

FisMatEcol Boletín

Septiembre 2023

Dr. Oliver López Corona
Dra. Elvia Ramírez Carrillo



Eventos



Ciudades en Volcanes 12 Volcanes y Sociedad

Antigua Guatemala, Feb. 11-17, 2024

Fechas importantes:

- 21 de agosto: Publicación de las sesiones de la conferencia y apertura de la convocatoria para **presentación de resúmenes** en <https://congress.iavceivolcano.org/conference-program/>.
- 30 de agosto: Cierre de la convocatoria para enviar **propuestas de talleres y excursiones** pre y post conferencia en: <https://congress.iavceivolcano.org/field-trips-and-workshops/>.
- 6 de octubre: Cierre de la convocatoria para presentar **resúmenes**.

Los cuatro grandes temas de COV12 son:

Volcanes y desarrollo
sostenible

Volcanes, las humanidades y
las artes creativas

Volcanes y su contexto social,
cultural y político

Del monitoreo volcánico y la
evaluación de la amenaza a la
gestión del riesgo

Preguntas/información:

cov12antigua@gmail.com

<http://cov12.org>

Síguenos en:

@citiesonvolcanoes12



@COVolcanoes12





VIII Encuentro de Modelado Matemático en Física y Geometría

Universidad Autónoma Metropolitana Azcapotzalco
4, 5 y 6 de Diciembre de 2023
Encuentro híbrido

Registro: <http://bit.ly/3EvkSZR>

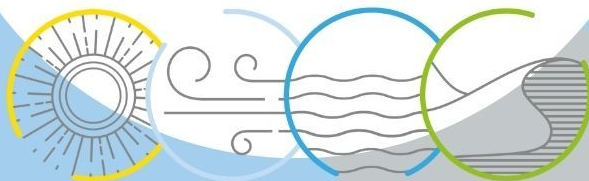
Deadline para someter resúmenes: 6 de Octubre

AVISO:



SISTEMA DE REGISTRO DE INSCRIPCIONES ABIERTO

**INSCRÍBETE ANTES DEL 10 DE SEPTIEMBRE
Y OBTÉN UN PRECIO ESPECIAL**



Interacción de los sistemas terrestres

RAUGM 2023

Celebrando el 50 aniversario del CICESE

RAUGM.ORG.MX/PARTICIPANTES



35 Foro Nacional de Estadística



Instituto de
Matemáticas

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La **Asociación Mexicana de Estadística** tiene el agrado de convocar a estudiantes, investigadores y profesionales de la estadística y áreas afines al

35 Foro Nacional de Estadística

Del 27 al 29 de septiembre de 2023

Sede: Unidad Cuernavaca del Instituto de Matemáticas, UNAM

Te invitan al

SEGUNDO

CONGRESO INTERNACIONAL

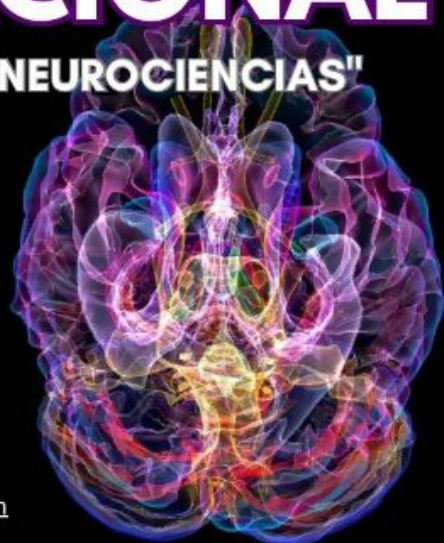
"FRONTERAS DE LAS NEUROCIENCIAS"

¡ESPÉRALO
MUY PRONTO!

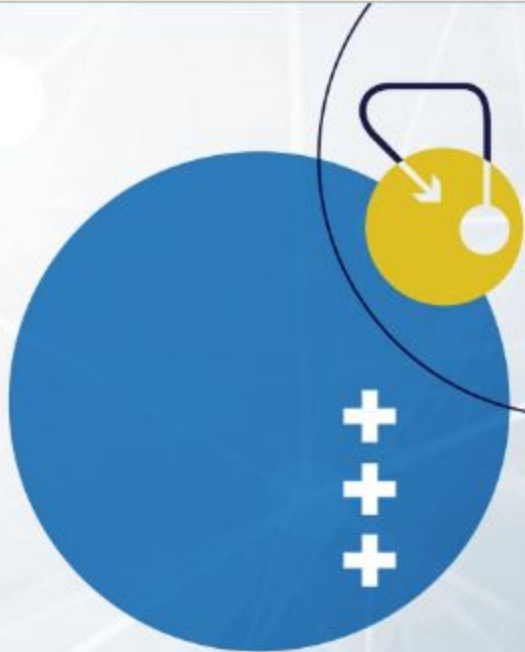
Del 27 al 29 de Septiembre

¡Evento Gratuito!

Registro a través de la página web:
<https://www.neurocienciasunam.com>



Evento impulsado por los proyectos: PAPIIME PE308423, PAPIIT IN216023, CONACYT 263577



NetSci[®] 2024

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Conference on Network Science**

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Oportunidades



FONDO MEXICANO
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INSTITUCIÓN PRIVADA

FMCN

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proyecto ACCIÓN

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para más información

Fecha límite para aplicar: 29 de septiembre de 2023

Paulina Cerna



Graduate Student Funding Opportunities

Download the most recent file here:

[Graduate Student Funding Opportunities](#)

(xlsx file; updated September 6, 2023)

This is a continuously updated repository of federal and private funding opportunities that are intended for graduate students. The opportunities are pre-sorted chronologically and alphabetically, and can be searched by funding amount and subject matter.

Although every effort has been made to ensure accuracy, please refer to the sponsor's funding announcement for complete details on each opportunity.

If you would like to add an opportunity to the list or have any questions, please contact

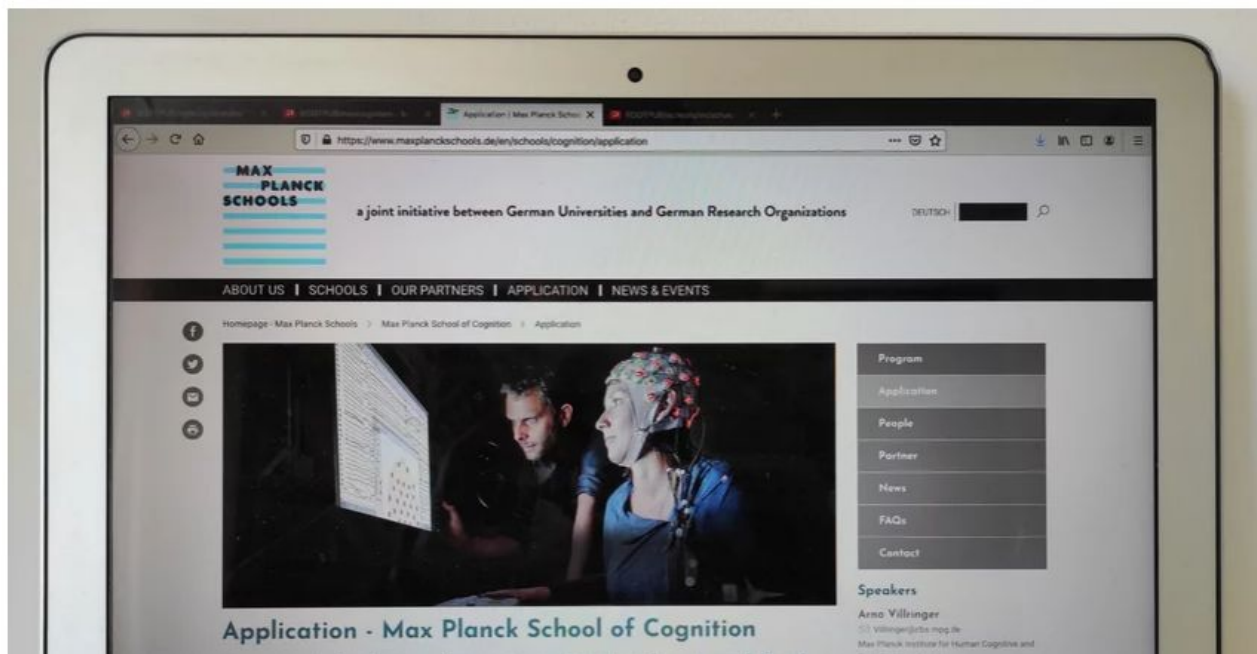


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Conceptos

AI-ChatGPT





Enrique Hernández-Lemus @Iehchel · 25 ago.



Toda la ciencia experimental cuantitativa y todo el machine learning cuelgan del teorema de Glivenko y Cantelli (GC) y resulta que no lo conocen.

Se los presento. Si lo entienden bien, ya no sufrirán buscando “el estadístico correcto” nunca más.



en.m.wikipedia.org

Glivenko–Cantelli theorem - Wikipedia

Simetrías

Escuchando a la naturaleza:

¿el corazón tiene memoria?

La simetría y las señales de la vida

Miércoles 23 de agosto · 6:00 p. m.



ENTRADA LIBRE

Dirección: ICA, Centro Histórico, CDISC
Además, transmisible en línea
Consulta completa en cefnah.mx



Balance

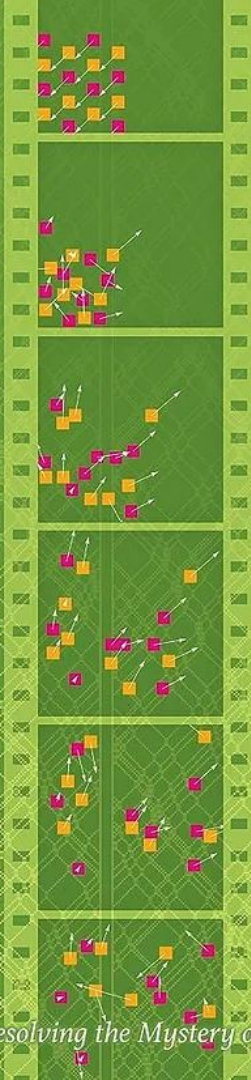
▶ Carlos Gershenson on Balance, Criticality, Antifragility, and The Philosophy of Complex Systems

COMPLEXITY
by the Santa Fe Institute

CARLOS GERSHENSON
on Balance, Criticality, Antifragility,
and The Philosophy of Complex Systems

Listen on
Apple Podcasts

The image shows a podcast player interface. At the top, there is a play button icon followed by the title "Carlos Gershenson on Balance, Criticality, Antifragility, and The Philosophy of Complex Systems". Below the title is a white audio waveform. In the center, a smartphone displays the podcast cover art, which features a portrait of Carlos Gershenson and the text "COMPLEXITY by the Santa Fe Institute" and "CARLOS GERSHENSON on Balance, Criticality, Antifragility, and The Philosophy of Complex Systems". In the bottom right corner, there is a purple Apple Podcasts logo with the text "Listen on Apple Podcasts". The background of the player is a light blue and white geometric pattern.



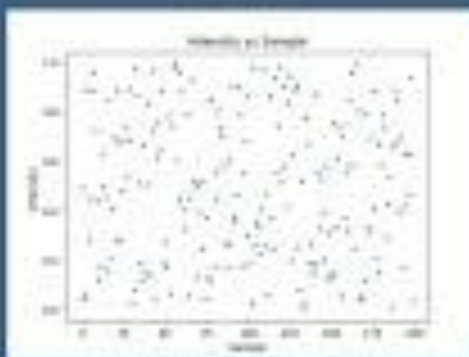
STEPHEN
WOLFRAM

THE
SECOND
LAW

Resolving the Mystery of the Second Law of Thermodynamics

Cursos

Gráficos de dispersión de datos univariados





<https://github.com/uganoma/Bioinformatics>



```
LA TERMINAL DE R
```

```
-bash: r: command not found
```

Que quiere decir que no existe el comando "r" ya

De igual forma al poner `ls r` (incluyendo el `ls`) te dirá que no existe el comando `r`, aunque `ls` sí sea un comando.

La práctica hace al maestro: a continuación veremos algunos de los comandos básicos, pero para practicar más, la primera tarea será resolver los siguientes cursos prácticos:

- Terminar el curso [Learn the Command Line de Codecademy](#)
- Adentrarse en el mundo del [shell](#) (curso de bash).

La terminal de R

R es un programa que funciona con la línea de comandos y por lo tanto puede correrse desde la terminal de varias formas o en su propia terminal:

```
R
R version 3.3.2 (2016-05-18) -- "Fire Safety"
Copyright (C) 2016 The R Foundation for Statistical Computing
Platform: x86_64-suse-linux-gnu64-bit, R 3.3.2

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
```

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aplicadas a la ecología

VIRTUAL

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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/>







Curso semestral 2021-2

INTRODUCCIÓN A LA COMPLEJIDAD

Materia optativa de la Facultad de Ciencias - UNAM

Maximino Aldana

Instituto de Ciencias Físicas y Centro de Ciencias de la Complejidad de la UNAM

02/MAR/21

SESIÓN - 01 ▼



Cultura

BI

Time

Entropy

Life

The Multiverse

Free Will





FESTIVAL
DE ARTE
Y CIENCIA

el
aleph

22 – 26 mayo, 2019



Jessica Machnicki

Stephanie King



How Randomness Improves Algorithms



Unpredictability can help computer scientists solve otherwise intractable problems.



Artículo



Unveiling global species abundance distributions

Received: 29 April 2023

Accepted: 18 July 2023

Published online: 04 September 2023

 Check for updates

Corey T. Callaghan^{1,2,3}✉, Luís Borda-de-Água^{4,5,6}, Roel van Klink^{1,7},
Roberto Rozzi^{1,8,9} & Henrique M. Perelra^{1,2,4}

Whether most species are rare or have some intermediate abundance is a long-standing question in ecology. Here, we use more than one billion observations from the Global Biodiversity Information Facility to assess global species abundance distributions (gSADs) of 39 taxonomic classes of eukaryotic organisms from 1900 to 2019. We show that, as sampling effort increases through time, the shape of the gSAD is unveiled; that is, the shape of the sampled gSAD changes, revealing the underlying gSAD. The fraction of species unveiled for each class decreases with the total number of species in that class and increases with the number of individuals sampled, with some groups, such as birds, being fully unveiled. The best statistical fit for almost all classes was the Poisson log-normal distribution. This strong evidence for a universal pattern of gSADs across classes suggests that there may be general ecological or evolutionary mechanisms governing the commonness and rarity of life on Earth.

[Submitted on 10 Aug 2023]

Thermodynamic Linear Algebra

Maxwell Aifer, Kaelan Donatella, Max Hunter Gordon, Thomas Ahle, Daniel Simpson, Gavin E. Crooks, Patrick J. Coles

Linear algebraic primitives are at the core of many modern algorithms in engineering, science, and machine learning. Hence, accelerating these primitives with novel computing hardware would have tremendous economic impact. Quantum computing has been proposed for this purpose, although the resource requirements are far beyond current technological capabilities, so this approach remains long-term in timescale. Here we consider an alternative physics-based computing paradigm based on classical thermodynamics, to provide a near-term approach to accelerating linear algebra.

At first sight, thermodynamics and linear algebra seem to be unrelated fields. In this work, we connect solving linear algebra problems to sampling from the thermodynamic equilibrium distribution of a system of coupled harmonic oscillators. We present simple thermodynamic algorithms for (1) solving linear systems of equations, (2) computing matrix inverses, (3) computing matrix determinants, and (4) solving Lyapunov equations. Under reasonable assumptions, we rigorously establish asymptotic speedups for our algorithms, relative to digital methods, that scale linearly in matrix dimension. Our algorithms exploit thermodynamic principles like ergodicity, entropy, and equilibration, highlighting the deep connection between these two seemingly distinct fields, and opening up algebraic applications for thermodynamic computing hardware.

Is the placebo powerless? Update of a systematic review with 52 new randomized trials comparing placebo with no treatment

A. HRÓBJARTSSON & P. C. GÖTZSCHE

From The Nordic Cochrane Centre, Rigshospitalet, Copenhagen, Denmark

Abstract. Hróbjartsson A, Gøtzsche PC (The Nordic Cochrane Centre, Copenhagen Ø, Denmark). Is the placebo powerless? Update of a systematic review with 52 new randomized trials comparing placebo with no treatment (Review). *J Intern Med* 2004; 256: 91–100.

Background. It is widely believed that placebo interventions induce powerful effects. We could not confirm this in a systematic review of 114 randomized trials that compared placebo-treated with untreated patients.

Aim. To study whether a new sample of trials would reproduce our earlier findings, and to update the review.

Methods. Systematic review of trials that were published since our last search (or not previously identified), and of all available trials.

Results. Data was available in 42 out of 52 new trials (3212 patients). The results were similar to our previous findings. The updated review summarizes data from 156 trials (11 737 patients). We found no statistically significant pooled effect in 38 trials with

binary outcomes, relative risk 0.95 (95% confidence interval 0.89–1.01). The effect on continuous outcomes decreased with increasing sample size, and there was considerable variation in effect also between large trials; the effect estimates should therefore be interpreted cautiously. If this bias is disregarded, the pooled standardized mean difference in 118 trials with continuous outcomes was -0.24 (-0.31 to -0.17). For trials with patient-reported outcomes the effect was -0.30 (-0.38 to -0.21), but only -0.10 (-0.20 to 0.01) for trials with observer-reported outcomes. Of 10 clinical conditions investigated in three trials or more, placebo had a statistically significant pooled effect only on pain or phobia on continuous scales.

Conclusion. We found no evidence of a generally large effect of placebo interventions. A possible small effect on patient-reported continuous outcomes, especially pain, could not be clearly distinguished from bias.

Keywords: meta-analysis, pain, placebo effect, placebos, systematic review.

Criticality in a multisignal system using principal component analysis

Miguel Sánchez-Islas, Juan Claudio Toledo-Roy, and Alejandro Frank
Phys. Rev. E **103**, 042111 – Published 6 April 2021

Article

References

Citing Articles (3)

Supplemental Material

PDF

HTML

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ABSTRACT

In systems with dynamical transitions, criticality is usually defined by the behavior of suitable individual variables of the system. In the case of time series, the usual procedure involves the analysis of the statistical properties of the selected variable as a function of a control parameter in both the time and frequency domains. An interesting question, however, is how to identify criticality when multiple simultaneous signals are required to provide a reliable representation of the system, especially when the signals exhibit different dynamics and do not individually display the characteristic signs of criticality. In that situation, a technique that analyzes the collective behavior of the signals is necessary. In this work we show that the eigenvalues and eigenvectors obtained from principal components analysis (PCA) can be used as a way to identify collective criticality. To do this, we construct a multilayer Ising model comprised of coupled two-dimensional Ising lattices that have distinct critical temperatures when isolated. We apply PCA to the collection of magnetization signals for a range of global temperatures and study the resulting eigenvalues. We find that there exists a single global temperature at which the eigenvalue spectrum follows a power law, and identify this as an indicator of "multicriticality" for the system. We then apply the technique to electroencephalographic recordings of brain activity, as this is a prime example of multiple signals with distinct individual dynamics. The analysis reveals a power-law eigenspectrum, adding further evidence to the brain criticality hypothesis. We also show that the eigenvectors can be used to distinguish the recordings in the resting state from those during a cognitive task, and that there is important information contained in all eigenvectors, not just the first few dominant ones, establishing that PCA has great utility beyond dimensional reduction.

Videos



Escuela de Gobierno @EGobiernoTP · 30 ago.

...

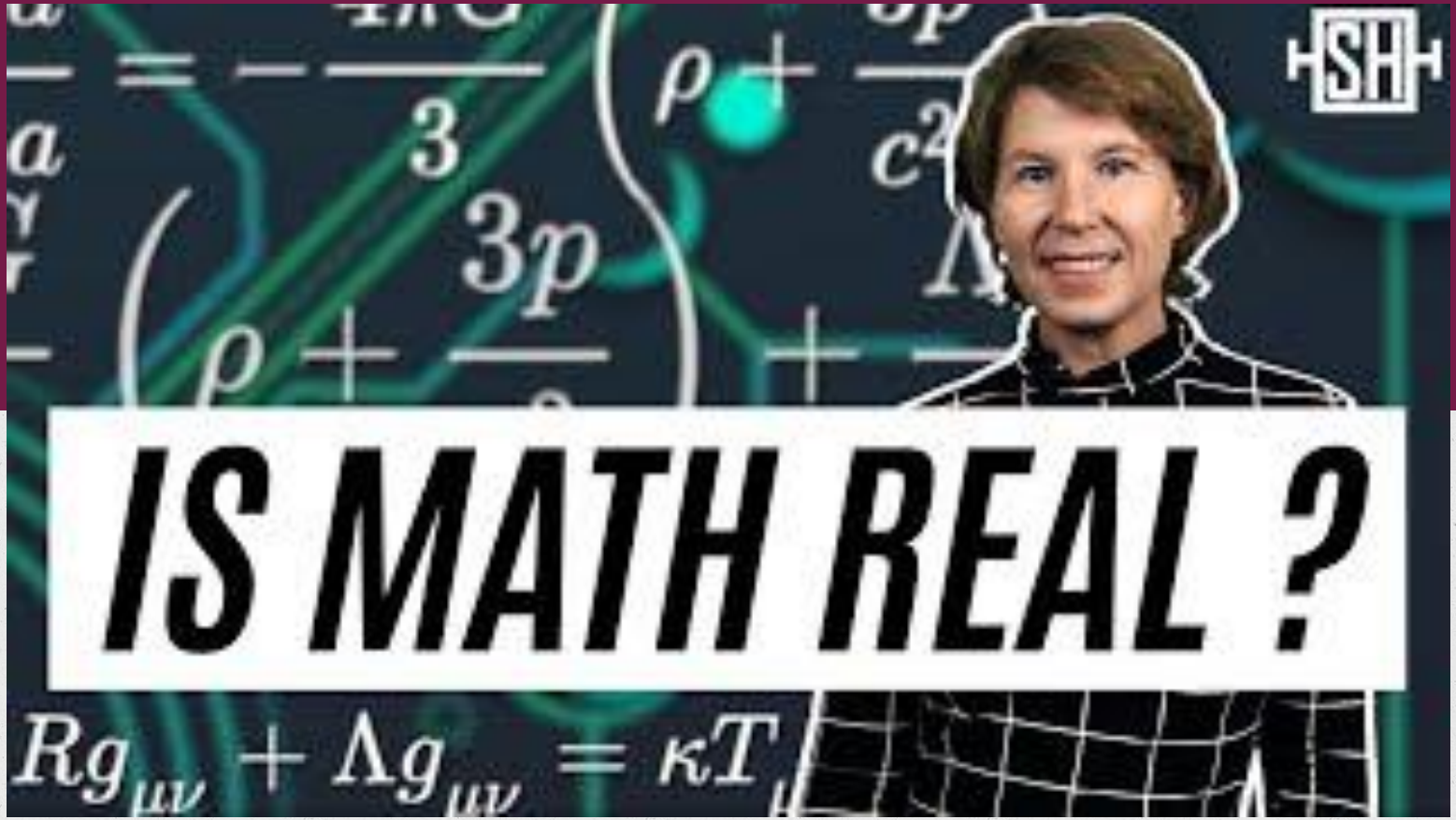
Hoy en @TheDataPub, el Dr. Oliver López-Corona (@otrasenda_AC) habló del peligro de las narrativas falsas basadas en datos; se refirió a los límites de la inferencia en sistemas complejos, así como a las fallas típicas en el razonamiento estadístico y probabilístico.





SISTEMAS COMPLEJOS





IS MATH REAL ?

$$Rg_{\mu\nu} + \Lambda g_{\mu\nu} = \kappa T_{\mu\nu}$$



Conectividad funcional cerebral



The banner features a dark blue background with white text and logos. At the top, there is an orange horizontal bar containing logos for UNAM, the Center for Neuroscience, and the Institute of Neurobiology, along with the text 'SEMINARIO DE NEUROCIENCIAS'. Below this, the title 'DESARROLLO DE LA CONECTIVIDAD FUNCIONAL CEREBRAL EN LA INFANCIA Y ADOLESCENCIA' is written in large, bold, white capital letters. To the right of the title is a portrait of Sarael Alcauter, a man with a beard and mustache, wearing a light-colored shirt. Below the title, the speaker's name 'Sarael Alcauter' is followed by 'Instituto de Neurobiología-UNAM'. At the bottom, an orange bar contains the event details: 'Viernes 25 de agosto de 2023', '10-12 horas', 'Auditorio del C3', and 'Transmisión por YouTube del C3'.

SEMINARIO DE NEUROCIENCIAS

**DESARROLLO DE LA CONECTIVIDAD
FUNCIONAL CEREBRAL EN LA
INFANCIA Y ADOLESCENCIA**

Sarael Alcauter Instituto de Neurobiología-UNAM

Viernes 25 de agosto de 2023 • 10-12 horas • Auditorio del C3 • Transmisión por YouTube del C3

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A PhD IS NOT ENOUGH!

*A Guide to Survival
in Science*



REVISED
EDITION

PETER J. FEIBELMAN

Notas



sciencenews.org

Freezing adult corals could help ensure they survive a changing climate

Chunks of living corals could be frozen for safekeeping and revived later to restore reef ecosystems that are withering in warming seas.



[sciencenews.org](https://www.sciencenews.org)

When discussing flora and fauna, don't forget 'funga'

Conservation efforts often overlook fungi. That can change by using "mycologically inclusive language," researchers say.



wionews.com

Scientists find that Apollo 17's left-over tech causing moonquakes on...

A new study by researchers from the California University of Technology has revealed that the Apollo's left-over lunar module is ...



podcasters.spotify.com

Science News Sep 12, 2023 by Science with Sabine

Today we talk about a bubble of galaxies, a climate scientist who made his own paper worse, double magic oxygen, a chemical reaction ...