

Luis H. Cisneros

CONTACT INFORMATION

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Beyond Center, ASU Tempe, AZ 85287
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RESEARCH INTERESTS

Complex systems: emergence of collective behavior and cooperation in extended dynamical systems. Adaptation and self organization associated with the emergence of multicellularity, cancer evolution and social dynamics. Pattern formation, bio-fluid-dynamics, cell migration and motility, network theory, systems biology, bioinformatics.

EDUCATION

PhD, Physics. **December, 2008**

University of Arizona. Department of Physics. Tucson, Arizona

Topic: Fluid Dynamics and Collective Phenomena in concentrated suspensions of swimming micro-organisms

Adviser: Raymond E. Goldstein

M.S. Physics **December, 2002**

Universidad Central de Venezuela. Facultad de Ciencias. Caracas, Venezuela

Topic: Measure of Information Transfer and Analysis of Collective Phenomena in Chaotic Coupled Map Networks and other Complex Systems

Adviser: Juan Jiménez

Licenciatura Physics (Undergraduate Degree) **May, 1998**

Universidad Simón Bolívar. Departamento de Física. Sartenejas, Miranda, Venezuela

Topic: Gauge Theory of Affine-Metric Gravity; extended General Relativity

Adviser: Isbelia Martín

PROFESSIONAL EXPERIENCE

Assistant Research Professor **August 2019 -**

BioDesign Institute, Arizona State University Tempe, Arizona

Systems biology. Bioinformatics. Ecology of neoplasms. Mathematical modeling of cancer

Research Scientist **July 2015 - April 2019**

NantOmics, LLC Phoenix, Arizona

Bioinformatics, genomics and proteomics of cancer. Systems biology.

Adjunct Faculty **June 2015 - 2019**

Arizona State University - Beyond Center. Tempe, Arizona

Systems biology, computational biology, cancer and the evolution of multicellularity.

Assistant Research Professor **March 2015 - June 2015**

Arizona State University. School of Life Sciences. Tempe, Arizona

Systems biology, computational biology, evolutionary dynamics of cancer.

Post Doctoral Scholar **November, 2010 - December, 2014**

Arizona State University - Beyond Center. Tempe, Arizona

Member of the ASU Center for the Convergence of Physical Science and Cancer Biology.

Biophysical aspects of cancer evolution, theoretical models of metastatic progression and connections between the evolutionary transition to multicellularity and mechanisms of cancer development.

Post Doctoral Associate **January, 2009 - November, 2010**

University of Arizona - Physics Department. Tucson, Arizona

Goldstein-Kessler Lab: collective behavior, self organization, many body statistics of self propelled microorganisms and associated fluid phenomena, including experimental work, data analysis and theoretical research.

Research Assistant

August, 2005 - December, 2008

University of Arizona - Physics Department. Tucson, Arizona

Goldstein-Kessler Lab: collective behavior and fluid mechanics of swimming bacteria, including experimental work, data analysis and theoretical research.

PUBLICATIONS

Julia Bos, Luis H Cisneros, Mazel D. **Real-time tracking of bacterial membrane vesicles reveals enhanced transport under antibiotic stress.** (2020) *Submitted*

Yulia Newton, Luis Cisneros, Justin Golovato, Mark Johnson, Christopher Szeto, Andrew J. Sedgewick, Shahrooz Rabizadeh, J Zachary Sanborn, Stephen Charles Benz, Charles Vaske **Analysis of whole transcriptome RNA-Seq of large numbers of clinical FFPE samples for expression profiling** (2019) *Under review*

Joseph X. Zhou, Luis Cisneros, Theo Knijnenburg, Kalliopi Trachana, Paul Davies and Sui Huang, **Phylostratigraphic analysis of tumor and developmental transcriptomes reveals relationship between oncogenesis, phylogenesis and ontogenesis.** *Convergent Science Physical Oncology* (2018) **4**, 025002

Luis Cisneros, Kimberly J. Bussey, Adam Orr, Milica Miocevic, Charles H. Lineweaver and Paul Davies, . **Ancient genes establish stress-induced mutation as a hallmark of cancer.** *Plos ONE* (2017) **12**, e0176258

Luis Cisneros and Timothy Newman. **Quantifying metastatic inefficiency: rare genotypes versus rare dynamics.** *Physical Biology* (2014) **11**, 046003

Thomas K. Park, Luis Cisneros, Edward Nell and Mourad Mjehed. **Urban Sociology in Poor Cities of Africa and the Middle East: A New Methodology Inspired by Robert E. Park's Urban Ecological Approach**, in *The Chicago School Diaspora: Epistemology and Substance*, ed. Jacqueline Low and Gary Bowden. McGill-Queen's University Press (2013).

Sara I. Walker, Luis Cisneros and Paul C.W. Davies. **Evolutionary Transitions and Top-Down Causation**, in *Artificial Life 13: Proceedings of the Thirteenth International Conference on the Simulation and Synthesis of Living Systems*. The MIT Press, Cambridge, Massachusetts (2012).

Luis Cisneros, John O. Kessler, Sujoy Ganguly and Raymond E. Goldstein. **Individual to Collective Dynamics of Swimming Bacteria**, in *Natural locomotion in fluids and on surfaces: Swimming, flying, and sliding*. IMA Volume. Springer. New York (2012),

Knut Drescher, Jörn Dunkel, Luis Cisneros, Sujoy Ganguly and Raymond E. Goldstein. **Fluid dynamics and noise in bacterial cell-cell and cell-surface scattering.** *Proceedings of the National Academy of Sciences (USA)*. (2011) **108**, 10940

Luis Cisneros, John O. Kessler, Sujoy Ganguly and Raymond E. Goldstein. **Dynamics of swimming bacteria: Transition to directional order at high concentration.** *Physical Review E* (2011) **83**, 061907

Luis Cisneros, John O. Kessler, Ricardo Ortiz, Ricardo Cortez and Martin A. Bees. **Unexpected Bipolar Flagellar Arrangements and Long-Range Flows Driven by Bacteria near Solid Boundaries** *Physical Review Letters* (2008) **101**, 168102

Luis Cisneros, Ricardo Cortez, Christopher Dombrowski, Raymond E. Goldstein and John O. Kessler. **Fluid dynamics of self-propelled micro-organisms, from individuals to concentrated populations.** *Experiments in Fluids* (2007) **43**, 737-753

Luis Cisneros, Christopher Dombrowski, Raymond E. Goldstein and John O. Kessler. **Reversal of Bacterial Locomotion at an Obstacle**, *Physical Review E: Rapid Communications* (2006) **73**, 030901(R)

Idan Tuval, Luis Cisneros, Christopher Dombrowski, Charles W. Wolgemuth, John O. Kessler, and

Raymond E. Goldstein. **Bacterial Swimming and Oxygen Transport Near Contact Lines**, *Proceedings of the National Academy of Sciences (USA)* (2005), **102**, 2277-2282

Christopher Dombrowski, Luis Cisneros, Sunita Chatkaew, John O. Kessler, and Raymond E. Goldstein. **Self-Concentration and Large-Scale Coherence in Bacterial Dynamics**, *Physical Review Letters* (2004), **93**, 098103

Thomas K Park, Mourad Mjahed and Luis Cisneros. **Modeling household dynamics in Marrakech, Bamako and Niamey: Perspectives on robustness in urban environments**, in *Case Studies in the Robustness of Coupled Natural and Human Systems*, ed. E. Jen, J. Lansing, T. Park and M.C. Stiner. Forthcoming from Oxford University Press for the Santa Fe Institute.

Luis Cisneros and Juan Jiménez. **Medidas del flujo de información e interdependencia no lineal** (Measure of the information flux and nonlinear interdependency), *Revista Mexicana de Física* (2003), **49**, 17-20 [Article in Spanish]

Luis Cisneros, Juan Jiménez, Mario Cosenza and Antonio Parravano. **Information transfer and nontrivial collective behavior in chaotic coupled map networks**, *Physical Review E: Rapid Communications* (2002) **65**, 045204(R)