

# FisMatEcol Boletín

Enero 2024

Dr. Oliver López Corona  
Dra. Elvia Ramírez Carrillo



Eventos

SEMINARIO PERMANENTE  
LA CIENCIA ES TU DERECHO

ENCUENTRO  
ACADÉMICO

## Los neuroderechos frente a la maquinización del mundo



Martes 23 y jueves 25 de enero del 2024  
9:00 a 14:30 h



Salón Heberto Castillo

Edificio B, 3er piso de la Honorable Cámara de Diputados  
Av. Congreso de la Unión N° 66 Col. El Parque Alcaaldía Venustiano  
Carranza. C.P. 15960 Ciudad de México

 LIVE @Conahcymx  Live Conahcymx





# SEMINARIO DE NEUROCIENCIAS

Coordinan: Markus F - Müller, [muellerm@uaem.mx](mailto:muellerm@uaem.mx)

Román Rossi Pool, [romanr@ifc.unam.mx](mailto:romanr@ifc.unam.mx)



Último viernes de cada mes • 10 - 12 horas • Evento presencial y transmisión por YouTube del C3

# Undergraduate Complexity Research



Detail from Plant forms, an Impression Figure by Margaret Watts Hughes, pigment on glass, date unknown (recolored). Courtesy of Cyfarthfa Castle Museum and Art Gallery via [PublicDomainReview.org](http://PublicDomainReview.org)

A Research Experience for Undergraduate Students

# Complex Systems Summer School

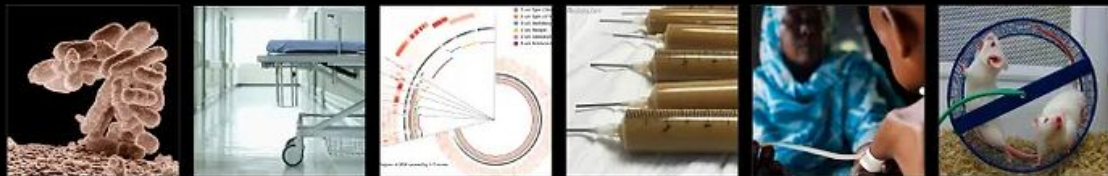


Study Complex Behaviors Across Systems

Oportunidades



# THE BRITO LAB



**Cornell**Engineering

Nancy E. and Peter C. Meinig School of Biomedical Engineering

## → RECENT NEWS

Postdoc position available in the lab  
Also currently recruiting grad students!





COLLEGE OF AGRICULTURAL SCIENCES »

DEPARTMENT OF BIOLOGICAL & ECOLOGICAL ENGINEERING



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## Assistant Professor of Psychology

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Please see Special Instructions for more details.

To apply, please visit <https://jobs.cnu.edu/postings/> to upload a letter of interest, current curriculum vitae, graduate transcripts (photocopies acceptable for initial screening), statement of teaching philosophy, research statement, a one-page statement articulating how your teaching, scholarship and service would contribute toward fostering an inclusive learning environment on campus, evidence of teaching effectiveness, and a list of three references. Three letters of recommendation will be required if selected for on-campus interview. (Letters should be uploaded with application materials or emailed to [facultyrecruitment@cnu.edu](mailto:facultyrecruitment@cnu.edu) if submitted after the application deadline).

Review of applications will begin at 11:59 PM ET on January 28, 2024.  
Applications received after 11:59 PM ET on January 28, 2024 will be accepted but considered only if needed.

Search finalists are required to complete a CNU sponsored background check.

Christopher Newport University (CNU) will make a reasonable effort to accommodate persons with disabilities in the application and/or interview process. Persons with disabilities who require accommodation should contact the CNU Human Resources Office by calling (757) 594-7145.

### Posting Details

#### Position Information

Working Title      Assistant Professor of Psychology

Conceptos

## Decálogo de la mentalidad adecuada

1. Haz de la IA tu asistente, no tu jefe.
2. Utiliza la IA para estructurar, no para crear contenido.
3. No dependas en exceso de la IA y no olvides usar el sentido común.
4. No escribas órdenes de baja calidad y esperes resultados de alta calidad.
5. Prioriza la calidad sobre la velocidad.
6. Reconoce la influencia de la calidad/cantidad/diversidad de los datos y algoritmos.
7. No pidas información que no puedas verificar, especialmente para tareas importantes.
8. Diversifica tus fuentes para obtener perspectivas más completas.
9. Fomenta la ética y la responsabilidad en la aplicación de la IA.
10. Fomenta la interpretabilidad y explicabilidad.

CHOOSE YOUR CHARACTER!



Tit for Tat  
Copies up



Friedman  
Is grudges

# Correlation and Causation

## Misuse and Misconception of Statistical Facts

A quote on *statistical lack of interest* in *Wired* magazine on the part of an *American Schoolteacher*, that, perhaps innocently, misled me, serves as a warning how easily we may be duped with scientifically sounding facts and numbers. Given the amount of statistical facts and their wide spread exploitation by the mass media, it surely pays to be at least aware of the dangers. Below I collected excerpts from three books that (in part) are concerned with this phenomenon.



Following is an excerpt from

*J. A. Paulos,*  
*Beyond Numeracy*

Cursos

Amigos, están invitados a nuestro curso en línea, dentro del posgrado de la UNAM, sobre "Complejidad en Ecología, que nos puede decir la física sobre la salud de los ecosistemas" cuyo temario está aquí: [https://pcbiol.posgrado.unam.mx/programas\\_cursos/2024-2/complejidad\\_en\\_ecologia\\_que\\_nos\\_puede\\_decir\\_la\\_fisica\\_sobre\\_la\\_salud\\_de\\_los\\_ecosistemas.pdf](https://pcbiol.posgrado.unam.mx/programas_cursos/2024-2/complejidad_en_ecologia_que_nos_puede_decir_la_fisica_sobre_la_salud_de_los_ecosistemas.pdf)

TEMAS SELECTOS: COMPLEJIDAD EN ECOLOGIA, QUE NOS PUEDE DECIR LA FISICA SOBRE LA SALUD DE LOS ECOSISTEMAS								
ENTIDAD	ASIG	GPO	CUPO	PROFESORES		CORREO ELECTRÓNICO		
3	4199 75670	4199 T372	5	DR. OLIVER XAVIER LOPEZ CORONA		lopezoliverx@ciencias.unam.mx		
				DRA. ELVIA MARIA RAMIREZ CARRILLO		elviarc@gmail.com		
<b>HORARIO</b> Lu y Mi de 10 a 12 hrs En línea Instituto de Ecología UNAM								
<b>CAMPO DE CONOCIMIENTO:</b>		BEV	BEX	BIO	ECO	MIE	SIS	<a href="#">DESCARGA PROGRAMA</a>
<b>REQUISITOS:</b>								
<b>OBSERVACIONES:</b> Antes de hacer la inscripción formalmente en SAEP, deberá confirmar con el profesor su lugar, así como los detalles de impartición del curso.								

Para oyentes: <https://forms.gle/GqyVDfRvMLBaM4GL9>





# 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/>







Mi propuesta de que es lo que debería enseñarse y cómo.





Cultura



# SEBRADORAS DE VIDA

UNA PELICULA DE ALVARO + DIEGO SARMIENTO





# HOW TO THRIVE IN 2024

MATT MULLENWEG | THE TIM FERRISS SHOW



Artículo

# Why the simplest explanation isn't always the best

Eva L. Dyer and Konrad Kording  [Authors Info & Affiliations](#)

December 20, 2023 | 120 (52) e2319169120 | <https://doi.org/10.1073/pnas.2319169120>

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 11,885



As datasets in neuroscience increase in size and complexity, interpreting these high-dimensional data is becoming more critical. However, developing an intuition for patterns or structures in such datasets is hard. Dimensionality reduction methods aim to find patterns in these high-dimensional datasets, sometimes transforming them into simpler and more “interpretable” descriptions of the data (1). However, as Shinn in PNAS (2) underscores, what feels intuitive and simple can often mislead: Dimensionality reduction optimizes for specific statistical features of the data and doesn't always agree with the most intuitive explanation.

Principal components analysis (PCA) is one of the most widely used dimensionality reduction techniques due to its conceptual simplicity and utility in data interpretation. The first principal component is defined as the direction of unit length that captures the maximum variance in the data, and the second principal component is the direction, orthogonal to the first, that captures the maximum remaining variance. This process continues for additional components, each capturing the maximum variance under the constraint of orthogonality to the previous components. When finished, this approach builds an orthogonal basis which constrains the collection of generator elements to have a particular geometry (Fig. 1). The principal components describe the data, but depending on the structure of the data, they may not align

# Antifragility as a complex system's response to perturbations, volatility, and time

Cristian Axenie<sup>1</sup>, Oliver López-Corona<sup>2</sup>, Michail A. Makridis<sup>3</sup>, Melsam Akbarzadeh<sup>4</sup>, Matteo Saveriano<sup>5</sup>, Alexandru Stancu<sup>6</sup>, and Jeffrey West<sup>7,\*</sup>

<sup>1</sup>Department of Computer Science and Center for Artificial Intelligence, Nuremberg Institute of Technology Georg Simon Ohm, Nuremberg, Germany

<sup>2</sup>Investigadores por México (IxM) at Instituto de Investigaciones en Matemáticas Aplicadas y Sistemas (IIMAS), Universidad Nacional Autónoma de México (UNAM), Ciudad Universitaria, CDMX, México

<sup>3</sup>IVT, Civil Environmental and Geomatic Engineering, ETH Zurich, Switzerland

<sup>4</sup>Department of Transportation Engineering, Isfahan University of Technology, Isfahan, Iran

<sup>5</sup>Department of Industrial Engineering, University of Trento, Trento, Italy

<sup>6</sup>Department of Electrical and Electronic Engineering, The University of Manchester, Manchester, UK

<sup>7</sup>Department of Integrated Mathematical Oncology, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL, USA

\*jeffrey.west@moffitt.org

## ABSTRACT

Antifragility characterizes the benefit of a dynamical system derived from the variability in environmental perturbations. Antifragility carries a precise definition that quantifies a system's output response to input variability. Systems may respond poorly to perturbations (fragile) or benefit from perturbations (antifragile). In this manuscript, we review a range of applications of antifragility theory in technical systems (e.g., traffic control, robotics) and natural systems (e.g., cancer therapy, antibiotics). While there is a broad overlap in methods used to quantify and apply antifragility across disciplines, there is a need for precisely defining the scales at which antifragility operates. Thus, we provide a brief general introduction to the properties of antifragility in applied systems and review relevant literature for both natural and technical systems' antifragility. We frame this review within three scales common to technical systems: intrinsic (input-output nonlinearity), inherited (extrinsic environmental signals), and interventional (feedback control), with associated counterparts in biological systems: ecological (homogeneous systems), evolutionary (heterogeneous systems), and interventional (control). We use the common noun in designing systems that exhibit antifragile behavior across scales and guide the reader along the spectrum of fragility–adaptiveness–resilience–robustness–antifragility, the principles behind it, and its practical implications.

## 1 Introduction

**A**NTIFRAGILE is a term coined to describe the opposite of fragile, as defined in a recent book that generated significant interest in both the public and scientific domain<sup>1</sup>. Although the term has a wide range of applications, it contains a precise and mathematical definition. Systems or organisms can be defined as antifragile if they derive benefit from systemic variability,

# Complexity Thought: 2023 Influential Papers Collection

Unraveling complexity: building knowledge, one paper at a time



MANLIO DE DOMENICO

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# Prevolutionary dynamics and the origin of evolution

Martin A. Nowak  and Hisashi Ohtsuki [Authors Info & Affiliations](#)

September 30, 2008 | 105 (39) 14924-14927 | <https://doi.org/10.1073/pnas.0806714105>

 8,278 | 70



## Abstract

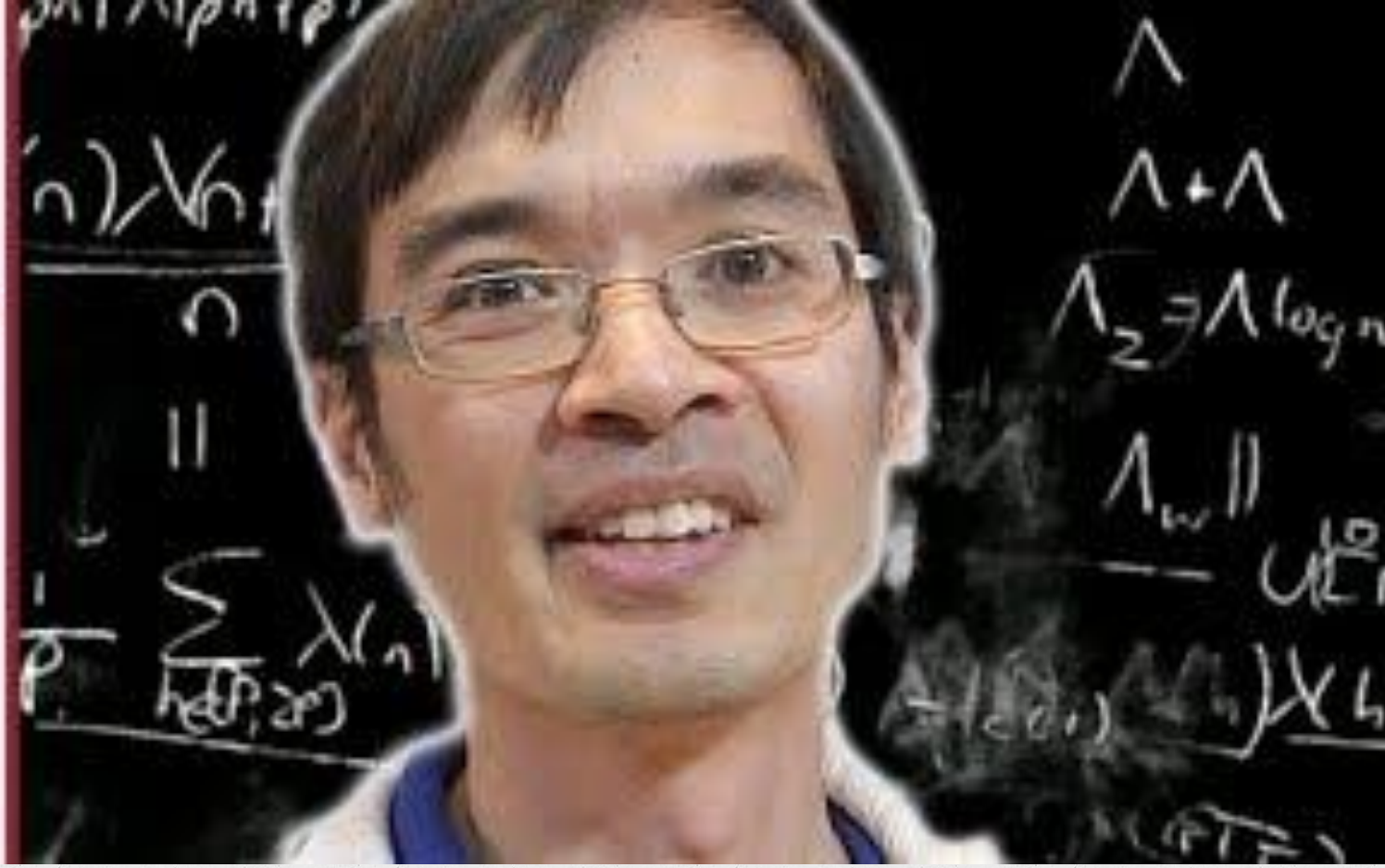
Life is that which replicates and evolves. The origin of life is also the origin of evolution. A fundamental question is when do chemical kinetics become evolutionary dynamics? Here, we formulate a general mathematical theory for the origin of evolution. All known life on earth is based on biological polymers, which act as information carriers and catalysts. Therefore, any theory for the origin of life must address the emergence of such a system. We describe prelife as an alphabet of active monomers that form random polymers. Prelife is a generative system that can produce information. Prevolutionary dynamics have selection and mutation, but no replication. Life marches in with the ability of replication: Polymers act as templates for their own reproduction. Prelife is a scaffold that builds life. Yet, there is competition between life and prelife. There is a phase transition: If the effective replication rate exceeds a critical value, then life outcompetes prelife. Replication is not a prerequisite for selection, but instead, there can be selection for replication. Mutation leads to an error threshold between life and prelife.

Videos



*The End*  
**of Science**

# Numberphile







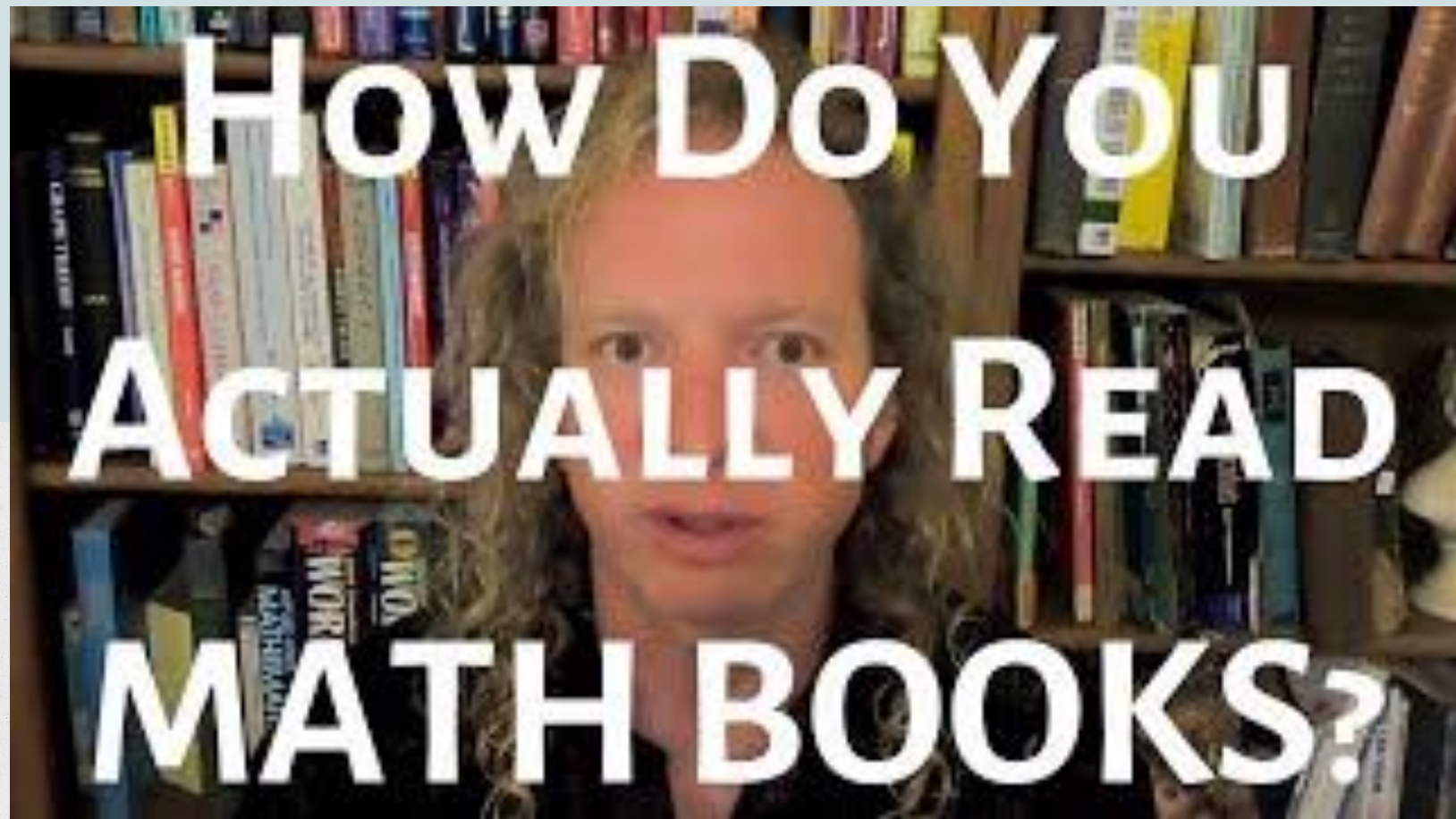
**Escuela de Gobierno** @EGobiernoTP · 30 ago.

...

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.



Libros



**How Do You**

**ACTUALLY READ**

**MATH BOOKS?**

# CUT THE --- KNOT

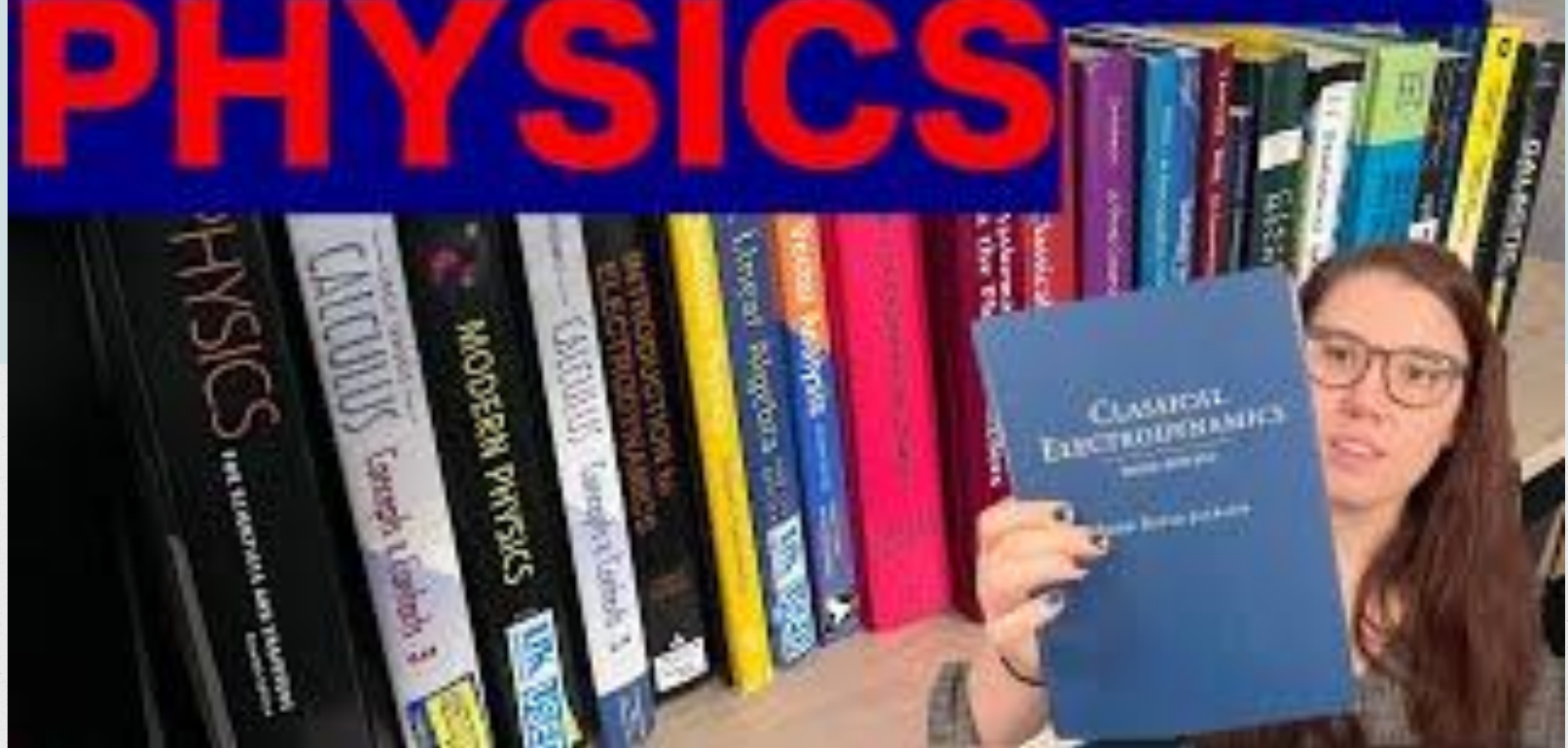


Probability Riddles

Alexander Bogomolny

With Foreword by **NASSIM NICHOLAS TALEB**

# HOW TO TEACH YOURSELF PHYSICS



<https://salmanisaleh.files.wordpress.com/2019/02/physics-for-scientists-7th-ed.pdf>

"For the Love of Physics captures Walter Lewin's extraordinary intellect, passion for physics, and brilliance as a teacher. Hopefully, this book will bring even more people into the orbit of this extraordinary educator and scientist." —Bill Gates

FOR THE  
LOVE OF  
PHYSICS



From the End of the Rainbow to the  
Edge of Time—A Journey Through  
the Wonders of Physics

Walter Lewin

with Warren Goldstein

# The Re-Read List (RRL)

**C**ontrary to those never ending reading lists, in here we will only share Lindy books that deserve not only to be read but re-read several times. Those books that renew themselves when reopened, in which you may find new hidden details or deeper layers of knowledge.

by

Giovanni H. Uribe & Oliver López-Corona

Notas



The Year in

# MATHEMATICS



The Year in

# PHYSICS



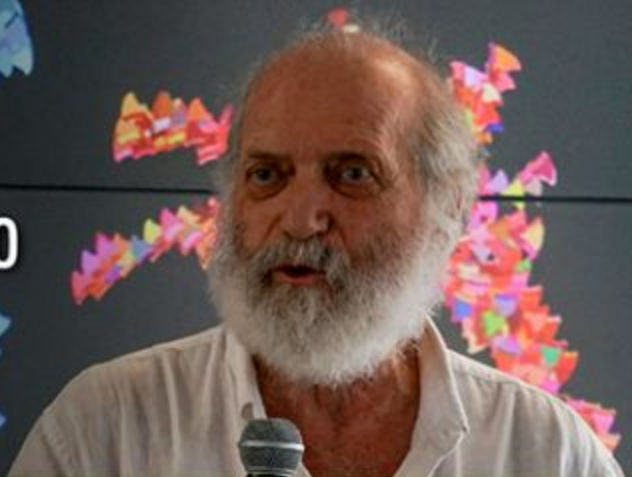


The Year in

**BIOLOGY**



# Martínez Mekler, pionero de la complejidad, es reconocido con Premio al Desarrollo de la Física



Noticia 272/2023

25 de octubre de 2023 ▼