Luís M. A. Bettencourt

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Current Positions

Professor
Ecology and Evolution and the College, University of Chicago, Chicago, IL, USA.

Associate Faculty (and Special Friend)
Sociology, University of Chicago, Chicago, IL, USA.

Membership Engagement Chair
AAAS Section Social, Economic and Political Sciences

External Professor of Complex Systems
Santa Fe Institute, Santa Fe, NM, USA.

Program Chair, Professor
Master's Program on Sustainable Cities, Norman Foster Institute
Madrid, Spain

Member
Committee on Data Sciences, University of Chicago

Member
Committee Environment, Geography and Urbanization, University of Chicago

Core Faculty
Computational Social Science, University of Chicago

Brief Biography

Luís M. A. Bettencourt is a Professor of Ecology and Evolution and the College at the University of Chicago. He is also Associate Faculty of the Department of Sociology and External Professor at the Santa Fe Institute. He grew up in Lisbon (Portugal) and obtained his undergraduate degree in Engineering Physics from IST Lisbon. He obtained his PhD from Imperial College

London in Theoretical Physics and held postdocs and research positions at the University of Heidelberg (Germany), Los Alamos National Laboratory, MIT, and the Santa Fe Institute.

His research focuses on the theory and modeling of complex systems and the processes that underlie the structure and growth of cities, in particular. He connects interdisciplinary concepts and advanced mathematics with new technologies and data to create new systems' theory and methods. This work also involves collaborations with governments, NGOs, and interdisciplinary researchers worldwide to co-produce new insights and transformative practices for sustainable development. His work is well-known academically and widely covered in the media. It has helped shape our fundamental understanding of complex systems and human societies and create novel approaches to challenges of urbanization and sustainability.

Work Experience

2017 – present	Professor UNIVERSITY OF CHICAGO (Chicago, IL) Department of Ecology and Evolution and the College
2017 – present	Associate Faculty (and Special Friend) UNIVERSITY OF CHICAGO (Chicago, IL) Department of Sociology
2017 – present	External Professor of Complex Systems SANTA FE INSTITUTE (Santa Fe, NM)
2017 – 2023	Inaugural Faculty Director Mansueto Institute for Urban Innovation UNIVERSITY OF CHICAGO (Chicago, IL)
2011 – 2017	Professor SANTA FE INSTITUTE (Santa Fe, NM)
2005 – 2011	Scientist 4 LOS ALAMOS NATIONAL LABORATORY (Los Alamos, NM) Theoretical Division – T-5 (Applied Mathematics)
2003 – 2005	Technical Staff Member [Research Scientist] LOS ALAMOS NATIONAL LABORATORY (Los Alamos, NM) Computer and Computational Division
2000 – 2003	Senior Postdoctoral Fellow MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, MA) Center for Theoretical Physics
1997 – 2001	Slansky Distinguished Postdoctoral Fellow and Director's Postdoctoral Fellow LOS ALAMOS NATIONAL LABORATORY (Los Alamos, NM) Theoretical Division
1996 – 1997	Postdoctoral Fellow HEIDELBERG UNIVERSITY (Heidelberg, Germany) Institute for Theoretical Physics

EDUCATION

| 1992 – 1996 | Doctor of Philosophy (Ph.D.) Department of Theoretical Physics Imperial College, University of London, London, UK |
| 1987 – 1992 | Licenciatura (5 years) Department of Engineering Physics, First Class Honors, Instituto Superior Técnico, Lisbon, Portugal |

Selected Research News Coverage

| 2023 | African slum map paints the real picture of urban poverty, CGTN Africa |
| | The science behind city layouts and racial biases Science Tech Daily |

| 2022 | Argonne National Laboratory to establish center on climate change impact in Chicago UChicago News |
| | Rethinking cities: What leaders have been getting right or wrong GovInsider |

2021	How the UN aims to save humanity, with Chris Williams and Luis Bettencourt (Ep. 79) UChicago Big Brains Podcast
	UChicago Focuses on the Future of Cities in a Post-COVID-19 World WTTW News
	Study Finds Large Cities Promote Lower Rates of Depression WTTW News
	How do cities impact mental health? A new study finds lower rates of depression UChicago News
	Living in the big city may help fight depression The Times London
	How the Pandemic Is Still Ruining Our Plans Axios
	The Bigger the City, the Lower the Depression Rates? US News
	"On Cities" Masterclass Series e-Flux Architecture

2020	The city will survive covid19 Newsday
	COVID 2025: How COVID-19 will challenge and change cities, with Luis Bettencourt UChicago News
	This is one key metric Utah should track as the state considers easing coronavirus restrictions The Salt Lake Tribune
	Coronavirus Attack Rate Increases With City Size. How Should Large Cities Respond? SciTech Daily

Why isn't California's coronavirus crisis as bad as New York's? Size doesn't tell the whole story [The Globe and Mail](#)

Map Reveals Hidden U.S. Hotspots of Coronavirus Infection [Scientific American](#)

Covid-19 spreads much faster in big cities [Futurity: Research News](#)

Coronavirus is hitting larger cities harder. How should they respond? [UChicago News](#)

State-level data misses growing coronavirus hot spots in U.S., including in the South [UChicago News](#)

Mapping Tech Could Formalize Settlements for One Billion People [Next City](#)

The Metric We Need to Manage COVID-19 [Systrom](#)

The physics that set out to study a million neighborhoods to improve cities [El País](#)

Uber and Lyft Are Convenient, Competitive and Highly Carbon Intensive [Inside Climate News](#)

Act Locally, Learn Globally: Luis Bettencourt on Building from the Community Up [TheCityFix](#)

Concern mounts over new Lagos physical planning, building control regulations [The Guardian Nigeria](#)

2019   Mapping Fast-growing Informal Settlements in Africa [GIM International](#)

African slum map exposes true scale of urban poverty [Reuters](#)

Big Brains Podcast Saving Our Cities By Studying A Million Neighborhoods With Luis Bettencourt (Ep. 34) [UChicago News](#)

In fight against global poverty, researchers map fast-growing informal settlements in Africa [UChicago News](#)

UChicago and UN to host global symposium on sustainable cities and neighborhoods [UChicago News](#)

Urban October at University of Chicago to Focus on Urgent Challenges Facing Global Cities [PR Newswire](#)

The Evolution of the Galápagos [The College News](#)

On Cities Workshop 2019 – Public Debates [Norman Foster Foundation](#)

The Fabric of Our Lives [Siam News](#)

Science and Culture: Can the principles of topology help improve the world's slums? [PNAS](#)

Why a 1925 book is still relevant to urban sociology [UChicago News](#)

Bettencourt to Deliver Buthman Lecture March 28 [Hendrix College News](#)

The Excruciating, Impossible Science of Airport Delays [Wired](#)

From the Technician to the world. It is in physics that a new generation of Portuguese geniuses is born [dn_insider](#)

2018   How mapping the Galápagos could create more sustainable cities [UChicago News](#)

Math Helps Sprawling Cities Grow Sustainably And Reduce Slum Conditions [Forbes](#)

Scientists develop tools to bring infrastructure to slums [UChicago News](#)

Mansueto Institute Seminar: Juval Potugali [Dialogo](#)

Here Are 5 Predictions for the Future of Our Cities [Brink News](#)

The Future of Urban Innovation [Apple Podcasts](#)

Podcast: Science combines with data to reveal complexity of cities [UChicago News](#)

The circular economy could save life on Earth – starting with our cities [World Economic Forum](#)

The Math Behind a Localized Approach to the UN's Sustainable Development Goals [Next City](#)

2017   The city is not a massive machine, says Luis Bettencourt [LiveMint](#)

Why Even the Hyperloop Probably Wouldn't Change Your Commute Time [NY Times](#)

Luis Bettencourt named inaugural director of Mansueto Institute for Urban Innovation [UChicago News](#)

The New Urban Science T[he Chronical of Higher Education](#)

Understanding Our Cities, Thanks To Beautiful Maps [Forbes](#)

Canada needs a fuller house to thrive – but population growth isn't enough [The Globe and Mail](#)

2016   Y Combinator's Plan to Build a New City? Not Actually Crazy [Wired](#)

The Relationships Between Skyscrapers and Great Cities [City Lab](#)

Urban Transit's Uncertain Future [Nova](#)

These Cities Could Lead the Driverless Car Revolution [Fortune](#)

Policy: Urban physics [Nature](#)

Medieval cities not so different from modern European cities, according to study [Phys Org](#)

What might Jane Jacobs say about smart cities? [The Conversation](#)

Applied Mathematics To Design The Perfect Future City [WorldCrunch](#)

What a 1967 Government Pamphlet Predicted About the Future of U.S. Cities [Next City](#)

2013	Scientific Proof that Cities are like Nothing Else in Nature [City Lab](#)

Life in the City is Essentially one Giant Math Problem [Smithsonian](#)

Solar and wind innovation reflected in booming patents [USA Today](#)

Scientists Looking to Solve the Problem of Slums Devise a New Way to Look at Big Data [TXchnologist](#)

Cities are a new kind of complex system: Part social reactor, part network [Science Daily](#)

The city triumphs, again [The Economist](#)

A Mathematical Guide to the World's Most Livable Cities [Scientific American](#)

Cities Grow And Behave As Coherent Entities [Inside Science](#)

All That 'Anonymous' Cell Phone Data Tracking Can Actually Identify You [Business Insider](#)

Innovative Cities Superlinear and Progressive [Net News Ledger](#)

2012	The laws of the city [The Economist](#)

Sustainability in the new urban age [BBC](#)

Gigalopolises: Urban Land Area May Triple by 2030 [Scientific American](#)

2011	Too Hard for Science? Simulating the human brain [Scientific American](#)

Collaboration: the mother of invention [Boston Globe](#)

It's biology: all cities are alike [Sydney Morning Herald](#)

2010	A Physicist Solves The City [NY TImes](#)

A unified theory of urban living [Nature](#)

2009	Math and the City The New York Times Map of Knowledge [The New York Times](#)

Knowledge, in Real Time [SEED Magazine](#)

Web usage data outline map of knowledge [Nature News](#)

A New Picture of the Two Cultures [SEED Magazine](#)

Map of Science Looks Like Milky Way [Wired Science](#)

Why the future of humanity and the long-term sustainability of the planet are inextricably linked to the fate of our cities. SEED Magazine

How the Crash Will Reshape America The Atlantic

User Clickstreams Lead To A 'Map Of Science' Science 2.0

2008   Computer just might reveal the secrets of the brain Santa Fe New Mexican

Scientists examine new way to track outbreaks Santa Fe New Mexican

Modeling the Emergence and Development of Scientific Fields U.S. Department of Energy: Office of Scientific and Technical Information

2007   To escape flu - move to the country Telegraph.co.uk

The urban organism Nature News and Views

If You Can Make it There: Cities Are the Greatest Generators of Innovation and Wealth Scientific American

Big cities need a fast-paced life to grow Nature News

Innovation and Growth: Size Matters Breakthrough Ideas for 2007: Harvard Business Review

Ideas: the lifeblood of cities New Scientist

The Living City: A new science applies metabolism to the metropolis SEED Magazine

Projects and Grants

2023 – present	CROCUS: Community Research on Climate and Urban Science (Co-investigator, Principal Investigator: Cristina Negri) US Department of Energy. Project based at Argonne National Laboratory.
2021 – present	"PRESUR: Planning a Resilient and Equitable State Using Real-time data" (Co-Investigator, Principal Investigator Isabel Cruz) Discovery Partners Institute, $125,000, University of Illinois at Chicago/University of Chicago/University of Illinois at Urbana-Champaign.
2016-2021	"Information Networks and the Evolution of Social Organizations" (Co-Investigator, Principal Investigator D. Wolpert) National Science Foundation, $770,000, Santa Fe Institute.

2014 - 2016	"Human Development and Community Dynamics in Cities Around the World," (Principal Investigator, Luís Bettencourt), The John D. and Catherine T. MacArthur Foundation, $182,381, 1/1/2014 – 1/1/2016, Santa Fe Institute.
2012 - 2014	"Collection, Organization and Analyses of Community Based Survey Data from informal Settlements," (Principal Investigator, Luís Bettencourt), Bill and Melinda Gates Foundation, $1,025,572, 11/1/2012 – 12/31/2014, Santa Fe Institute.
2010 – 2012	"Energy and Environmental Drivers of Stress and Conflict in Multi-scale Models of Human Social Behavior," (Principal Investigator, Luís Bettencourt), Army Research Office, $400,000, 3/15/2010 – 3/15/2012, Santa Fe Institute.
2010	"Comprehensive Program to Develop Theory and Applications of Urban Organization and Dynamics," (Co-Principal Investigator, Luís Bettencourt), Rockefeller Foundation, $203,043, 4/1/2010 – 9/30/2010, Santa Fe Institute.
2010 – 2015	"Predictive Modeling of the Emergence Development of Scientific Fields," (Co-Principal Investigator, Luís Bettencourt), MIT / NSF, $92,664, 7/1/2010 – 6/30/2012, Santa Fe Institute, Investigator: REU Site SFI's Transdisciplinary Research through Computational Modeling in the Social, Biological, and Physical Sciences Program NSF, $623,856, 06/01/10 – 05/31/2015, Santa Fe Institute.
2010 – 2011	"Innovation and Growth of Human Social Organizations from Cities to Corporations," (Co-Principal Investigator, Luís Bettencourt), NSF, $106,425, 04/01/10 – 3/31/2011, Santa Fe Institute.
2009 – 2012	"Towards a Predictive Theory of Social Organization and Dynamics in Cities," (Principal Investigator, Luís Bettencourt), James S. McDonnell Foundation, $437,131, 9/1/2009 – 8/31/2012, Santa Fe Institute.
2008 – 2011	"Mapping the Structure and Evolution of Sustainability Science," (Principal Investigator, Luís Bettencourt), NSF, $82,802, 8/1/2008 – 1/31/2011, Santa Fe Institute.
2008 – 2011	"Synthetic Cognition through Petascale Models of the Primate Visual Cortex," (Principal Investigator, Luís Bettencourt), Department of Energy, $4,700.000, October 2008 – October 2011, Los Alamos National Laboratory
2009 – 2012	"Robust unsupervised operation under uncertainty through information theoretic optimization," (Co-Principal Investigator, Luís Bettencourt), Los Alamos National Laboratory LDRD, $1,110,900, 10/01/2009 – 10/01/2012, Los Alamos National Laboratory

| 2004 – 2007 | "Modeling the structure and dynamics of neural networks grown in vitro," (Principal Investigator, Luís Bettencourt), Los Alamos National Laboratory LDRD, $900,000, 10/01/2004 – 10/01/2007, Los Alamos National Laboratory |

Honors and Awards

2019	Elected "Member-at-Large" American Association for the Advancement of Science, Section K: Social, Economic and Political Sciences
2016	Invited to White House Frontiers Conference.
2015	Member of PCAST's (President's Council of Advisors on Science and Technology) Working Group on "Technology and the Future of Cities."
2015	Member of the World Cities Summit Young Leaders (WCSYL) network.
2014	Kavli Fellow of the US National Academies of Science Presentation at Frontiers in Science Japan-USA, Tokyo.
2017	Best Paper European Complex Systems Society annual meeting.
2003	Computer Research Association International Conference award "Grand Research Challenges in Information Security and Assurance", Airlie House, Warrenton, Virginia.
2000	Slansky Distinguished Postdoctoral Fellowship, Theoretical Division. Los Alamos National Laboratory, for interdisciplinary research.
1998 – 2000	Director's Postdoctoral Fellowship. Los Alamos National Laboratory. Portuguese National Science Foundation (JNICT)
1992 – 1996	Post-graduate Award, to conduct postgraduate studies leading a PhD degree.
1990 – 1992	Fellowship for Young Researchers, by INIC, Portuguese National Institute for Scientific Research, while an undergraduate.

Graduate Supervision and Teaching Experience

Classes currently taught:

Introduction to Urban Science (ENST 24600)
An integrated overview of cities and urbanization based on interdisciplinary concepts,

data, scientific theory, and mathematical and computational methods. Based on the [textbook](#). 18 lectures, weekly quantitative/qualitative assignments

The Mathematics of Evolution (ENST 24600)

A course on mathematical ecology, population genetics, and learning theory casting evolution in light of modern statistical mechanics, probability theory, and statistics, with connections to methods of inference, information theory and artificial intelligence.

18 lectures, weekly quantitative/computational assignments

Urban Sustainable Development (SOCI 40253)
A graduate course on climate change, sustainability, and the role of cities in these processes in terms of risk, impacts, new data, and solutions.
18 lectures, class participation, final 1,500-word paper, and presentation.

Select Graduate Supervision:

2019 – current	Brandon Grandison, Ecology and Evolution Doctoral student research supervision, University of Chicago, Chicago, U.S.A.
2019 – current	Jordan Kemp, Physics Doctoral student research supervision and degree sponsorship, University of Chicago, Chicago, U.S.A.
2019 – 2023	Suraj Sheth, MD/PhD Ecology and Evolution Doctoral student research mentorship and degree sponsorship, University of Chicago, Chicago, U.S.A.
2019 – 2020	Cooper Nederhood, Graduate Thesis and Institute Research Supervision Masters Computational Social Science, Mansueto Institute for Urban Innovation, University of Chicago, Chicago, U.S.A.
2019 – 2020	Satej Soman, Graduate Thesis and Institute Research Supervision Masters in Computational Analysis and Public Policy, Mansueto Institute for Urban Innovation, University of Chicago, Chicago, U.S.A.
2018 – 2020	Daniel Zuend, Postdoctoral Fellow Supervision and Mentorship, Mansueto Institute for Urban Innovation, University of Chicago, Chicago, U.S.A.
2019	External Mentor: Santa Fe Institute Omidyar Fellow Vicky Chuqiao Yang, Santa Fe Institute, Santa Fe, U.S.A.
2019	Workshop Mentor: Norman Foster Foundation On Cities Workshop, Norman Foster Foundation, Madrid, Spain.
2018 – current	Professor: Theoretical Ecology Graduate Student Courses, Department of Ecology and Evolution, University of Chicago, Chicago, U.S.A.

2018, 2019	Guest Professor: The School of Architecture and Interior Design of the University of San Francisco de Quito, International Architecture Studio in The Galapagos Islands, "Cities in Natural Protected Areas."
2016	Curriculum Committee: ASU / SFI Masters in Complex Systems
2016	Faculty Director Global Sustainability Summer School: Urban Sustainability (2016).
2011, 2014	Lecturer Santa Fe Institute Complex Systems Summer School.
2014	Lecturer Lipari Summer School "Smart Cities."
1999-2003,	Supervisor and mentor for summer students at SFI and LANL.
2007-2011	These are Summer graduate programs for undergraduates and graduate students to experience research at LANL and SFI
1997	Tutor at BUSSTEP., British Universities Summer School in Theoretical High Energy Physics, University of Sussex, Falmer, U.K. September 9-24, 1997. Tutors are selected among promising senior postdocs to cover the materials in the school's syllabus. These reflect the perceived basic and new exciting fields of high energy Physics and Cosmology. My field of expertise was non-equilibrium quantum fields.
1994 – 1995	Teaching Assistant in Dynamical Systems and Chaos, Imperial College, London, England. October 1994-January 1995.
1993 – 1994	Teaching Assistant in Quantum Mechanics, Imperial College, London, England. October 1993-January 1994.
1992	Teaching Assistant in Thermodynamics, Instituto Superior Tecnico, Lisbon, Portugal. February 1992-July 1992.
1991 – 1992	Assistant in Classical Electrodynamics Instituto Superior Técnico, Lisbon, Portugal. October 1991-January 1992.
1996 – 1997	Assisted with final examinations for Physics undergraduates at the University of Heidelberg, between October 1996 and November 1997.

Service and Professional Memberships

Member of the College Council at the University of Chicago.

Member Sonnenschein Medal of Excellence Selection Committee, University of Chicago

Member of the US State Department Delegation, UN Habitat Assembly (Nairobi, Kenya, June 2023)

Advisory Committee Environmental Community (Eco) Network at the University of Chicago.

Member of Committee on the Environment, Geography and Urbanization (CEGU) at the University of Chicago.

Member of Center for Data and Computing (CDAC) Steering Committee at the University of Chicago.

Member of Urban Architecture and Design (UAD) Committee at the University of Chicago.

American Association for the Advancement of Science (AAAS). Member American Association Geographers Member of Executive Committee of the Center for Non-linear Studies (Los Alamos National Laboratory). Member-at-Large for Section K (Social, Economic &Political Sciences).

Advisory Council member of Foundation for Food and Agriculture Research (FFAR).

Member of Committee on Geographical Sciences, University of Chicago.

Member of Social Reactors Working Group CU Boulder Department of Anthropology and ASU/SFI Center for Biosocial Complex Systems.

Member of Search Committee Deputy Division Leader, Theoretical Division. Los Alamos National Laboratory.

Select Invited Talks and other Scientific Activities

Invited talk at Physics of Social Systems, American Physical Society Annual March Meeting, Minneapolis MN, March 2024.

Invited keynote panel presentation: Climate Security Roundtable: Urban Systems. National Academies of Science, Engineering and Medicine, Washington DC, February 2024.

Keynote Presentation at IFO Institute conferences: Understanding Socio-Economic Inequalities with Novel Data and Methods, Leibniz Institute for Economic Research at the University of Munich, February 2024.

Invited colloquium, German Aerospace Center (DRL), Munich, Germany, February 2024.

Invited Talk in "The Time-Space Evolution of Economic Activities: Mathematical Models and Empirical Applications", Economics and Finance Department, LUISS (Luiss–Libera Università Internazionale degli Studi Sociali), Rome, Italy, December 2023.

Keynote presentation at International Conference on Urban Science and Sustainability,

Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China, December 2023.

Keynote Presentation at First Research Summit of Urban Science, Tsinghua University, Beijing, China, August 2023.

Speaker, Annual Applied Complexity Network and Board of Trustees Symposium "The 21st Century Question: Emergently Engineering the Future," Santa Fe Institute, Santa Fe U.S.A., November 2022.

Moderator and Organizer, Impact on Human Health panel | A Joint Forum on Addressing the Climate & Energy Challenge, UChicago Global, Chicago, U.S.A., October 2022.

Speaker, SatSummit 2022, Washington DC, U.S.A., September 2022.

Speaker, Cornell Mui Ho Center for Cities Launch Symposium, Cornell University, Ithaca, U.S.A., September 2022.

Participant, Strengthening the role of Cities in the Global Sustainable Development Agenda, Indian Intitute for Human Settlements, New York City, September 2022.

Science of Cities Knowledge Council Member and Speaker, World Cities Summit, Centre for Liveable Cities, Singapore, August 2022

Speaker, Workshop on Quantitative Human Ecology, International Centre for Theoretical Physics, Trieste, Italy, July 2022.

Organizer, The 8th International Conference on Computational Social Science, University of Chicago, Chicago, U.S.A., July 2022.

Organizer, Kreisman for Housing Law and Policy Symposium – "Beyond the Single-Family Home: Zoning, Equity, and Access," University of Chicago, Chicago, U.S.A., May 2022.

Organizer, Metrolab, University of Chicago, Chicago, U.S.A., April 2022.

Speaker, Distinguished Webinar Series—Urban Systems Forum, The University of Hong Kong, Hong Kong, Virtual, April 2022.

Speaker, Lecture in Planning Series (LiPS), Columbia University Graduate School of Architecture, Planning and Preservation, New York City. U.S.A., Virtual, March 2022.

Speaker, New York University Center for Urban Science and Progress Seminar Series, New York City. U.S.A., Virtual, March 2022.

Speaker, Futuro Remoto 2021, Napoli, Italy, Virtual, November 2021.

Keynote, The Geography of Neighborhoods: Understanding the Human Geography Fabric of Neighborhoods, World-Wide Human Geography Data Working Group (WWHGD), Virtual, November 2021.

Keynote Lecture, The European Colloquium on Theoretical and Quantitative Geography, The University of Manchester, November 2021.

Speaker, Geopalooza 2.0, Bill & Melinda Gates Foundation, Virtual, October 2021.

Speaker, USS Lecture Series, Institute of Urban Environment, China Academy of Science, Virtual, Oct 2021.

Speaker, "Thought Leadership Dialogue" with Singapore's Minister for National Development, Mr. Desmond Lee, Centre for Liveable Cities, Singapore, Virtual, October 2021.

Speaker, Complexity Science Research Community Workshop, Centre for Liveable Cities, Singapore, Virtual, October 2021.

Organizing Committee, Data-Informed Societies Achieving Sustainability Workshop, National Academies of Science, Engineering and Medicine, WSHING TON DC, U.S.A., Virtual, September 2021.

Speaker, Multi-Sector Dynamics Community of Practice Workshop, Oak Ridge National Laboratory, Virtual, July 2021.

Visiting Virtual Fellow, Centre for Liveable Cities, Singapore, Virtual, July 2021.

Speaker, 4th Tripartite ACP/EC/UN-Habitat Conference, Land, Housing and Shelter Section, Urban Practices Branch | UN-HABITAT, Virtual, July 2021.

Keynote Speaker, Sustainability Science Days 2021, University of Helsinki, Virtual, May 2021.

Speaker, America Resilient Climate Conference, Argonne National Laboratory, Virtual, April 2021.

Participant and Speaker, Lausanne Workshop - Healthy Urban Systems Workshop and MOOC, University of Lausanne, Virtual, September 2020.

Speaker, Microsoft Urban Futures Summer Workshop, Microsoft Corporation, Virtual, July 2020.

Organizer, Speaker, and Exhibitor at WUF 10, Mansueto Institute for Urban Innovation, University of Chicago, UN Habitat, Abu Dhabi, UAE, February 2020.

Invited Lecturing Guest Urban Thought Leader Symposium, Cornell University, Ithaca, U.S.A., February 2020.

Member of Institute of Design External Review Committee, Illinois Institute of Technology, Chicago, U.S.A. January 2020

Invited Member of External Review Team, Urban Resources Initiative and the Hixon Center Yale University, New Haven, U.S.A., Jan 2020.

Presenter, Conference on "Improving Lives of the Urban Poor" at the University of Chicago Center in Delhi, Delhi, India, December 2019.

Speaker, Advancing Urban Sustainability in China and the United States
A National Academies Workshop in Collaboration with the Chinese Academy of
Sciences, Washington, DC, U.S.A., December 2019.

Speaker and Participant, City Managers Days 2019: Digitalization of Metropolitan
Spaces, Barcelona, Spain, November 2019.

Participant, 'The City 2.0: smart People, Places, Planning' held at
the Kennedy School of Harvard University in Cambridge, Boston, U.S.A., November
2019.

Organizer, Speaker, Moderator, Global Symposium on Sustainable Cities and
Neighborhoods, Mansueto Institute for Urban Innovation, University of Chicago,
Chicago, U.S.A., October 2019.

Participant, Global Urban Network Workshop, University of Toronto, Toronto, Canada,
October 2019.

Participant, Graduate Education for a New Sustainable Urban Systems Science:
Designing a New PhD Curriculum Integrating Sustainability Science and Urban
Science, Arizona State University, Tempe, U.S.A., September 2019.

Speaker and Participant, CURES Connections Workshop: New Voices and Paths to
Urban Sustainability, Discovery Partners Institute, Chicago, U.S.A., August 2019.

Organizer, Moderator, Speaker, Lecturer, Global Sustainability Summer School, Santa
Fe Institute, Santa Fe, U.S.A., July 2019.

Speaker, 2019 Pritzker Forum on Global Cities, Chicago Council on Global Affairs,
Chicago, U.S.A., June 2019.

Participant, Workshop on Urban Scale Processes and their Representation in High
Spatial Resolution Earth System Models, Argonne National Laboratory, Lemont, U.S.A.,
May 2019.

Speaker, University of Toronto Department of Civil+Mineral Engineering 2018/2019
Distinguished Lecture series, University of Toronto, Toronto, Canada, April 2019.

Speaker, Participant, University of Chicago—Tel Aviv University Workshop on Cities
and Urbanism, City Center—Research Center for Cities and Urbanism, Tel Aviv
University, April 2019.

Organizer, Speaker, Cities and Urbanization in China Workshop, Mansueto Institute for
Urban Innovation, University of Chicago, March 2019.

Speaker and Visiting Lecturer at Lee Kuan Yew Centre for Innovative Cities, Singapore,
Republic of Singapore, January 2019.

Member and Guest Expert, Urban Solutions and Sustainability International Advisory
Panel (USS IAP) Singapore, Republic of Singapore, January 2019.

Speaker, Participant for the NASEM Data, Modeling, Simulation for Urban Sustainability
Workshop, Washington, DC, January 2019.

Moderator by Invitation, Conference on "Life in India's Slums" at the University of Chicago Center in Delhi, Delhi, India, December 2018.

Keynote, Urban Transitions 2017, Scientific Committee, Elsevier, Sitges, Barcelona, Spain, November 2018.

Speaker, Association of Collegiate Schools of Planning (ACSP) Annual Conference, Buffalo Niagara Convention Center, Buffalo, U.S.A., October 2018.

Invited Participant, Project discussion group with Nicholas Negroponte and the Norman Foster Foundation, On the Future of Cities, MIT, Boston, MA, October 2018.

Speaker, Life in India's Slums Conference, Delhi, India, September 2018.

Opening Keynote, Energy Innovation Trends, NREL Partner Forum, Golden, U.S.A., August 2018.

Invited to participate in an Analytic Exchange titled "Trends in Urbanization in Sub-Saharan Africa" on the "Building Sustainable Cities" Panel co-sponsored by the Bureau of Intelligence and Research of the U.S. Department of State and the National Intelligence Council, July 2018.

Guest, 2018 HLPF Local and Regional Governments' Forum, New York City, U.S.A., July 2018.

Speaker, Civitas at Large: A Public Conversation, Dimensions of Citizenship, University of Chicago and the School of the Art Institute of Chicago, U.S. Pavilion, Venice Biennale, Venice, Italy, May 2018.

Panel Member, Today's "Smart" City, Rockefeller CityXChange, Bellagio Center, Italy, May 2018.

Speaker, Participant, Smart Cities Week Silicon Valley, Santa Clara, CA, May 2018.

Speaker, WRI Ross Center for Sustainable Cities, Washington, DC, February 2018.

Organizer and Speaker, US-China Forum, Mansueto Institute for Urban Innovation, University of Chicago, Chicago, U.S.A., October 2017.

Consultant for Department of Energy, Office of Science and Technology Information (OSTI).

Reviewer for Department of Energy, National Science Foundation, National Institutes of Health, UK's EPSERC, Netherlands Organization for Scientific Research and Swiss National Science foundation.

Member of the American Physical Society (APS), Society for Pure and Applied Mathematics (SIAM), Society for Neuroscience (SfN), and Society for American Archeology (SAA).

Scientific Committee of "International Conference on mathematical aspects of Computer and information Sciences" (MACIS 2006), Beijing, China, July 2006 and of several other International conferences in Information Sciences, Computer Science and complex Systems.

Organizing Committee of "Opportunities and Challenges in Distributed Sensor Networks", LANL/CNLS March 2006.

Organizer of "Information Processing in Complex Systems" Seminar series, held at the Center for Non-Linear Science, LANL.

Referee for Science, Nature, Proceedings of the National Academy of Sciences (USA), Nature Physics, Nature Cities, Nature Communications, Nature Sustainability, Science Advances, Complexity, Chaos, Physical Review Letters, Physical Review A, Physical Review D, Physical Review E, Physics Letters A, Annals of Physics, Physics of Plasmas, Journal of Statistical Physics, Physica A, Quantum and Classical Gravity, Journal of Artificial Societies and Social Simulation, Urban studies and several others.

Scientific Secretary of School and A.S.I. in Current Topics in Astro-fundamental Physics, Erice, September 1994.

Assistant Coordinator of A.S.I. in Electroweak Physics and The Early Universe, Sintra, Portugal, March 1994.

Algorithmic and Computational Experience

Expertise in deep learning networks, Bayesian inferenc, information theoretic optimization, numerical methods for ordinary and partial differential equations, stochastic systems, nonlinear dynamics, time series analyses, econometrics, scaling analyses, and graph theory.

I know Unix/Linux, OS X operating systems and Python, R, PERL, HTML, and several other data analysis, plotting and symbolic manipulation platforms.

Language Proficiency

I have native proficiency in Portuguese and English. I have fluent communication skills in Spanish, French and German and some oral proficiency in Italian.

Patents

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