

FisMatEcol Boletín

Junio 2023

Dr. Oliver López Corona
Dra. Elvia Ramírez Carrillo



Eventos



Nassim Nicholas Taleb ✓

@nntaleb · 14 jun. · 📎



Friends, our Real World Risk Workshop (now transformed into summer school) [#RWRI](#) (18th ed.) takes place July 10-21 (remote). We have a few scholarships left but more importantly we are looking for a guest speaker on AI-LLM-Robotics for a 45 Q&A with us.

realworldrisk.com

16 - 20 OF OCTOBER

Salvador, Bahia, Brazil



Oportunidades



Early Career Funding Opportunities

Download the most recent file here:

[Early Career Funding Opportunities](#)

(xlsx file; updated June 7, 2023)

In addition to the full list above, which contains all postdoctoral funding opportunities, below are files containing only specific areas of research. Please note that these do not include funding opportunities that are open to any field of research.

[Early Career Funding Opportunities \(Cancer/Oncology\)](#)

[Early Career Funding Opportunities \(Neuroscience/Neurology\)](#)



Pontus Skoglund

@pontus_skoglund

Postdoc position in ancient population genomics of dogs and wolves in our lab. crick.wd3.myworkdayjobs.com/External/job/L...

See our previous @andersbrgstrm et al. papers



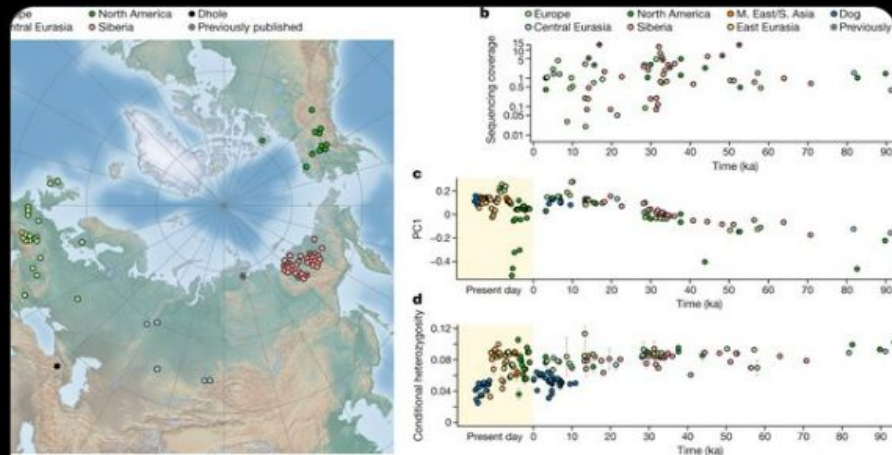
science.sciencemag.org/content/370/65...



nature.com/articles/s4158...

If you are interested, send in your CV with the link above.

[Traducir Tweet](#)



Conceptos





The most significant genius: Emmy Noether



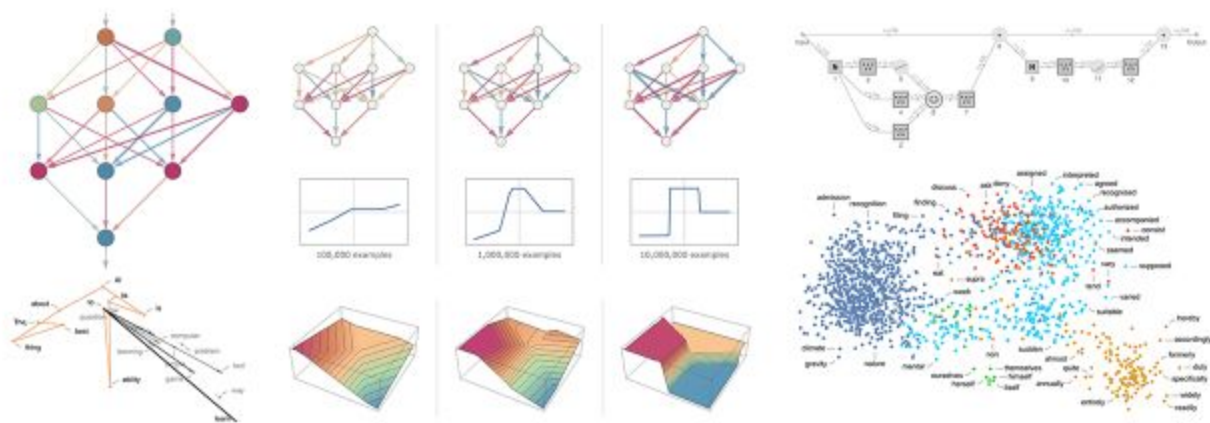
WITH DR. DON LINCOLN

EMM
NOETHER



What Is ChatGPT Doing ... and Why Does It Work?

February 14, 2023



Cursos

MEMORIA DE LA ESCUELA

Escuela de primavera
en física y matemáticas
aplicadas a la ecología

VIRTUAL

Require pre-registro: <https://forms.gle/hBokNotfzKpSmPAYA>

Organiza: IIMAS, Fac de Psicología, IxM-CONACyT

Comité: Dr. Oliver López-Corona, Dra. Elvia Ramírez-Carrillo, Dr. Pablo Padilla

Sitio web: <https://www.lopezoliver.otrasenda.org/fismatecol/>





Cultura

Ciclo de **La arqueología hoy**
Presentación editorial

Presentación editorial

LOS ANIMALES Y EL RECINTO SAGRADO DE TENOCHTITLAN: UNA NUEVA PUBLICACIÓN DE EL COLEGIO NACIONAL



Coordina y participa

Leonardo López Luján*

Participan

Eduardo Matos Moctezuma*

Joaquín Arroyo-Cabrera

Martha-Lorena López Mestas

Pedro Medina-Rosas

Jueves 23 de febrero
6:00 p. m.

Evento 149, Centro Cultural, CDMX
INSTANCIA PRESIDENCIAL, CONVENIO 149
Transmisión en www.youtube.com

*Miembros de El Colegio Nacional



EL COLEGIO NACIONAL

80

AÑOS

Artículo

Past microbial stress benefits tree resilience

Soil microbiota from stressful environments provide an avenue for climate resilience

MICHELLE E. AFKHAM [Authors Info & Affiliations](#)

SCIENCE · 25 May 2023 · Vol 380, Issue 6647 · pp. 798-799 · DOI: 10.1126/science.adf1594

↓ 2,012



CHE

Abstract

By pushing environments to new extremes and exposing organisms to unprecedented levels of stress, anthropogenic changes are threatening biodiversity and ecosystem services. The substantial diversity and long evolutionary history of microorganisms provide a well of biological innovation that has the potential to relieve stress and increase ecosystem resilience (1). On page 835 of this issue, Allsup *et al.* (2) report that soil microbes can relieve climatic stress and enhance tree survival when the microbes have previous experience with that stress (drought or excess heat or cold). They also show that inoculated microbes, including beneficial mycorrhizal fungi, were still detectable in tree roots 3 years after planting in nature. These results suggest that management of soil microbiota, especially during restorations, could provide a valuable strategy for increasing forest resilience to climate change.

The Non-equilibrium Thermodynamics of Natural Selection: from Molecules to the Biosphere

Karo Michaelian

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Abstract: Evolutionary theory suggests that the origin, persistence, and evolution of biology is driven by the “natural selection” of characteristics improving the differential reproductive success of the organism in the given environment. The theory, however, lacks physical foundation, and, therefore, at best, can only be considered a heuristic narrative, of some utility for assimilating the biological and paleontological data at the level of the organism. On deeper analysis, it becomes apparent that this narrative is plagued with problems and paradoxes. Alternatively, non-equilibrium thermodynamic theory, derived from physical law, provides a physical foundation for describing material interaction with its environment at all scales. Here we describe a “natural thermodynamic selection” of characteristics of structures (or processes), based stochastically on increases in the global rate of dissipation of the prevailing solar spectrum. The different mechanisms of thermodynamic selection are delineated for the different biotic-abiotic levels, from the molecular level at the origin of life, up to the level of the present biosphere with non-linear coupling of biotic and abiotic processes. At the levels of the organism and the biosphere, the non-equilibrium thermodynamic description of evolution resembles, respectively, Darwinian and Gaia descriptions, although the underlying mechanisms and the objective function of selection are fundamentally very different.

Keywords: origin of life; evolution; dissipative structuring; prebiotic chemistry; abiogenesis; adenine; biosphere; natural selection

Original Article

Cite this article: G-Santoyo I, Ramírez-Carrillo E, Sanchez JD, and López-Corona O. Potential long consequences from internal and external ecology: loss of gut microbiota antifragility in children from an industrialized population compared with an indigenous rural lifestyle. *Journal of Developmental Origins of Health and Disease* doi: 10.1017/S2040174423000144

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Keywords:

Gut microbiota; antifragility; lifestyles; criticality; ecology

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Oliver López-Corona, Investigadores por México (IxM)-CONACyT, Instituto de Investigaciones en Matemáticas Aplicadas y en

Potential long consequences from internal and external ecology: loss of gut microbiota antifragility in children from an industrialized population compared with an indigenous rural lifestyle

Isaac G-Santoyo^{1,2}, Elvia Ramírez-Carrillo³ , Jonathan Dominguez Sanchez¹ and Oliver López-Corona⁴

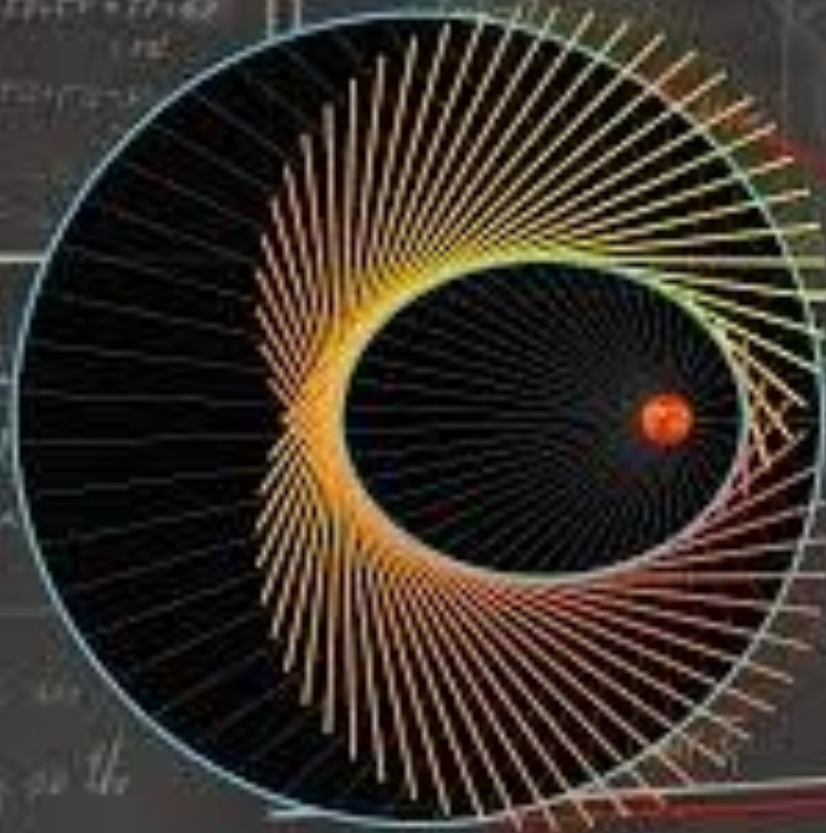
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Abstract

Human health is strongly mediated by the gut microbiota ecosystem, which, in turn, depends not only on its state but also on its dynamics and how it responds to perturbations. Healthy microbiota ecosystems tend to be in criticality and antifragile dynamics corresponding to a maximum complexity configuration, which may be assessed with information and network theory analysis. Under this complex system perspective, we used a new analysis of published data to show that a children's population with an industrialized urban lifestyle from Mexico City exhibits informational and network characteristics similar to parasitized children from a rural indigenous population in the remote mountainous region of Guerrero, México. We propose then, that in this critical age for gut microbiota maturation, the industrialized urban lifestyle could be thought of as an external perturbation to the gut microbiota ecosystem, and we show that it produces a similar loss in criticality/antifragility as the one observed by internal perturbation due to parasitosis by the helminth *A. lumbricoides*. Finally, several general complexity-based guidelines to prevent or restore gut ecosystem antifragility are discussed.

Videos

Feynman's Lost Lecture



Libros

Lecture Notes in Mathematics 2185

Bernard Candelpergher

Ramanujan Summation of Divergent Series

 Springer

"An epic page-turner." —WILLIAM D. COHAN, bestselling author of
POWER FAILURE and *HOUSE OF CARDS*

CHAOS KINGS

HOW WALL STREET TRADERS
MAKE BILLIONS IN
THE NEW AGE OF CRISIS



SCOTT PATTERSON

New York Times Bestselling Author of
THE QUANTS and **DARK POOLS**

Notas



EL INSTITUTO DE GEOLOGÍA

Lamenta el sensible fallecimiento del doctor

Óscar Arnoldo Escolero Fuentes



Ocurrido en la mañana del 21 de mayo
del presente año 2023,
en la Ciudad de México.

El doctor Escolero fue investigador
del Instituto de Geología y se destacó
en el área de la hidrogeología
y en diversos aspectos ambientales
del agua subterránea.



NatlAcad of Sciences

@theNASciences



After 66 years at @MIT, #NASmember Gilbert Strang gave his final lecture last month and received a heartwarming standing ovation. See the viral video and read more about his career and impact on the MIT #mathematics department in @USATODAY:

Traducir Tweet



Gil Strang's Final 18.06 Linear Algebra Lecture

$$\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 19 \\ 17 \\ 14 \end{bmatrix}$$

$$\begin{bmatrix} 3 & 7 & 37 & 57 \\ 4 & 9 & 48 & 74 \end{bmatrix} \begin{bmatrix} x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$Ax=0$