
29. (1986) Ariel Fernandez: "Almost-Split Sequences and Morita-Duality," *Bulletin des Sciences Mathematiques 2e series* 110, 425 (1986) (12 pages).
30. (1987) Ariel Fernandez and Herschel Rabitz: "Entrainment by Periodic Perturbations in the Center Manifold at Ginzburg-Landau Regimes," *Physical Review A* 34, 2307 (1987) (8 pages).
31. (1987) Ariel Fernandez: "Homology of Potential Energy Surfaces," *Zeitschrift fur Naturforschung* 41a, 1118 (1987) (4 pages).
32. (1987) Herschel Rabitz and Ariel Fernandez: "Energetic Materials Dynamics", in *Proceedings on the Workshop on Energetic Materials, Los Alamos NM, October 14, 1986; published by the Chemical Propulsion Information Agency, #475; (1987) page 247 (2 pages).* proceedings
33. (1987) Ariel Fernandez and Herschel Rabitz: "Transition to a Convective Roll Pattern as obtained from the Stochastic Center Manifold Theory," *Physical Review A* 35, 764 (1987) (4 pages).
34. (1987) Ariel Fernandez: "Virtual Size Parameter for the Scaling of Fluctuations at the Onset of a Center manifold in Dissipative Systems," *Physics Letters A* 119A, 168 (1986) (6 pages).
35. (1987) Ariel Fernandez: "Theory for Scaling of Fluctuations in Thermal Explosion Conditions," *Berichte der Bunsengesellschaft. Physikalische Chemie* 91, 159 (1987) (5 pages).
36. (1987) Ariel Fernandez: "Renormalization Group from a Center Manifold Reduction in Dynamical Critical Phenomena," *Berichte der Bunsengesellschaft. Physikalische Chemie* 91, 570 (1987) (4 pages).

37. (1987) Ariel Fernandez: "Intrinsic Fluctuations Determined by the Existence of a Center Manifold," *Journal of Physics A Letters* 20, L509 (1987) (5 pages).
38. (1987) Ariel Fernandez: "Statistics of the Ensemble of Primary Structures for Inhomogeneous Polymer Chains," *International Journal of Theoretical Physics* 26, 495 (1987) (5 pages).
39. (1987) Ariel Fernandez: "Statistics of Disordered Polymers: an Effective Hamiltonian and its Associated Gibbs Measure," *Berichte der Bunsengesellschaft, Physikalische Chemie* 91, 753 (1987) (4 pages)
40. (1987) Ariel Fernandez: "Intrinsic Fluctuations associated with the Onset of a Center Manifold," *Journal of Physics A Letters* 20, L579 (1987) (4 pages).
41. (1987) Ariel Fernandez and Herschel Rabitz: "Center Manifold Renormalization in Dynamic Critical Phenomena for Dissipative Spin Systems," *Physical Review A* 35, 5203 (1987) (6 pages).
42. (1987) Ariel Fernandez: "Statistical Weights for Primary Structures in Inhomogeneous Polymer Chains," *Berichte der Bunsengesellschaft. Physikalische Chemie* 91, 611 (1987) (4 pages).
43. (1987) Ariel Fernandez: Book Review, "Renormalization Group Theory for Macromolecules", by Carl Freed, *Berichte der Bunsengesellschaft. Physikalische Chemie* 91, 683 (1987) (1 page). book review
44. (1987) Ariel Fernandez: "Boundary Conditions of the Time-Reversible Liouville Equation in order to Derive the Onset of a Convective Pattern," *Journal of Physics A, Letters*. 20, L 763 (1987) (6 pages).
45. (1987) Ariel Fernandez: Proceedings of the Workshop "Dynamic Days, Dusseldorf, June 11-14, 1987," *Physica D (Nonlinear Phenomena)*. proceedings
46. (1988) Ariel Fernandez: "Stochastic Interpretation of Lag Times for the Onset of Template Amplification in RNA Replication," *Journal of the Chemical Society. Faraday Transactions I*. 84, 1543 (1988) (6 pages).
47. (1987) Ariel Fernandez: "Intrinsic fluctuations in Macromolecular Self-Replicating Systems," *Berichte der Bunsengesellschaft Physikalische Chemie*. 91, 1002 (1987) (5 pages).
48. (1987) Ariel Fernandez and Herschel Rabitz: "Stochastic Theory of Ignition," *International Journal of Theoretical Physics*, 26, 1093 (1987) (10 pages).

49. (1987) Ariel Fernandez and Herschel Rabitz: "Effective Propagators for Quenched Disorder in Linear Polymers," *Biophysical Chemistry* 28, 89 (1987) (4 pages).
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