

JORGE V. JOSÉ

Present Position: James H. Rudy Distinguished 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

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

Academic Positions

Chinese Academy of Sciences, President's International Fellowship Initiative, Beijing; China	5-8-2018
Chinese Academy of Sciences, President's International Fellowship Initiative, 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 st James Franck Fellow, James-Franck Institute, University of Chicago	1977-1979
Assistant Research Professor, Brown University	1976-1977
Research Associate, Brown University	1974-1976

Honors/Awards

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-
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

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 st James Franck Fellow, James-Franck Institute, University of Chicago	1977 - 1979
Assistant Research Professor, Rutgers University	1979 - 1980
*UNAM= National University of Mexico	

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-

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.
- 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 (2016-2019). Title “*Learning to Move Moving to Learn*”.
- Patent application “*Methods for the Diagnosis and Treatment of Neurodevelopmental and Neurodegenerative Disorders*” (RU Docket #2012-051) Published under United States Publication No. 2014/0336539.
- “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 12 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 20 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

Administrative service to Northeastern University, SUNY at Buffalo and Indiana University are included at the end of this academic CV

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	2013-

BOOKS

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

40 Years of Berezinskii-Kosterlitz-Thouless Theory, Editor and contributor. Published by World Scientific (July 2013).

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

~200 publications in the following areas of research:

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

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
- “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).
- 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 Invited Talks at Congresses and Conferences

- 2017 “Precision and Computational Psychiatry in Neurodevelopment”. 17th *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
- 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 Models 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
- 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
- 2000 "Some memories of my last 24 years of visiting and doing research collaborations in Mexico" Inaugural lecture as a Foreign Member of the Mexican Academy of Sciences, Mexico City, Mexico
- 1999 "Quantum Critical Points and scaling in layered array of mesoscopic Josephson junctions in the zero-temperature limit" Solid State Latin American Symposium, Cartagena, Colombia
- 1999 "Driven by inhibition" Computational Neuroscience Conference, Pittsburgh, Pennsylvania
- 1998 "Duality and Quantum Chaos in Pac Man and Sector Dot Billiards" Academic year on Symmetries at The International Center for Sciences, University of Mexico, Cuernavaca, Morelos, Mexico
- 1998 "Driven by inhibition" 1999 Neuroengineering and Mathematical Neuroscience, Jan 15th-18th 1999, University of Arizona. Also: International Conference on Complex Systems Nashua, NH.
- 1998 "Duality in Two Capacitively Coupled Layered Arrays of Ultrasmall Josephson Junctions" Allen Goldman's 60th Birthday Conference, University of Minnesota
- 1997 "Critical properties of classical Josephson junction arrays". Euroschool, Superconductivity in Networks and Mesoscopic Structures, Siena, Italy
- 1997 "Phase transitions in arrays of ultra-small two-dimensional Josephson junction arrays" 1997 Euro school in Superconductivity in Networks and Mesoscopic Structures, Siena, Italy
- 1997 "Quantum chaos in N-electron quantum dot systems" Quantum Chaos Workshop Center for Science Investigation, Cuernavaca, Morelos, Mexico
- 1997 "Quantum Chaos in Quantum Dots in Time Periodic Magnetic Fields". "Workshop on Classical Orbits and Interferences in Designer Atoms," Harvard Smithsonian Center for Astrophysics
- 1997 "Zero-point quantum fluctuations and critical properties of two-dimensional XY model" Invited talk. 10th conference on Recent Developments in Computer Studies of Condensed Matter Physics, Center for Computational Physics, University of Georgia

- 1995 “Mini-workshop on Josephson junction arrays” International Center for Theoretical Physics, Trieste, Italy
- 1995 “Dynamics of DC current induced vortices, macroscopic quantum phenomena and coherence in superconductors” Villa Tuscolana, Italy
- 1994 “Quantum fluctuations induced phase transitions in arrays of ultra-small Josephson junction arrays” Workshop on vortex phases. Theoretical Physics Institute, University of California, Santa Barbara
- 1994 “Existence of two dissipation peaks in a superconducting glass model” Workshop on vortex phases Theoretical Physics Institute, University of California, Santa Barbara
- 1994 “Critical properties of fully frustrated 2-D XY model” Canadian-American Mexican 1994 Conference, Cancún, México
- 1994 “The quantum manifestations of classical chaos” Eisen-Moshinsky Lecturer, University of Mexico, public lecture
- 1994 “Quantum fluctuations induced phase transitions in arrays of ultra small Josephson junctions’ arrays” NATO Conference on Mesoscopic Superconductivity. Karlsruhe, Germany
- 1994 “Quantum chaos in a quantum dot” Los Alamos National Laboratory Conference on Quantum Complexity in mesoscopic systems
- 1994 “Quantum fluctuations induced phase transitions in arrays of ultra small Josephson junction arrays” Fourth International Conference on Solid State Physics, Santiago, Chile
- 1993 “The pervasive presence of chaos in nature” Robert D. Klein Lecturer, Northeastern University, public lecture
- 1993 “Axisymmetric coherent vortex states in AC driven Josephson junction arrays” IV Workshop in Instabilities and Non-Equilibrium Structures, Valparaíso, Chile
- 1993 “The CTP workshop on Statistical Physics: KT transition and superconducting arrays” Seoul, Korea
- 1992 “Quantum manifestations of classical chaos” Escuela Latino Americana de Fisica (ELAF) Summer school, Mexico
- 1992 “Quantum fluctuation effects in arrays of ultra small Josephson junctions” Institute for Theoretical Physics, Santa Barbara, California

- 1992 “Axisymmetric coherent vortex state in driven Josephson junction arrays” Indianapolis, March APS meeting
- 1991 “Super conducting Glass models and their relevance to high T_c: Forum on High Temperature Superconductivity” Florence, Italy
- 1990 “Quantum signatures of classical chaos: Spectral statistics” Annual national meeting of the Mexican Physical Society, held in Ensenada B.C., Mexico
- 1990 “Phase transitions in ultrasmall superconducting arrays” Workshop on Macroscopic Quantum Phenomena, University of Sussex, Satellite conference to the LT-19
- 1990 “Statistical mechanics of randomly frustrated superconductors” Taiwan workshop on chaos and critical phenomena, held in Taipei, Taiwan
- 1990 “Quantum manifestations of classical chaos in time periodic Hamiltonian” Adriatico Summer program on Quantum Problems. Conference on Quantum Chaos and Quantum Fluctuations, International Center for Theoretical Physics (ICTP) Trieste, Italy
- 1990 “Metastable magnetic properties of a superconducting glass model” The International Conference on Transport Properties of Superconductors, Rio de Janeiro, Brazil
- 1989 “Spectral Properties of Time-Periodic Hamiltonians” Workshop on Chaos and Quantum Mechanics Institute for Theoretical Physics, Santa Barbara, California
- 1989 “On the Quantum signatures of Classical Chaos” Workshop on Chaos and Quantum Mechanics New England Section of the American Physical Society
- 1988 “Metastability Properties of Gauge Glasses and their Relevance to High Temperature Superconductors” IX Winter Meeting on Low Temperature Physics: High Temperature Superconductors, Morelos, Mexico
- 1987 “Transitions in Lattice Superconductors Induced by Quantum Fluctuations” NATO Advanced Research Workshop on Coherence in Superconducting Networks. Delft, the Netherlands
- 1987 “Quantum Signatures of Classical Chaos” Beijing Summer School on Chaos, Beijing, China
- 1987 “Propriétés spectrales quantique de modèles chaotique classiques” Journées D’Etudes de Physique Théorique at Université de Paris at Orsay

- 1986 “Phase transitions induced by quantum fluctuations” APS March Meeting, Las Vegas, Nevada
- 1986 “Physics of low-dimensional magnetic systems” Taxco, Gro., Mexico
- 1986 “II International Conference on Quantum Chaos” Cuernavaca, Mor., México
- 1985 “Workshop on Quantum Chaos” Columbia University, New York, USA
- 1985 “Latin American symposium on solid state physics” Mar del Plata, Argentina
- 1982 “Stochastic Processes in Physics” Latin American School of Physics, Cali, Columbia
- 1979 “Physics in low-dimensional systems” Kyoto Summer Institute, Japan

Partial List of Invited Lecture Presentations at Universities & Labs

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

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

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

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

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 27th.

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 12th.

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 13th.

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 23rd.

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 13th.

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 6th.

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

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 29th.

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 3rd.

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

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 8th.

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

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.

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 18th, 2015

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

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 18th, 2015

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

2010 “Issues in Systems Neuroscience: Motor Control and Paying Attention
Department of Cellular & Integrative Physiology, Indiana University School of Medicine. 2011

2006 “Biophysical Model of Self-Organized Spindle Formation Patterns” Department of Chemical & Biological Engineering, April 19, 2006.

2006 “Neuronal Synchronization as a Possible Mechanism for Attentional Modulation,”
Seminar for the Physiology and Biophysics Department, UB

2006 “Examples of Complex Behavior in Physics and Biological Physics Problems,”
Colloquium, Department of Physics, UB

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 “Molecular motors and the physics of cell division”. Physics department colloquium at University of North Carolina, Chapel Hill

2004 “Molecular motors and the physics of cell division”. Physics Department colloquium, Pennsylvania State University

2002 "Driven by inhibition and the problem of attention". The French government awarded me Fellowship as a "Chercheur etranger d'haut niveau ET de renommée internationale" Inaugural lecture delivered on October 29, at the Universite de Paris at Orsay, France

- 2001 "Quantum Chaos and the Pauli Exclusion Principle" Simon Frazer University, Vancouver, Canada
- 2001 "Modeling transport by molecular motors and their role in cellular mitosis" University of California San Diego
- 2001 "Entrainment by synchronized inhibition boosts information transfer in neocortical neurons" Theoretical Physics Institute, Neuroscience workshop, University of California Santa Barbara
- 2001 "Modeling Kinesin motility assays and mitosis without centrosomes and kinetochores" Colegio de Mexico, Mexico
- 2000 "Self organization in biological cellular systems" Clark University, Massachusetts
- 2000 "Optimal information transfer in synchronized neocortical neurons." Computational Neuroscience Meeting
- 2000 "Computational model of carbachol-induced delta, theta and gamma-like oscillations in hippocampus." Computational Neuroscience Meeting
- 2000 "Computational model of carbachol-induced delta, theta and gamma-like oscillations in hippocampus." Society for Neuroscience.
- 2000 "Entrainment by synchronized inhibition boosts information transfer in neocortical neurons." Abstracts Society for Neuroscience
- 1999 "Driven by inhibition" Computational Neuroscience Conference, Pittsburgh, Pennsylvania
- 1999 "Electric field effects in high Tc granular superconductor" Bariloche, Argentina
- 1999 "Driven by inhibition" Northeastern Neuroscience Seminar Series
- 1999 "Driven by inhibition" Neuroscience Conference Miami, Florida
- 1999 "Synchronous clusters in a noisy inhibitory neural network" Center for BioDynamics, Department of Biomedical Engineering, Boston University, Massachusetts
- 1998 "Self-organization during cell division" University of Massachusetts, Lowell
- 1998 "The pervasive presence of chaos in nature" Indiana State University
- 1998 "Self-organization during cell division" Brown University, Rhode Island, Colloquium

- 1998 "Synchronous clusters in a noisy inhibitory neural network" UNAM
- 1998 "Simple Physical models of Self-organization in Cell Biology" University of Massachusetts, Lowell
- 1998 "Simple Physical models of Self-organization in Cell Biology" Statistical Mechanics Meeting, Rutgers University, New Jersey
- 1998 "The pervasive presence of chaos in nature" North Carolina State University at Wilmington
- 1997 "Quantum Zero-point Critical Fluctuations in Arrays of Ultrasmall Josephson Junctions" Physics Department, Boston University, Massachusetts
- 1997 "Magneto Electric-like effect in high Tc Superconductors" Centro Atomico Bariloche, Argentina
- 1997 "Magnetic Flux Noise in Two-Dimensional Super Conducting Networks" Physics Institute, National University of Mexico, Mexico
- 1997 "Magnetic flux noise and criticality of two-dimensional dynamic XY models" Brown University, Rhode Island, Condensed Matter Seminar
- 1997 "Coherent vortex patterns in driven nonlinear coupled oscillators Colloquium" Washington Central University, Washington
- 1997 "The pervasive presence of chaos in nature" Bates College, Maine, Colloquium
- 1997 "Quantum manifestations of classical chaos" College of William and Mary, Virginia, Colloquium
- 1996 "Coherent vortex oscillations in driven Josephson junction arrays" Universidad de Zaragoza, Spain, Colloquium
- 1996 "Quantum manifestations of classical chaos" National University of Madrid Spain, Colloquium
- 1996 "Quantum chaos in quantum dots in time-periodic magnetic fields" University of Kansas at Lawrence, Colloquium
- 1995 "Coherent vortex oscillating patterns in driven Josephson Junction Circuits" University of Rhode Island, Colloquium
- 1994 "Vortex oscillating patterns in driven Josephson Junction Circuits" Karlsruhe, Germany, Colloquium

- 1994 “Quantum fluctuation induced phase transitions in arrays of ultra small Josephson Junctions arrays” Grenoble CRTBT, France
- 1994 “Quantum chaos in a quantum dot due to time varying magnetic fields” University of Maryland, seminar
- 1994 “Coherent vortex oscillating patterns in driven Josephson Junction Circuits” Physics Institute, University of Mexico, Mexico
- 1994 “Quantum chaos in a quantum dot due to time varying magnetic fields” Universite Paul Sabatier, Toulouse, France
- 1994 “Quantum fluctuation induced phase transitions in arrays of ultrasmall Josephson junction arrays” Theoretical Physics Institute, Utrecht, The Netherlands
- 1994 “Coherent vortex oscillating patterns in driven Josephson Junction Circuits” Neûchatel University, Switzerland
- 1994 “Quantum fluctuation induced phase transitions in arrays of ultrasmall Josephson junction arrays” Delft University, the Netherlands
- 1994 “Quantum chaos in a quantum dot due to time varying magnetic fields” University of Amsterdam, The Netherlands
- 1994 “Coherent vortex oscillating patterns in driven Josephson Junction Circuits” Warsaw University, Poland
- 1994 “Quantum chaos in a quantum dot due to time varying magnetic fields” Polish Academy of Sciences, Warsaw, Poland
- 1994 “Quantum fluctuations induced phase transitions in arrays of ultrasmall Josephson junction arrays” University of Florida
- 1993 “Galvanomagnetic oscillations in a 2-D electron gas in inhomogeneous magnetic fields” Delft University, The Netherlands
- 1993 “Quantum chaos in a quantum dot due to time varying magnetic fields” Theoretical Physics Institute, Utrecht, The Netherlands
- 1993 “Galvanomagnetic oscillations in a 2-D electron gas in inhomogeneous magnetic fields” Max Planck Institute, Heidelberg, Germany
- 1993 “Quantum Critical points and scaling in a layered array of mesoscopic Josephson junctions in the zero-temperature limit” Max Plank Institute, Stuttgart, Germany

PUBLICATIONS

Neuroscience, Neurodevelopment, Cell Biology

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>

Di Wu, Elizabeth B. Torres, Jorge V. José (2017) “*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.)

Di Wu, Elizabeth B. Torres, 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)

José JV, (2017) "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.)

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, "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.) (2017)

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.) (2017)

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ADMINISTRATIVE SERVICE

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- 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 (DMPI)*. 2013-2015
- IU Member representative in the 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
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- Vice Chair, Nicholas Metropolis Award, Am. Phys. Society 2007-2009
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- 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, in particularly African-Americans, Hispanics, and Native Americans 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 education, 1987
- NSF Mathematical Physics Review Panel 2006
- NIH Conte Center Review Panel 2004-2005
- NSF Biological Physics Review Panel 2004

Research Accomplishments as a VPR at Indiana University 2010-2015

- As a central goal of my administration I catalyzed and was very involved in developing and helping faculty to submit several multimillion dollar grants in different areas of IU strengths, as well as grants submitted to federal agencies, private firms and in public-private partnerships.
- Completed 2014 VPR bicentennial strategic plan for Indiana University (http://www.iu.edu/~vpr/strategic_plan.shtml).
- Involved in the IU Bicentennial Strategic Plan, in particular the initial developments of the *Grand Challenges Initiative* that has now been funded with 300 million dollars for the next 4 years.
- Member of the Academic Board for developing the “*Indiana Bioscience Research Institute*.” A private-public enterprise funded by Elli Lilly, Dow, Cook and the State of Indiana, plus the three State of Indiana Research Universities: IU, Purdue and Notre Dame.
- Promoted Indiana University’s membership in the consortium of several research universities with industries to compete for a five-year **Digital Manufacturing** grant. The grant was announced by President Obama on February 25, 2014. It included 70 million dollars from DoD and 250 million dollars’ match expected from industry and universities. The University of Illinois is the lead institution.
- Placed emphasis in increasing IU’s DoD funding by hiring a consultancy firm in Washington DC. IU was awarded a **T(rauma)B(rain)I(njury) NCAA-DoD** 30-million-dollar grant announced by President Obama on May 29, 2014. IU is the lead institution collaborating with the University of Michigan and the Medical School in Wisconsin.
- Catalyzed implementation of agreement between IU and The National Autonomous University of Mexico (UNAM) since 2010. An IU Gateway at UNAM is presently being considered.

- After joining IU, I spent considerable amount of time identifying new focal areas of IU research and scholarly strengths for special seed funding and development: For example, IU announced the formation of the **Consortium on Religion, Ethics and Society** (<http://news.indiana.edu/releases/iu/2014/01/consortium-on-religion-ethics-society.shtml>). On October 23rd, 2014, IU lunched a 7 million dollars **Indiana University Network Sciences Institute** (<http://news.iu.edu/releases/iu/2014/10/iuni-network-science-institute.shtml>), involving over 80 faculty from the two main research core campuses of IU.
- In 2010 started a 1Million/year **Indiana University Collaborative Interdisciplinary Research Grants** program targeted to new innovative and transformative projects. The return on investments to the first two years of funding was 63-1, and for the last 4 years 43-1.
- Reconfigured the “**New Frontiers**” 1Million/year Arts and Humanities seed funding program. Due to the success of this program, several NEH awards, the funding was extended till 2019.
- Federal funding 2011-15 increased by 16%.
- Facilitated relationships between researchers and affiliated institutions: e.g. Regenstrief Institute of Medical Informatics, Bio-Crossroads and the Indiana University Health Hospitals.
- Supervises and administered several university wide research Centers and Institutes and core instrumentation facilities.
- Started the VPR ***IN Focus*** Annual Report including material from all 8 IU campuses (<http://www.iu.edu/~vpr/communications.shtml>).

Administration and Compliance accomplishments as a VPR at IU

- First Research University to fully implement the pre-proposal Quali/Coeus (KC) open source tool, July, 2011. Deployment of post award KC component implemented end 2012, now included all the IU campuses.
- Completely reorganized the Human Subjects Office by hiring a new director and new staff. Believed to be one of the most efficient HSO offices in a major research university.
- Collaborating with VPIT developed new KC/IRB software protocol to further improve the HSO office. IU appeared to be the first large research institution to implement this open source tool. August 2013.
- Introduced policies to further reduce administrative burdens on research faculty
- Introduced a program APP to help faculty navigate all the administrative requirements by the federal agencies. Presently used by all departments of the College of Arts and Sciences, as well as the School of Science and Medicine at IUPUI.
- Managed research misconduct cases in collaboration with university counsel.
- Oversaw the successful first joint accreditation of the Bloomington and Indianapolis campuses by the Association for the Accreditation of Human Research Protection Programs (AAHRPP) 2011.
- Started process for the first application for accreditation by the Bloomington campus from the Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC). Awarded 9/1/13.

- Developed and got approval for the first university-wide Centers and Institutes policy
- Developed a university wide Conflict of interest and Conflict of Commitment policies consistent with the recently approved NIH policy
- Formed the Vice President for research Advisory Board with leading academics at IU's 8 campuses
- Advisory role for the formation of the two Schools of Public Health at IU (one in Bloomington and the other in Indianapolis) as a member of the SPH Executive committee. Accreditations expected this year.
- Member of the IU Research and Technology Commercialization Board of Directors
- Member of the board of trustees and direct supervisor of the IU Kinsey Institute
- Worked closely with the IU Office of Federal Affairs in Washington DC and IU's Counsel.

Accomplishment as VPR of SUNY at Buffalo, 2005-2010

- Administered research funding through the SUNY Research Foundation and the University at Buffalo Foundation (UBF)
- Oversaw and catalyzed growth of UB research expenditures going from 259 million in 2005 to 337 million in 2009, a **30.1% increase**
- Involved in putting together a \$1.35 million/year *Buffalo Protein Therapeutics Consortium* of 7 leading pharmaceutical companies.
- Oversaw the formation of UB's **Stem Cell and Regenerative Medicine** research groups. This was in response to the 600M/ten year New York State Stem Cell Science funding initiative program. The program started in 2008 and by the time I left UB in 2010 we had received over 10M of funding.
- Oversaw compliance with federal, state and university regulations governing research and creative activity
- Managed research misconduct cases collaborating with university and NYS counsel.
- Oversaw the merger of pre- and post-awards units, into the new unit of Sponsored Project Services, with grant life cycle teams that reports to the VPR
- Started UB Book recognition Award ceremony 2007-2010
- Started the VPR Research Advisory Council
- Started the IRB Newsletter
- COEUS implementation to submit grants in the new agency of Grants.gov. I organized a joint effort in collaboration with all 4 SUNY research centers
- Started the formation of the Vascular Bioengineering Research Institute 2009
- Established New Seed Funding opportunities to enhance research and scholarly:

UB2020 Scholars Fund for the Humanities and Social Sciences

UB2020 Interdisciplinary Research Development Fund (IRDF), biomedical and physical sciences and engineering

Multidisciplinary multi million Proposal Support fund (MIPS)

- Initiated a 1M/year return of F&A Principal Investigator Incentives Program
- Chaired the *Empire Initiative* for Hiring Distinguished Professor's Program (EIP)
- Oversaw successful Association for Assessment and Re-Accreditation of Laboratory Animal Care (AAALAC) inspections on 2006 and 2009.
- Started process to obtain accreditation from the Association for the Accreditation of Human Research Protection Programs (AAHRPP), approved on September, 2009.
- Facilitated relations between researchers and affiliated institutions, i.e. Roswell Park Cancer Institute, the Hauptman Woodward Institute and Calspan-University at Buffalo Research Center (CUBRC), UB's Medical School and private industry and government
- Supervised several research centers and core instrumentation facilities
- Center of Excellence in Bioinformatics and the Health Sciences Planning Board Member
- Member of the UB2020 Strategic Strengths Committees

Aging and Chronic Disease
 Artistic Expression and Performing Arts
 Extreme Events: Mitigation and Response
 Integrated Nanostructure Systems
 Molecular Recognition/Bioinformatics
 Cultures and Texts
 Health and Wellness across the Lifespan
 Information and Computing Technology

- Started VPR *Navigator* Quarterly Newsletter (2006-2010)
- Started VPR *IMPACT* Annual Report (2006-2010)
- Oversaw development of Research Policies -
 - a. PI eligibility
 - b. Fiscal Responsibility
 - c. Fiscal Agents
 - d. Proposal Submission Deadlines
 - e. Cost Transfers
 - f. Institutional Conflict of Interest
 - h. Institutional Base Salary

Accomplishment; Chair, Physics Department at Northeastern University

- Physics Department Chair 2004-05
- Interim Physics Department Chair, 2002-04
- As soon as I started as an interim chair we developed a strategic plan. NU's physics department was unusual since it has strong biological physics research (8 faculty members then) as well as high energy and condensed matter physics. The physics department funding among private universities at that time was ranked 11th by the NSF in 2003 since it had a 9 million dollars/year of research expenditures.

- The strategic plan included: 1. Increase undergraduate and graduate enrollments improving student quality. 2. Hire outstanding faculty. 3. Improve department's space and technological resources. 4. Explicitly reward faculty to recognize excellence in research and teaching. 5. Expand degree and educational programs. 6. Improve research climate and increase scholarly productivity. 7. Increase funds for faculty recruitment and development. 8. Improve the image of the department within and outside of the university. 9. Most importantly, provide the department a sense of collegiality within a consensus environment, including the administrative staff. After only 2 ½ years, our progress toward reaching these goals was very good. For example, our freshman enrollment increased by 100% in 2003 and a further 20% in 2004. We simultaneously improved the quality of incoming undergraduate students as measured by a 40-point rise in their average SAT scores. Similarly, we increased the number of applicants to our graduate program by 50% in 2003. This was the beginning of the significant transformation by NU that has jumped from 116 points from *156 to 40* in The World & News Reports rankings within the last 15 years.
- I hired four new Assistant professors 3 of which got the NSF Career development award and the other a K21 NIH training grant.
- We introduced a new way of teaching physics to engineering students at that time. The new approach was based on a program named *Revoir*, developed by E. Mazur at Harvard. We tailored our engineering student's classes following this approach and we had very good results. The NU program won a teaching award from the National Academies.

Service to Northeastern University

- University Senate Member, 1982-1984.
- Organized seminars for Condensed Matter Physics seminars for several years.
- Organized seminars for ten years for the Center for Interdisciplinary Research on Complex Systems (CIRCS)
- *Active role* in the search for a solid-state theory faculty member 1985 and 2003.
- *Member* of several in-house committees:
Journal Club for graduate students
CASGS (Committee on Academic Standing of Graduate Students)
Computer group representative
RAC (Raise and Appeals Committee)