

## JORGE V. JOSÉ

Present Position: James H. Rudy Professor of Physics  
College of Arts and Sciences; IU Bloomington  
Member of the Stark Neuroscience Institute,  
Adjunct Professor of Integrative and Cellular Physiology,  
Indiana University Medical School, Indianapolis  
INDIANA UNIVERSITY

### Education and Training

Dr. Sc. (Theoretical Physics), UNAM*, (Advisor L. P. Kadanoff, U. Chicago)	1976
M.Sc. (Theoretical Physics), UNAM,	1973
B.Sc. (Theoretical Physics), UNAM,	1971
Research Associate, Brown University	1974 - 1976
Assistant Research Professor, Brown University	1976 - 1977
1 <sup>st</sup> James Franck Fellow, James-Franck Institute, University of Chicago	1977 - 1979
Assistant Research Professor, Rutgers University	1979 - 1980

\*UNAM= National University of Mexico

### Academic Positions

Chinese Academy of Sciences, President's International Fellowship Initiative, Award, Beijing; China	5-8-2018
Chinese Academy of Sciences, President's International Fellowship Initiative, Award, Beijing; China	4-6-2016
Kavli Institute visiting Scientist, Beijing	4-6 2016
Visiting Scientists, Salk Institute for Biological Sciences, La Jolla, CA	2016-
Visiting Professor, Center for Interdisciplinary Research, NU, Boston	2015
James H. Rudy Distinguished Professor of Physics	2010 –
Adjunct Professor of Integrative and Cellular Physiology, IUSM	2010-
Member of the Stark Neuroscience Institute, IUSM	2015-
Professor, Physics Department, SUNY at Buffalo	2005 – 2010
Adjunct Professor of Physiology and Biophysics, SUNY at Buffalo	2005 – 2010
Emeritus Matthews University Distinguished Professor, NU	2007-
Visiting Scientists, Salk Institute for Biological Sciences, La Jolla, CA	2000-2001
Visiting Professor, Center for Theoretical Physics, University of Utrecht, the Netherlands	1994-1995
Visiting Professor, Centro Atomico, Bariloche, Argentina (1-month/year/13 years)	1984-1997
Matthews University Distinguished Professor, NU	1996 – 2007
Professor of Physics, NU	1988–1996
Visiting Scientist, Saclay Nuclear Research Centre, Paris, France	1985
Visiting Scientists Laue-Langevin Institute, Grenoble, France	1984-1985
Associate Professor, NU	1984-1988
Assistant Professor, NU	1980-1984

Profesor Titular B, Instituto de Física, UNAM	1980-1981
Assistant Research Professor, Rutgers University	1979 - 1980
Guest Scholar, Kyoto University, Yukawa Institute, Japan	1977
1 <sup>st</sup> James Franck Fellow, James-Franck Institute, University of Chicago	1977-1979
Assistant Research Professor, Brown University	1976-1977
Research Associate, Brown University	1974-1976

### **Administrative positions**

System Vice President for Research, Indiana University	2010–2015
Vice President for Research, SUNY at Buffalo	2005–2010
Chair, Physics Department, Northeastern University (NU)	2004–2005
Interim Chair, Physics Department, NU	2002–2004
Founding Director, Center for Interdisciplinary Research on Complex Systems (CIRCS), NU	1995–2005

### **Honors/Awards**

Indiana University Bicentennial Medal	2020
Chinese Academy of Sciences President's International Fellow award, Beijing	2018
Chinese Academy of Sciences President's International Fellow award, Beijing	2016
Thomas Hart Benton Mural Medallion, Indiana University	2015
Member of the Alliance of Distinguished and Titled Professors, IU	2010-
Outstanding Referee, American Physical Society,	2009
Fellow American Association for the Advancement of Science AAAS	2007-
Manuel Sandoval-Vallarta Prize, Universidad Metropolitana, México	2004
Chercheur Etranger D'Haut Niveau et de Renommée Internationale, From the French Government,	2002
Corresponding Member, Mexican National Academy of Sciences	2000-
Fellow, American Physical Society	1997-
Thomas Brody Chair, National University of Mexico	1996
Eizen-Moshinsky Chair, National University of Mexico	1994
Robert D. Klein Distinguished Lecturer, Northeastern University	1993
Guest Scholar, Institute for Fundamental Physics, Kyoto University, Yukawa Institute, Japan	1977
James Franck Fellow, James Franck Institute, University of Chicago	1977–1979

### **Professional Association Activities**

- Association of American Universities (AAU) 2005-2015
- Association of Public and Land-grant Universities 2005-2015
- Big Ten Academic Alliance 2010-2015
- The US National Academies 2013-
- American Association for the Advancement of Sciences 2000-
- Mexican National Academy of Sciences 1997-
- American Physical Society 1980-

- Society for Neuroscience 1994-
- Program proposal reviewer for AAAS meetings 2013-

## **Consultant**

Corporate Research and Engineering, Exxon Corporation 1982  
 Research Advisor, National Council of Science and Technology, Mexico 1983-1986  
 Schlumberger-Doll Research Center, Connecticut 1984  
 American Association for the Advancement of Sciences 2013-  
 Reviewer for the National Academies Technical Reports 2011-

## **Highlights**

Co-organizer of Workshop on “*Topological Phase transitions and new developments*”, with Prof. M. Kosterlitz (2016 Nobel Laureate in Physics), Prof. L. Brink (former Chair of Nobel Physics Committee), Prof. M. Gunn (University of Birmingham) and Prof. K. K. Phua, Institute for Advance Studies, Nanyang University, Singapore. June 2017. Co-edited, with the organizers the Proceedings of the Meeting. Published by World Scientific, September 2018.

Appeared before Congress’s House Committee on Science, Space and Technology on 7-26-2011. *Importance of peer review system*

Funded continuously by NSF for 24 years. Also, by ONR and PRF.

Funded by NSF as co-PI. Collaboration with UCSD and Salk Institute for Biological Sciences (2016-2020). Title “*Learning to Move Moving to Learn*”.

Patent in collaboration with Rutgers’ Prof. Elizabeth Torres “*Methods for the Diagnosis and Treatment of Neurodevelopmental and Neurodegenerative Disorders*” Awarded, January, 8<sup>th</sup>, 2019. (US 10,176,299 B2).

“Indiana University Johnson Center for Innovation and Translational Research” Translational Research Pilot Grant Program “*App development for extending the patent application for treatments of neurological and learning disorders*. May 26, 2016. \$14,726.

Advisor to 16 Ph.D. graduate students.

Research advisor to 14 postdoctoral fellows from Mexico, Canada, France, the Netherlands, Poland, and the US.

Referee of 30 professional national and international journals

Proposal reviewer for NSF, NIH, DOE, DOD, PRF

Scientific advisor for the National Council on Research and Engineering (Conacyt), Mexico, 1986-1988

Reviewer for the National Academy of Sciences Technical Reports (USA) 2013-~300 invited talks, 24 countries

Fluent in three languages (English, Spanish, French) and conversant in another three (Italian, Dutch, some Mandarin).

Member of the *Conte* ad-hoc NIMH review Panel 2004-2005

Phi Beta Delta Medallion, Honor Society for International Scholars, Alpha Nu Chapter, Northeastern University, 1998

Several Professional Committee Activities

Taught 24 different undergraduate and graduate physics and biophysics courses  
Several university Committees and Service Activities  
Director and Founder, Center for Interdisciplinary Research on Complex Systems  
(CIRCS) at Northeastern University 1995-2005

### **Conference Organizer**

Co-organizer of Workshop on “Topological Phase transitions and new developments”  
with Prof. M. Kosterlitz (2016 Nobel Laureate in Physics), Prof. L. Brink (former  
Chair of Nobel Physics Committee), Prof. M. Gunn (University of Birmingham) and  
Prof. K. K. Phua, Institute for Advance Studies, Singapore. June 2017  
Co-organizer of “Quantum Manifestations of Classical Chaos”. Theoretical Physics  
Institute, University of Minnesota, 1988.  
“Fourth Workshop in Condensed Matter Physics” Universidad Católica de Chile,  
January 3-7, 1994. Financed by the NSF  
“First Canadian-American-Mexican Physics Societies Meeting” Cancun, Mexico,  
1994.

### **Journal refereeing activities**

Physical Review Letters, Physical Review B, Physical Review E, Physica  
Journal de Physique (Paris), Physics Letters A (The Netherlands). European  
Physics Journal Letters.

Proceedings of the National Academy of Sciences, Proceedings of the Royal  
Society. Neurocomputing, Neural Computation, Journal of Mathematical  
Biology, Journal of Cell Science, Biological Cybernetics.

American Journal of Physics (education)

### **Federal Agencies**

National Science Foundation, Department of Energy, National Institute of  
Health, DoD,

CONICYT (National Science Foundation) of Chile, DGICYT (National  
Science Foundation) of Spain, CONACYT (National Science Foundation) of  
Mexico, National Agency for the Development of Science and Technology,  
Argentina, Petroleum Research Fund.

### **Selected Advisory Committees and Boards**

Co-Chair Orthoworx (orthopedics) Research & Development Council 2014-2015  
Co-Chair, with the VP for IT and the Dean of the Libraries for the Indiana University  
Bicentennial *Digitization Media Preservation Initiative* 2013-2015  
IU Member Rep. in Association of Universities for Research in Astronomy (AURA)  
2010-2015  
Member of the Research Executive Committee of the Association of Public and Land  
Grant Universities (APLU) 2007-2015

Member of the Executive Committee of APLU International Programs	2010-2015
Council Member of the Oak Ridge Associated Universities	2010-2015
Member Board of Directors IU Research Technology Commercialization	2010-2015
Member of Enterprise IU's Vice Presidents Risk Management Committee	2013-2015
IU's two Schools of Public Health Coordinating Council Committee	2010-2015
Member and overseer of the board of the Kinsey Institute	2010-2015
New York's State Grid Council Member	2007 –2010
Member Board of Directors: Calspan-University at Buffalo Research Center	2007-2010
Vice Chair, Nicholas Metropolis Award, Am. Phys. Society	2007-2009
The New York Academy of Sciences	2006–
Member representative of the Universities Research Association, Inc.	2005-2010
Board Member Great Lakes Consortium	2005–2010
Association of American Universities (AAU) Senior Research Officer	2005–2015
Board Member of the New York Structural Biology Center	2005–2010
Member of the External Advisor Board of the NSF-CREST “Center for Mesoscopic Modeling and Simulation” City University of New York.	2002–2007
Member of the selection committee of the American Physical Society minority Edward A. Bouchet Prize	2002–2004
National minority motivation Speaker, American Physical Society	1990-
Member of the New England Board of Higher Education Minority Mentor Program for under-represented students in science, technology, engineering and mathematics. 2001-2005	
Secretary-Treasurer, International Physics Group (now FORUM), American Physical Society	1990-1994
Local committee member, XVI Statistical Mechanics Conference, Boston	1986
Book reviewer for Physics Today and New Scientist	1986
Referee for NSF, DOE, NIH, DoD, Conicet (Argentina), Conycit, (Chile) Conacyt (Mexico) and DyiCyt (Spain).	
Advisor for Houghton Mifflin Publications for High School physics,	1987
NSF Mathematical Physics Review Panel	2006
NIH Conte Center Review Panel	2004-2005
NSF Biological Physics Review Panel	2004

## **Academic Research**

### **BOOKS**

**Topological Phase Transitions and New Developments** Conference Proceedings.  
 Edited by Prof. L. Brink, Prof. J. M. Kosterlitz (Nobel Prize), Prof. José, Prof. M. Gunn  
 and Prof. K. K. Phua. World Scientific, (September 2018).

**40 Years of Berezinskii-Kosterlitz-Thouless Theory**, José, Editor and contributor. Published by World Scientific (July 2013). Book published prior to the 2016 Nobel Physics Prize Award.

**Classical Mechanics: A Contemporary Approach** (with E. Saletan). Cambridge University Press, (670 pp), September 1998, 1999, 2002

## **PUBLICATIONS**

*~225 publications in the following areas of research:*

- *Phase Transitions and Critical Phenomena*
- *Quantum and Classical Josephson Junction Arrays*
- *Superconducting Gauge Spin Glasses*
- *Localization in Lower Dimensional Systems*
- *Quantum and Classical Chaos*
- *Nonlinear Dynamics, Solitons*
- *Cell Division Biology*
- *Neurodevelopment Disorders*
- *Neuroscience, Precisions Psychiatry,*

### **General Critical Phenomena**

José JV Duality, Gauge Symmetries, Renormalization Groups and the BKT Transition. International Journal of Modern Physics B. Vol. 30, No. 0 (**2016**) 173000. World Scientific Publishing Company.

José JV and Ramirez-Santiago G 1994 Critical exponents of the fully frustrated 2D-XY Model. In: Physical Review B49(14):9567

José JV and Ramirez-Santiago G 1992 Correlation functions of the fully frustrated 2D XY model. In: Physical Review Letter 68:1224

José JV 1978 Real space renormalization-group approach to a model of melting in two dimensions. In: Physical Review B18:6395

José JV, Kadanoff LP, Kirkpatrick S, and Nelson DR 1977 Renormalization, vortices, and symmetry-breaking perturbations in the two-dimensional planar model. In: Physical Review B16:1217

José JV 1976 Free energies in magnetic fields. Physical Review B14:2180

## **Quantum Josephson Junction Arrays**

José JV. "BKT Stability Against Disorder, External Magnetic Fields, Classical and Quantum Fluctuations and Quasi-Particle Tunneling Dissipation" in "Proceedings of Topological Phase Transitions and New Developments" Edited by L. Brink, M. Kosterlitz, J. Jose, M. Gunn and K. K. Phua. World Scientific, 2018.

José JV "Duality, Gauge Symmetries, Renormalization Groups and the BKT Transition". International Journal of Modern Physics B. Vol. 30, No. 0 173000 (2016).

José JV and Ramirez-Santiago G 2008 Reentrant quantum phase transitions in two capacitively coupled Josephson arrays in perpendicular magnetic fields. In: Physical Review B 77:064513

José JV and Ramirez-Santiago G 2004 Phase and charge reentrant phase transitions in two capacitively coupled Josephson arrays with ultra-small junctions. In: Physical Review B 70:174516

José JV and Kopec TK 2001 Capacitance-matrix and geometrical effects on the ground-state properties of quantum Josephson-junction arrays. In: Physical Review B 6305:064504

José JV and Kopec TK 2000 Three-dimensional Josephson-junction arrays in the quantum regime. In: Physical Review Letters 84:749-752

José JV and Kopec T 1999 Quantum critical point and scaling in a layered array of ultrasmall Josephson junctions. In: Physical Review 60(10):7473

José JV 1998 Quantum zero-point critical fluctuations in arrays of ultrasmall Josephson junctions, Computer simulation studies in condensed matter physics (Landau DP, Mon KK and Schötüttler H-B eds.) Springer Proceedings in Physics 83:115-132

José JV 1998 Duality in two capacitively coupled layered arrays of ultrasmall Josephson junctions. Invited paper to the special issue of J. Stat. Phys. in honor of the 60th birthday of Leo P. Kadanoff 93:943

José JV 1998 Phase transitions in arrays of ultrasmall two-dimensional Josephson junction arrays. (Giovannella C and Lambert c eds.) In: 1997 Euroschool, Siena, Italy, Superconductivity in Networks and Mesoscopic Structures. AIP, Thirteen pages (PRB)

José JV and Rojas C 1996 Critical properties of two-dimensional Josephson-junction arrays with zero-point quantum fluctuations. In Physical Review B 54(1):17, 12361

José JV, Kopec TK, and Rojas C 1996 Quantum phase diagrams in periodic and glassy arrays ultra-small Josephson junctions. (Cerdeira H and Shenoy SR eds.) In: Proceedings of the ICTP Workshop on Josephson Junction Arrays, Physical vol B222, 353

José JV and Kopec TK 1996 Quantum effects in a superconducting-glass model. In: Physical Review B52:16140

José JV and Rojas C 1994 Superconducting to normal state phase boundary in arrays of ultrasmall Josephson junctions. In: Physical B 203:481

José JV and Choi J 1991 Phase transitions in ultrasmall superconducting arrays. (Clark T ed.) In: Physical Review

José JV and Choi J 1989 reply in Physical Review Letters 63:1024

José JV and Choi 1989 Quasiparticle effects in quantum-induced transitions in superconductors. In: Physical Review Letters 62:1904

José JV and Jacobs L 1988 Transitions in lattice superconductors induced by quantum fluctuations. In: Physical B152:148

José JV, Goldman A, Jacobs L, and Novotny M 1988 New coherent states in periodic arrays of ultrasmall Josephson junctions. In: Physical Review B38:4562

José JV, Goldman A, Jacobs L, and Novotny M 1987 Evidence for a new ordered phase in a periodic array of ultrasmall Josephson junctions. In: Europhysics Letters 3:1295

José JV 1984 Effect of zero point fluctuations in the long-range phase coherence of granular films. In: Physical Review B29 (RC):2836

José JV, Jacobs L, and Novotny M 1984 Monte Carlo evidence for a reentrant transition in granular superconducting films. (Ekern et al eds) In: LTXVII, 737, Elsevier Publishers

José JV, Jacobs L, and Novotny M 1984 First order reentrant transition in granular superconducting films. In: Physical Review Letters 53:2177

### **Classical Josephson Junctions Arrays**

José JV, Hagens TJ, van Himbergen JE, and Tiesinga PHE (in preparation) Chaos induced coherent vortex motion.

Dominguez D, Wiecko C, and José JV 1999 Critical Current Enhancement due to an Electric Field in a Granular d-Wave Superconductor. In: Physical Review Letters, November

José JV and Sergeenkov A 1998 Analog of magneto-electric effect in high-Tc granular superconductors. In: Europhysics Letters 43:469



José JV 1998 Critical properties of classical Josephson junction arrays. (Giovannella C and Lambert C eds.) In: 1997 Euroschool, Siena, Italy, Superconductivity in Networks and Mesoscopic Structures, AIP, 15 pages

José JV, Gibbons F, and Góngora-T A 1998 Full Capacitance matrix effects in driven Josephson junction arrays. In: Physical Review B 58:982-994

José JV, Tiesinga P, and Hagenaaars T 1997  $1/f$  flux noise and dynamical critical properties of two-dimensional XY models. In: Physical Review Letters 78(3):519

José JV, Tiesinga P, Hagenaaars T, and van Himbergen J 1997 Single-vortex induced voltage steps in Josephson-junction arrays. In: Journal of Physics: Condensed Matter 9:1813

José JV, Lachenmaan SG, Huebener RP, Hagenaaars TJ, van Himbergen JE, Tiesinga P, and Doderer T 1997 Current-induced vortex dynamics in Josephson-junction arrays: Imaging experiments and model simulations. In: Physical Review B 56:5564

José JV and Ramirez-Santiago G 1996 Comment on 'Two phase transitions in the fully frustrated XY model.' In: Physical Review Letter 77(23):4849

José JV and Chu G 1996 Giant Shapiro steps in Diagonal arrays with screening. Submitted to Physical Review B

José JV and Dominguez D 1996 Magnetic and transport dc properties of inductive Josephson junction arrays. In: Physical Review B 53:17

José JV, Hagenaaars T, van Himbergen J, and Tiesinga P 1996 Vortex reflection at boundaries of Josephson-junction arrays. In: Physical Review B 53(5):2719

José JV, Hagenaaars TJ, van Himbergen JE, Lachenmann, and Tiesinga PHE 1995 Dynamics of d.c. current-induced vortices of inductive Josephson-junction arrays. In: Proceedings 1995 Frascati Conf. on Macroscopic Quantum Phenomena and Coherence in Superconducting Arrays, C. and, (World Scientific Singapore) p.329

José JV, Hagenaaars TJ, van Himbergen JE, Tiesinga PHE 1995 Nonlinear viscous vortex motion in driven-junction arrays. (Cerdeira HA et al eds.) In: Quantum Dynamics of Submicron Structures, volume 291 of NATO Advanced Studies Institute, Series E: Applied Sciences (Kluwer, Dordrecht, 1995), pp 617

José JV, Hagenaaars T, Tiesinga P, and van Himbergen J 1994 Nonlinear vortex motion in two -dimensional Josephson junction arrays. In: Physical Review B 50:1143

José JV and Domínguez D 1994 Non-equilibrium coherent vortex states and subharmonic giant Shapiro steps in Josephson junction arrays. In: Journal of Modern Physics B8:3749

José JV, Hagenaaars TJ, Tiesinga PHE, and van Himbergen JE 1994 Nonlinear viscous vortex motion in two-dimensional Josephson junction arrays. In: Physical Review B50:1143

José JV, Ramirez-Santiago-Santiago G, and van der Zant H 1994 Critical exponents of frustrated Josephson junction arrays (JJA). In: Physical B194-196:1671

José JV and Domínguez D 1993 Axisymmetric coherent vortex states in AC driven Josephson junction arrays. In: Proceedings of IV Workshop in Instabilities and Non-Equilibrium Structures Valparaíso, Chile

José JV and Chu G 1993 Giant Shapiro resonances in a flux-driven necklace of Josephson junctions. In: Physical Review B47 (RC):8365

José JV and Domínguez D 1993 Axisymmetric-coherent vortex states in current-driven Josephson junction arrays. In: Physical Review B48:13717

José JV, Domínguez D, and Chu G 1993 Collective locked-in states in DC+AC current and voltage driven Josephson junction circuits. (Kim D et al eds.) In: Proceedings of the 2nd CTP Workshop on Statistical Physics: KT transition and superconducting arrays, Min Eum Sa Publs.

José JV and Domínguez D 1992 Giant Shapiro steps with screening currents. In: Physical Review Letters 69:514

José JV, Domínguez D, Karma A, and Wiecko C 1991 Novel axisymmetric coherent vortex state in arrays of Josephson junctions far from equilibrium. In: Physical Review Letters 67:2367

José JV 1989 Phase-Transition in a Random Array of Josephson-Junctions – Reply. In: Physical Review Letters 63:1024

José JV 1979 Spin-spin correlation functions in the frustrated two-dimensional planar model. In: Physical Review B 20:21-67-2182

### **Spin Glasses and Gauge-Superconducting Glasses**

José JV and Ramirez-Santiago G 1993 Existence of two dissipation peaks in a superconducting glass model. In: Journal of Physics A Letters 26: L535

José JV 1991 Metastable magnetic properties of a superconducting glass model. (Nicolosky R ed.) In: International Conference on Transport Properties of Superconductors, World Scientific Publications 224

José JV and Choi J 1989 Theoretical studies of a superconducting-glass model. In: Physical Review Letters 62:320

José JV 1988 Metastability properties of gauge glasses and their relevance to high temperature superconductors. (Heiras J et al eds.) World Scientific Publications

José JV 1981 Quenched randomness in the two-dimensional ferromagnetic planar model. In: Physical Review Letters 46:1591, *ibid.* 47:1419

José JV, Kirkpatrick S, and Kawabata C 1981 Monte Carlo studies of  $+$ ,  $-J$  spin-glasses with continuous symmetries in  $D=2$ . In: Journal of Physics C14:L633

José JV 1981 Effects of disorder in the Kosterlitz-Thouless phase transition. In: Proceedings LXXVI, Physical B 107:493

José JV 1980 Spin-spin correlation functions calculations in the frustrated two-dimensional planar model. In: Physical Review B20:2167

José JV 1978 Finite susceptibility phase in the disordered two-dimensional X-Y model. In: Journal de Physique (Paris), Coll. C6 (suppl. 8):749

José JV 1978 Frustration effects on the two-dimensional planar model at low temperatures. (Nagaoka Y and Hikami S eds.) In: Proceedings of the 1979 Kyoto Summer Institute, Lecture Notes

### **Localization in Lower Dimensional Systems**

José JV, Cota E, and Rojas F 1993 Electronic transmission through time-periodic oscillating barrier. In: Journal of Nanostructured Materials 3:349-357

José JV, Cota E, and Monsivais G 1992 Resonant tunneling through a nonlinear electrified chain. In: Journal of Physics A Letters A25:L57

José JV, Domínguez D, and Wiecko C 1992 Wave function and resistance scaling for quadratic irrationals in Harper's equation. In: Physical Review B45:13919

José JV and Choi J 1987 Correlation effects in  $s=1/2$  random-exchange Heisenberg antiferromagnetic. In: Physical Review B35 (RC):419

José JV 1986 Static and dynamic properties of random exchange ( $S=1/2$ ) Heisenberg chains. (Falicov L et al eds.) In: Proceedings International workshop on the magnetic properties of low dimensional systems 164, Springer-Verlag

José JV, Monsivais G, and Flores J 1985 Study of Stark-ladder resonances in random chains in a constant electric field. In: Physical Review B31(RC):6906

José JV and Monsivais G 1984 Stark-ladder resonances in disordered chains. (Ekern et al eds.) In: LXXVII, 1357, Elsevier Publishers

José JV, Flores J, and Monsivais G 1983 Statistical properties of disordered 1-D models in a field. In: Journal of Physics C16:L103

José JV 1983 Ergodicity and density of states in a 1-D crystal. In: Journal of Physics A16:L205

José JV, Economou EN, Sheng P, and Soukoulis C 1983 Localization in one-dimensional disordered systems in the presence of an electric field. In: Physical Review Letters 50:764

José JV, Mehl M, and Sokoloff J 1982 Remnant magnetization in a random antiferromagnetic Ising chain. In: Physical Review B25(RC):2026

José JV, Mehl M, and Sokoloff J 1982 Static and dynamic properties of one-dimensional disordered magnetic Ising systems. In: Physical Review B27:334

José JV and Sokoloff JB 1982 Localization in an almost periodically modulated array of potential barriers. In: Physical Review Letters 49:334, *ibid* 49:700

José JV 1982 Aperiodic and disordered electronic 1-D systems: renormalization group approach. (Gomez B et al eds.) In: Proceedings XIX Latin American School of Physics, Cali, Colombia, World Scientific Publishing

José JV, Mehl M, and Sokoloff JB 1981 Metastable states in the random antiferromagnetic Ising chain. In: Proc. LTXVI, Physics B 108:493

José JV 1980 Universality in quantum magnetic chains. (Schneider T and Bernasconi J eds.) In: Proceedings of the International Conference on 1-D Systems, Friburg, Switzerland, Springer Verlag, August

José JV and Hirsch J 1980 Low temperature thermodynamic properties of random Heisenberg antiferromagnetic chains ( $S=1/2$ ). In: Journal of Physics C13:L53

José JV and Sahni P 1980 Thermodynamic and static properties of the one-dimensional XY model with symmetry breaking field. In: Physical Review B21:5381

José JV and Hirsch J 1980 Singular thermodynamic properties of random magnetic chains. In: Physical Review B22: 5339.

## **Quantum Chaos**

José JV, Gongora A, and Schaffner S 2002 Classical solutions of an electron in magnetized wedge billiards. In: Physical Review E 66:047201

José JV and Antillon A 2002 Dynamic control of an embedded cavity resonator. In: Optics-Communications 208:145-153

José JV, Gongora-T A, Schaffner S, and Tiesinga PHE 2000 Quantum and classical solutions for a free particle in wedge billiards. In: Physics Letters A 274:117-122

José JV, Badrinarayanan R, and Góngora-T A 1999 Pauli principle and chaos in a magnetized disk. In: Physical Review E60:1599

José JV and Mateos JL 1998 Energy transfer of a chaotic particle in a classical oscillating potential barrier. In: Physical A257 1/4:434

José JV, Antillon A, and Seligman TH 1998 Free particle chaotic scattering off two oscillating disks. In: Physical Review E58:178

José JV and Badrinarayanan R 1996 Classical and quantum chaos in a quantum dot in time-periodic magnetic fields. In: Physical Review E 54(3):2419

José JV and Badrinarayanan R 1995 Spectral properties of a Fermi accelerating disk. (Casati G and Chirikov B eds.) In: Quantum Chaos, 589, Cambridge University Press

José JV, Badrinarayanan R, and Chu G 1995 Quantum manifestations of classical chaos in a Fermi accelerating disk. In: Physical D83:1

José JV and Chu G 1992 The semi classical limit of a quantum Fermi accelerator. In: Journal of Statistical Physics 68:153

José JV 1991 Quasi energy eigenvalues and eigenfunctions of time-dependent periodic Hamiltonians Quantum Chaos. (Cerderia H and Ramaswamy R eds.) In: World Scientific Publications

José JV 1988 Quantum manifestations of classical chaos: statistics of spectra. (Hao Bai-Lin ed.) In: Recent Trends in Chaos, World Scientific Publications 2:149

José JV and Cordery R 1986 Study of a quantum Fermi-acceleration model. In: Physical Review Letters 56:290

José JV 1986 From localized to extended states in a time-dependent quantum model. (Seligman T et al eds.) In: Proceedings II International Conference on Quantum Chaos, Springer-Verlag 229

### **General Topics in Physics**

José JV 1989 Book review: One-Dimensional Conductors by S. Kagoshima et. al. In: Physics Today, June

José JV, Cota E, and Monsivais G 1987 Stark ladder resonances in ordered and disordered electrified chains. In: Physical Review B35:8929

José JV 1987 Vacuum fluctuations and their possible consequences in condensed matter physics. In: Ciencia (Journal of the Mexican Academy of Sciences) 38:193 (in Spanish)

José JV, Azbel MY and Cota E 1985 Delocalization transition in random electrified chain with arbitrary potentials. In: Physical Review B32:6157

José JV and Carreau M 1994 Novel A-B type oscillations in a 2-D electron gas in homogenous magnetic fields. In: Journal of Physics A27:L489

José JV, Rojas C, and Saletan E 1992 Elastic particle scattering from two hard disks. In: American Journal of Physics 60:587

José JV 1991 Quantum reflection coefficients in a condensed matter interface. In: Revista Mexicana de Fisica 37, Suplemento 1, S100-S116

José JV 1991 Book Review, Classical and Quantum Chaos by M. Gutzwiller. In: Physics Today, November

José JV and Sahni P 1979 Duality, solitons and dilute gas approximation in the one-dimensional X-Y model in symmetry-breaking fields. In: Physical Review Letters 43:78

José JV 1976 Sine-Gordon and classical 2-dimensional X-Y models. In: Physical Review D14:2826

### **Publications in Neuroscience, Precision Psychiatry, Neurodevelopment**

Di Wu, Jorge V. José, John I. Nurnberger and Elizabeth B. Torres (2018) “A Biomarker Characterizing Neurodevelopment with application in Autism” Scientific Reports-Nature. <http://rdcu.be/Ez9f>. **Ranked Top 100 publication out of 1627 papers** published in neuroscience in SR (Nature) in 2018.

Di Wu, Elizabeth B. Torres, Jorge V. José (2018) “Micromovements: The s-Spikes as a Way to ‘Zoom In’ the Motor Trajectories of Natural Goal-Directed Behaviors” In *Autism: The Movement Sensing Perspective, Edition: Neuroscience Series* (pp.221-227). CRC Press Taylor and Francis. Torres EB and Whyatt CP (Eds.)

José JV, (2018) "Non-Gaussian Statistical Distributions Arising in Large Scale Personalized Neurological Data Sets" Book Chapter” In *Autism: The Movement Sensing Perspective, Edition: Neuroscience Series* (pp.155-164). CRC Press Taylor and Francis. Torres EB and Whyatt CP (Eds.)

José JV, "Non-Gaussian Statistical Distributions Arising in Large Scale Personalized Neurological Data Sets" Book Chapter "Autism: The Movement Sensing Approach" by CRC Press Taylor and Francis Group, Torres EB and Wyatt CP (Eds.) (2018)

Wu D, Torres EB., José JV, "Micro-Movements: The s-Spikes as a way to zoom-in the motor trajectories of natural goal-directed behaviors" Book Chapter "Autism: The Movement Sensing Approach" by CRC Press Taylor and Francis Group, Torres EB and Whyatt CP (Eds.) (2018)

Di Wu, Elizabeth B. orres, Jill Nguyen, Sejal Mistry, A. Kolevzon, Jorge V. José. "Gait kinematics analyses provide information about Autism". (to be submitted)

Di Wu, Elizabeth B. Torres, Jill Nguyen, Sejal Mistry, Jorge V. José "Computational Psychiatry Modelling leads to an Empirically Derived Biomarker in an ASD Clinical Trial". (to be submitted)

Di Wu, Lisa Goffman, Lakin Brown, Allison Gladfelter, Jorge V. José "A Quantitative Analysis of Speech Kinematics During Word Learning in Children with Autism". (to be submitted)

Torres EB, José JV, et al. "Towards Precision Psychiatry: Statistical Platform for the Personalized Characterization of Natural Behaviors" *Frontiers in Neurology*, February 2016, Volume 7, Article 8.

José JV, Torres EB, Isenhower RW, Yanovich P, Stigler KA, and Nurnberger JI 2013 Gender Differences in Autism. *The Journal of Neurophysiology*, 110: 1646-1662.

José JV, Torres EB, Brincker M, Isenhower RW, Yanovich P, Stigler KA, Nurnberger JI, and Metaxas D 2013 The Micro-Movement Perspective In: *Autism: Frontiers in Integrative Neuroscience*, Volume 7, Article 32.  
<https://www.frontiersin.org/articles/10.3389/fnint.2013.00032/full>

Hong SL, Eisenhower RW, José JV, and Torres EB 2013 Cognitive load results in motor overflow in essential tremor. In: *Neurocase* Aug;20(4): 397-406

### **Recent Invited Talks at Congresses and Universities (out of over 230)**

2021 "Biomarcadores cinemáticos estadísticos caracterizando déficits en el desarrollo neuronal" ("Statistical kinematic biomarkers characterizing neural development") 15<sup>th</sup> January (2021). National Metropolitan University of Mexico.

2020 "Statistical Analysis of Human Motions Unravels Biomarkers Describing Neurodevelopment in Compromised Nervous Systems". Denver, March Meeting, American Physical Society, March 5<sup>th</sup>.

2018 “How the Kinematic Statistical Properties of Human Motions, Measured at Millisecond Time Scales, Can Reveal Elements of their Cognitive Abilities” Colloquium at Physics Department, SUNY at Buffalo. October 18<sup>th</sup>.

2018 “Motion Biomarkers in Neurodevelopment: Independently Confirmed by Clinical Diagnoses” Institute of Neuroscience, Chinese Academy of Sciences, Shanghai, July 10<sup>th</sup>

2018 “Motion Biomarkers describing neurodevelopment” Theoretical Physics Institute, Chinese Academy of Sciences, Beijing, June 20<sup>th</sup>

2018 “A personal view about the Kosterlitz-Thouless 2016 Nobel Physics Prize”. Theoretical Physics Institute, Chinese Academy of Sciences, Beijing, June 12<sup>th</sup>

2018, “Basic and practical questions about, refraction, diffraction and interference in multi slit chaotic and non-chaotic configurations” Electrical Engineering, SUNY at Buffalo, March, 22<sup>nd</sup>.

2017 “Precision and Computational Psychiatry in Neurodevelopment”. *17<sup>th</sup> International Conference on Complex Systems*. Invited talk. September 17-22, Cancun, Mexico. 2017

2017 “Theoretical Physics Developments After 1974 and Their Consequences for the Kosterlitz-Thouless Theory ”. Workshop on Topological Phase Transition and New Developments. Institute for Advanced Studies, Nanyang University, Singapore 7-5-17

2016 “On how the Statistical Properties of Human Motions, Looked at Millisecond Time Scales, Can Reveal Quantitative Autism Biomarkers”. Stark Neuroscience Institute. Indiana University Medical School. October 27<sup>th</sup>.

2016 “A personal view about the reasons why Kosterlitz and Thouless shared the 2016 Nobel Physics Prize”. The Joseph and Sophia Konopinski Colloquium Series. Indiana University, Bloomington. October 12<sup>th</sup>.

2016 “How studying the kinematics of how we move can unravel important physiological information, leading to quantitative classifications of neurological disorders” Peking University, Beijing, June 13<sup>th</sup>.

2016 “A personal perspective about the 21st Century Challenges to understanding how the brain works typically or when affected by neurological disorders”. Public Lecture at Indiana University Beijing, China Gateway Office. June 6.

2016 “Micro-movement statistics biomarkers may help diagnose and develop therapies for individuals with compromised nervous systems”. Institute of Neuroscience, Shanghai Institute for the Biological Sciences, Chinese Academy of Sciences, Shanghai, May 23<sup>rd</sup>.



2016 “How the Statistical Properties of Human Motions Reveal the Inner Workings of the Central Nervous System”. Key Laboratory of Theoretical Physics, Chinese Academy of Sciences, May 13<sup>th</sup>.

2016 “From neurons to behavior: e.g. from the problem of “paying attention” to the “swimming” patterns of larvae zebra fish”. Key Laboratory of Theoretical Physics, Chinese Academy of Sciences, May 6<sup>th</sup>.

2016 “How the Statistical Properties of Human Motions Reveal Cognitive Developmental Biomarkers: e.g. the Autism example”. Beijing Normal University, May 4<sup>th</sup>.

2016 “A personal Perspective on Theoretical and Computational Neuroscience: Past, Present and Possible 21st Century future”: Inaugural lecture, Key Laboratory of Theoretical Physics, Chinese Academy of Sciences, April 29<sup>th</sup>.

2016 “Micro-movement statistics biomarkers may help diagnose and develop therapies for individuals with Autism Spectrum Disorders”. Institute for Neural Computation Chalk Talk Series: University of California, San Diego. March 3<sup>rd</sup>.

2016 “How the statistical properties of human movements can lead to quantitative biomarkers characterizing neurological disorders”; University of California, Santa Barbara, March 2<sup>nd</sup>.

2016 “Micro-movement statistics biomarkers may help diagnose and develop therapies for individuals with compromised nervous systems”; Salk Institute for the Biological Sciences, La Jolla, California, February 8<sup>th</sup>.

2016 “Micro-movement statistics biomarkers may help diagnose and develop therapies for individuals with compromised nervous systems" February 8, 2016

2015 “New Millisecond Movement Biomarkers to Study and Analyze Individuals with Compromised Nervous Systems”; Center for Interdisciplinary Research on Complex Systems, Northeastern University, September 22<sup>nd</sup>.

2015 “New Millisecond Movement Biomarkers to Study and Analyze Individuals with Compromised Nervous Systems” Center for Interdisciplinary Research on Complex Systems, Northeastern University, September 22.

2015 “Peripheral Nervous System Approach to Pain” Joint Meeting at Indiana University School of Medicine with Eli Lilly, June 12, 2015.

2015 “Human movements as a kinesthetic percept leading to millisecond biomarkers with potential uses in neurological disorders” Konopinsky Distinguish Lecture, Physics Department, Indiana University, Bloomington, February 18<sup>th</sup>, 2015

2015 “Peripheral Nervous System Approach to Pain” Joint Meeting at Indiana University School of Medicine with Eli Lilly pharmaceuticals, June 12.

2015 “Human movements as a kinesthetic percept leading to millisecond biomarkers with potential uses in neurological disorders” Konopinsky Distinguish Lecture, Physics Department, Indiana University, Bloomington, February 18<sup>th</sup>, 2015

2014 “New Biomarkers to diagnose and develop therapies for individuals with compromised nervous systems” Elli Lilly Ground Rounds Lecture, 7-30-2014

2014 “New Biomarkers to diagnose and develop therapies for individuals with compromised nervous systems” Elli Lilly Ground Rounds Lecture, 7-30-2014

2011 “Statistical classification tools for spectral disorders based on motor variability: Application to autism and Parkinson’s disorders” (With R. W. Isenhower and E. B. Torres) Society of Neuroscience Annual meeting, Nanosymposium

2010 “Non-equilibrium biophysical model of self-organized in-vitro spindle formation” 104th Statistical Mechanics Conference, Rutgers University

2010 “Directional and temporal selectivity in motor cortex” Society of Neuroscience meeting at San Diego, California

2010 “Directional and temporal selectivity in motor cortex” Max Planck Institute at Göttingen

2009 “Non-equilibrium biophysical model of self-organized spindle formation” Laboratoire De Physique Theorique et Modèles Statistiques (LPTMS). Orsay, France

2009 “Biophysical Model describing the formation of the Mitotic Spindle” X National Summer School of Molecular Biophysics. Hermosillo, Sonora, Mexico

2009 “Non-equilibrium thermodynamic effects during cell division” Invited talk. American Physical Society, Pittsburgh. Presented in the Symposium “Statistical Physics in Biology”

2008 “Reentrant Classical and Quantum Dynamics in magnetized Pac-man billiards” International Workshop on Random Matrix Theory and Applications: From Number Theory to Mesoscopic Physics. Orsay, France

2008 "Numerical Modeling Exhibits the Importance of Microtubule Bundle

Formation in the Self-Organized Development of Spindle Poles" Biophysical Society 52nd Annual Meeting. Long Beach Convention Center, Long Beach California

2007 "A theoretical neural model describing the problem of Paying Attention" Plenary Talk, at an international Symposium on Biological Physics in Mexico

2006 "Lectures on Mitotic Cellular Division without Chromosomes" Colegio Nacional, Mexico City

2006 "The Physics of Cellular Division" ISSCultArt, Colegio Nacional. Merida, Yucatan, Mexico

2006 "A Model of Stimulus Competition and Selective Visual Attention in Area V4" XXVIII Symposium International Computational Neuroscience Computationnelle. Montreal, Canada

2005 "Synchronicity and the Problem of Visual Attention," presented at Rockefeller University Center for Studies in Physics and Biology seminar, New York City, New York

2004 Department "Neurokinematic model of larva zebra fish swimming" Presented in the Workshop "Understanding the Brain" at the Kavli Theoretical Institute at the University of California, Santa Barbara

2004 "Synchrony and Information Theory" Invited talk. Workshop "Reduced models of Neuronal Excitability and Dynamics of Spike-generation" Baltimore, Maryland

2004 "Neuro-kinematic modeling of complex swimming of larval zebrafish," Talk . "2004 Computational Neuroscience Meeting" held in Baltimore, Maryland

2004 "Synchronous neuronal spiking: The problem of Paying Attention". 7th International Symposium on Statistical Physics (StatPhys-Taiwan 2004). Academia Sinica, Taipei, Taiwan

2004 "2004 Manuel Sandoval-Vallarta Lectures". The Award entailed 6 two-hour lectures that ranged from Quantum Chaos, Quantum Computing, as well as modeling cell division (mitosis), and the problem of "Attention" in neuroscience. Metropolitan Autonomous University, Mexico City

2004 "Motors and a Physical Model of the Mitotic Spindle" Invited Talk. American Physical Society meeting, Montreal, Canada. Presented in the Symposium "Molecular Motors and the Physics of Cell Division"

2003 "Effects of synaptic noise in the workings of the brain: The problem of attention". Invited Plenary Talk. International Conference on Noise and Fluctuations, Prague, Czech Republic

2002 "Classical and quantum solutions of an electron in magnetized Pac-Man billiards: Reentrant phenomena" Invited Topical Talk. 87th Annual Meeting of the Argentine Physical Association that took place in Huerta Grande (Cordoba, Argentina)

2002 "Driven by inhibitions: The attention problem" Invited Plenary Talk. "87th Annual Meeting of the Argentine Physical Association in Huerta Grande (Córdoba, Argentina)

2002 "Classical and quantum solutions of an electron in magnetized Pac-Man billiards: Reentrant phenomena" Invited Topical Talk. 87th Annual Meeting of the Argentine Physical Association in Huerta Grande (Cordoba, Argentina)

2002 "Driven by inhibition: The attention paradigm" Invited talk. Third international conference on Unsolved Problems of Noise and fluctuations in physics, biology, and high technology (UPoN'2002) held at NIH campus

2002 "Information theory and neural processing" Invited talk. Workshop on interdisciplinary Non-extensive statistical mechanics, Santa Fe Institute for complex system. Santa Fe, New Mexico

2001 "Modeling Transport by molecular motors and their role in cellular mitosis" Invited talk. Nanobiology 2001, Emory University, Atlanta, Georgia

2001 "The great illusion: Thirty years of knowing J. Flores" National University of Mexico, Mexico City, Mexico

2001 "Self-organization in cellular division" VI Symposium on Condensed Matter Physics Ensenada, Baja California, Mexico

2000 "Quantum Critical Points in 2-D and 3-D arrays in ultra-small Josephson Junction Arrays" CMT24 Conference, Buenos Aires, Argentina.