



On the Gravitomagnetic Origins of the Anomalous Flat Rotation Curves of Spiral Galaxies

G.G. Nyambuya

Contenido:

1 **On the Gravitomagnetic Origins of the Anomalous Flat Rotation Curves of Spiral Galaxies**

1 **Adaptation to climate change at local level in Europe: An overview**

2 **The morphological study of spiral/lenticular galaxies in some pairs**

2 **Radiation Effects on Satellites During Extreme Space Weather Events**

3 **The FGOALS climate system model as a modeling tool for supporting climate sciences: An overview**

3 **Nonlinear Long-Term Large Watershed Hydrologic Response to Wildfire and Climatic Dynamics Locally Increases Water Yields**

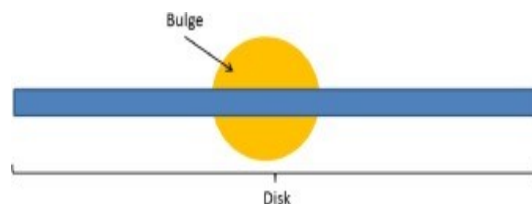
4 **Characterization of the depocenters and the basement structure, below the central Chile Andean Forearc: A 3D geophysical modelling**

5 **NOTICIAS**

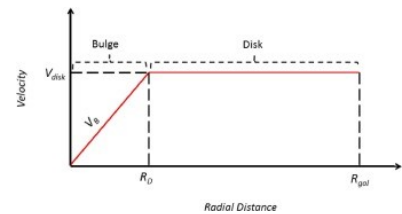
6 **CONGRESOS**

Resumen

We demonstrate that in-principle, one of the five solutions presented in the reading Nyambuya (2015b), i.e., a solution of the Four Poisson-Laplace equation of gravitation [or Nordström (1912) equation of gravitation] can be used to explain the anomalous flat rotation curves of spiral galaxies. The proposed solution does not invoke the exotic hypothesis of darkmatter but makes the assumption that our existing Laws of Gravitation need to be amended. Our proposed amendment falls well within the accepted domain of legitimate gravitational field equations.



Assumed Model of Spiral Galaxies: The bulk of the gravitating material of a spiral galaxy is here assumed to be contained in the galactic bulge. The material contained in the disk is insignificant in comparison to the material in the bulge so that such that the stars, star clusters, molecular clouds etc, can be considered to be test bodies moving under the influence of the gravitational field setup by the gravitating material in the galactic bulge.



Assumed Model of the Rotation Curve of Spiral Galaxies: In the bulge, the speed (VB) is proportional to the radial distance ($VB \propto r$) and the density (ρ_B) inside the bulge is assumed to be constant throughout. Inside the disk, the speed (V_{disk}) is constant throughout the galactic disk.

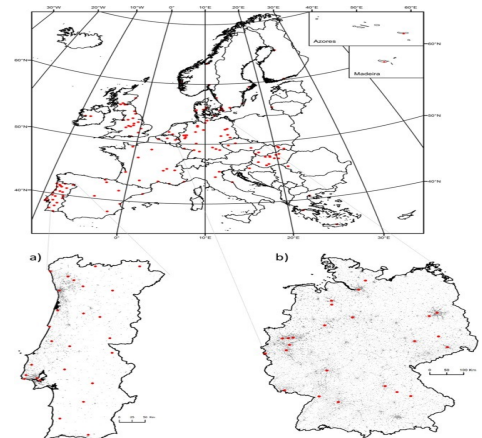
<https://www.sciencedirect.com/science/article/pii/>

Adaptation to climate change at local level in Europe: An overview

Francisca C.Aguiar, Julia Bentz, João M.N. Silva, Ana L. Fonseca, Rob Swart, Filipe Duarte Santos, Gil Penha-Lopes

Abstract

Europe's climate change vulnerability pushes for initiatives such as the European Adaptation Strategy and the associated Covenant of Mayors for Climate and Energy. What are the triggers and barriers, for which sectors and for which risks and how is adaptation funded? This paper examines 147 Local Adaptation Strategies in Europe. Key triggers were incentives via research projects, implementation of EU policies and the increasing frequency of extreme climate events. Insufficient resources, capacity, political commitment and uncertainty were the main barriers. Prioritized sectors reflected the main local vulnerabilities - flood protection and water management, built environment and urban planning. Differing patterns of adaptation planning and adaptive capacity were identified among different regions in Europe. Large municipalities generally fund adaptation locally, whereas international and national funding appears to be more important for adaptation in less urban or densely populated territories. The database of LAS described in the present study can be expanded and used to increase the understanding of and promotion of local adaptation action in Europe and beyond.



Location of the 147 case studies in Europe (municipalities, metropolitan areas and districts with local strategies on climate change adaptation). Country borders are shown. Maps of Portugal (a) and Germany (b) were detailed on Urban Land Cover, displayed in grey, from the Corine Land Cover map for Europe (seamless vector database for the reference year 2012, version 18_5).

<https://www.sciencedirect.com/science/article/pii/S146290111731153X>

The morphological study of spiral/lenticular galaxies in some pairs

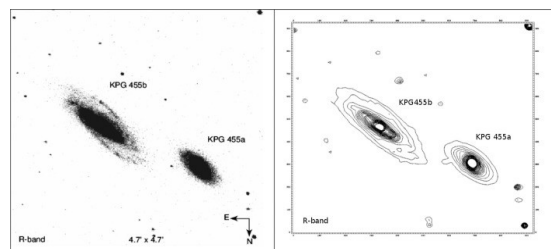
Y.H.M.HendyGamal B.Ali

Abstract

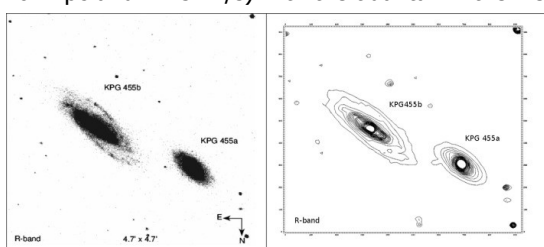
This work presents the optical observations for three galaxy pairs. We have presented the isophotal contours and geometrical analysis (x-center shift (xc), y-center shift (yc), ellipticity (Ellip = 1 - b/a) and position angle (P.A.)) for each component of the pair. The projected linear separations r_p and the relative velocity Δv of each pair have been determined.

This sample of galaxy pairs has been reported by Karachentsev Catalog without interaction signs. Our analysis shows that the galaxies had signs of interaction (tidal tail and tidal bridge or only tidal tail). The length and thickness of the tidal tails and tidal bridges have obtained and presented in this study.

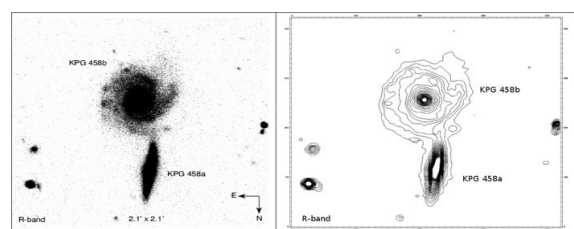
Our results show that two of the galaxy pairs are close pairs, i.e. contact systems ($r_p < 30h70-1kpc$ and $\Delta v < 200km/s$) with the tidal interaction of tails and bridges. While the other pair is an intermediate pair ($30 < r_p < 55h70-1kpc$ and $\Delta v < 5km/s$) with the tidal tail in the western side.



The R images (Left) and the contour maps (Right) of the system KPG 422.



The same as Fig. 1 but for KPG 455.



The same as Fig. 1 but for KPG 458.

<https://www.sciencedirect.com/science/article/pii/S2090997718301019>

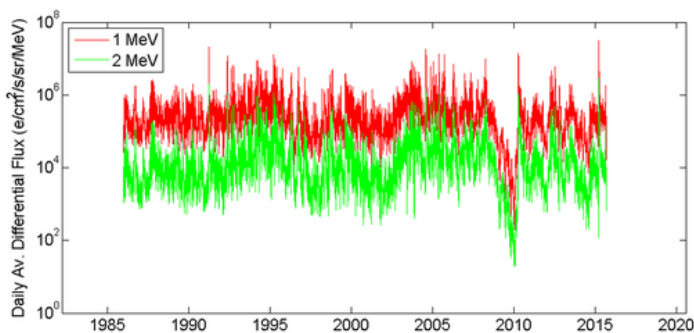
Radiation Effects on Satellites During Extreme Space Weather Events

A. D. P. Hands, K. A. Ryden, N. P. Meredith, S. A. Glauert, R. B. Horne

Abstract

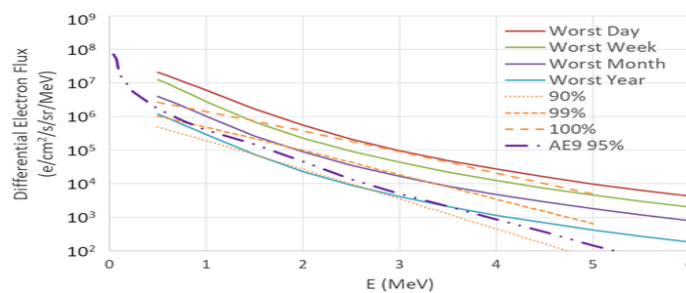
High-energy trapped electrons in the Van Allen belts pose a threat to the survivability of orbiting spacecraft. Two key radiation effects are total ionizing dose and displacement damage dose in components and materials, both of which cause cumulative and largely irreversible damage. During an extreme space weather event, trapped electron fluxes in the Van Allen belts can increase by several orders of magnitude in intensity, leading to an enhanced risk of satellite failure. We use extreme environments generated by modeling and statistical analyses to estimate

the consequences for satellites in terms of the radiation effects described above. A worst-case event could lead to significant losses in power generating capability—up to almost 8%—and cause up to four years' worth of ionizing dose degradation, leading to component damage and a life-shortening effect on satellites. The consequences of such losses are hugely significant given our increasing reliance on satellites for a vast array of services, including communication, navigation, defense, and critical infrastructure.



Reconstructed 30-year differential electron flux from the British Antarctic Survey radiation belt model. The daily average fluxes at 1 and 2 MeV are shown, with the 2009/2010 electron desert clearly visible.

<https://doi.org/10.1029/2018SW001913>



Worst-case spectra from British Antarctic Survey reconstructed 30-year data set, along a Galileo-like medium Earth orbit (solid lines). The worst-week spectrum is used for cumulative effects of total ionizing dose and displacement damage dose. Orbit-averaged Model of Outer Belt Electrons for Dielectric Internal Charging fluxes are also shown at three exceedance probabilities (dotted/dashed lines), as is the 95% confidence level spectrum from the AE9 static model.

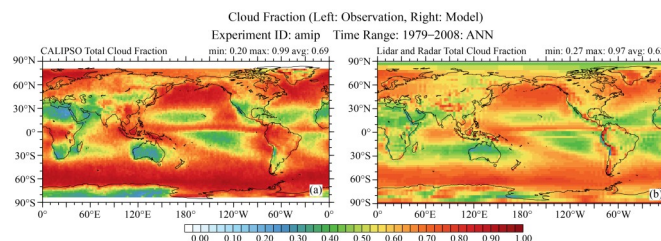
The FGOALS climate system model as a modeling tool for supporting climate sciences: An overview

TianJun Zhou, Bin Wang, YongQiang Yu, YiMin Liu, WeiPeng Zheng, LiJuan Li, Bo Wu, PengFei Lin, Zhun Guo, WenMin Man, Qing Bao, AnMin Duan, HaiLong Liu, XiaoLong Chen, Bian He, JianDong Li, LiWei Zou, XiaoCong Wang, LiXia Zhang,

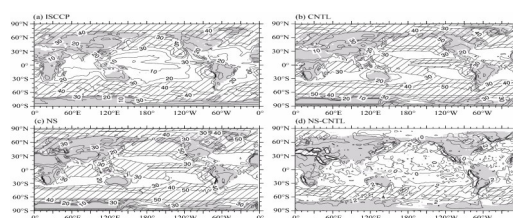
Abstract

Climate system models are useful tools for understanding the interactions among the components of the climate system and predicting/projecting future climate change. The development of climate models has been a central focus of the State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Institute of Atmospheric Physics, Chinese Academy of Sciences (LASG/IAP) since the establishment of the laboratory in 1985. In China, many pioneering component models and fully coupled models of the climate system have been developed by LASG/IAP. The fully coupled climate system developed in the recent decade is named FGOALS (Flexible Global Ocean–Atmosphere–Land System Model). In this paper, an application-oriented review of the LASG/IAP FGOALS model is presented. The improved model performances are demonstrated in the context of cloud–radiation processes, Asian monsoon, ENSO phenomena, Atlantic Meridional Overturning Circulation (AMOC) and sea ice. The FGOALS model has contributed to both CMIP5 (Coupled Model Intercomparison Project–phase 5) and IPCC (Intergovernmental Panel on Climate Change) AR5 (the Fifth Assessment Report). The release of FGOALS data has supported the publication of nearly 500 papers around the world. The results of FGOALS are cited ~106 times in the IPCC WG1 (Working Group 1) AR5. In addition to the traditional long-term simulations and projections, near-term decadal climate prediction is a new set of CMIP experiment, progress of LASG/IAP in the development of near-term decadal prediction system is reviewed. The FGOALS model has supported many Chinese national-level research projects and contributed to the national climate change assessment report. The crucial role of FGOALS as a modeling

tool for supporting climate sciences is highlighted by demonstrating the model's performances in the simulation of the evolution of Earth's climate from the past to the future.



Geographical distribution of total cloud fraction for (a) CALIPSO observations and (b) GAMIL2 using the CALIPSO satellite simulator (from Li LJ et al., 2014a).



Annual mean low-level stratiform cloud fraction (%). (a) ISCCP; (b) GAMIL2 with original stratocumulus scheme; (c) GAMIL2 with a modified stratocumulus scheme; (d) Differences in cloud amount between (b) and (c).

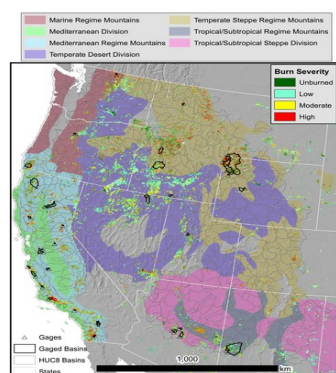
<https://doi.org/10.26464/epp2018026>

Nonlinear Long-Term Large Watershed Hydrologic Response to Wildfire and Climatic Dynamics Locally Increases Water Yields

Michael L. Wine, Oleg Makhnin, Daniel Cadol

Abstract

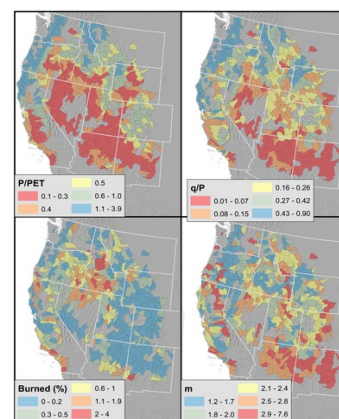
On all inhabited continents, wildfires are important ecological disturbances that influence water resources. As an exemplar of this global phenomenon, wildfire activity in the western United States increased in the 1980s and has continued to trend upward in subsequent decades.



Map of seven Bailey ecoregion divisions comprising the study region. Across this domain wildfire frequency and severity—tracked by the Monitoring Trends in Burn Severity (Eidenshink et al., 2007)

<https://doi.org/10.1029/2018EF000930>

However, the hydrologic impact of wildfire has been difficult to ascertain at a continental scale due to the complexity of processes that influence critical zone dynamics. We calibrated Fuh's equation to wildfire-impacted gauged watersheds and used the validated model to retrospectively quantify the proportion of streamflow attributed to wildfire hydrologic impacts from 1986 to 2015 across ungauged watersheds, accounting for interwatershed variability in water retention capacity and climate as well as how these factors interact with burned area and postwildfire vegetation recovery. Here we show that in parts of the western United States with high proportion of area burned by fire, wildfire-linked streamflow accounts for as much as 20% of streamflow, rivaling or exceeding predicted climate change impacts. This analytic framework demonstrates that over a multidecadal period, the present trajectory of rising temperatures and increases in large wildfires may enhance the regional-scale importance of wildfires in streamflow generation, thereby partially offsetting projected streamflow reductions due to rising temperatures and evaporative demand.



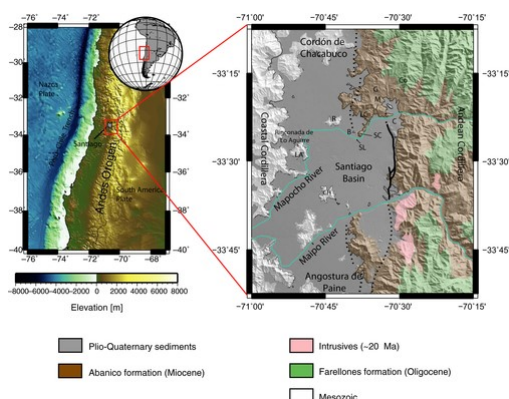
Fuh's equation predicts the nonlinear relationship between wetness index—the quotient of precipitation (P) and potential evapotranspiration (PET)—and runoff coefficient—streamflow (q) as a proportion of precipitation—for 39 gauged USGS watersheds at an annual time step over three decades across the western United States. m indicates watershed-scale water retention capacity (Zhou et al., 2015).

Characterization of the depocenters and the basement structure, below the central Chile Andean Forearc: A 3D geophysical modelling in Santiago Basin area

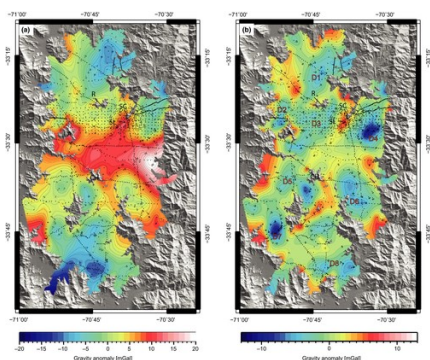
Felipe Andrés González, Andrei Maksymowicz, Daniel Díaz, Luis Villegas, Maximiliano Leiva, Emilio Vera, Sergio Contreras, Daniel Cabrera, Sylvain Bonvalot

Abstract

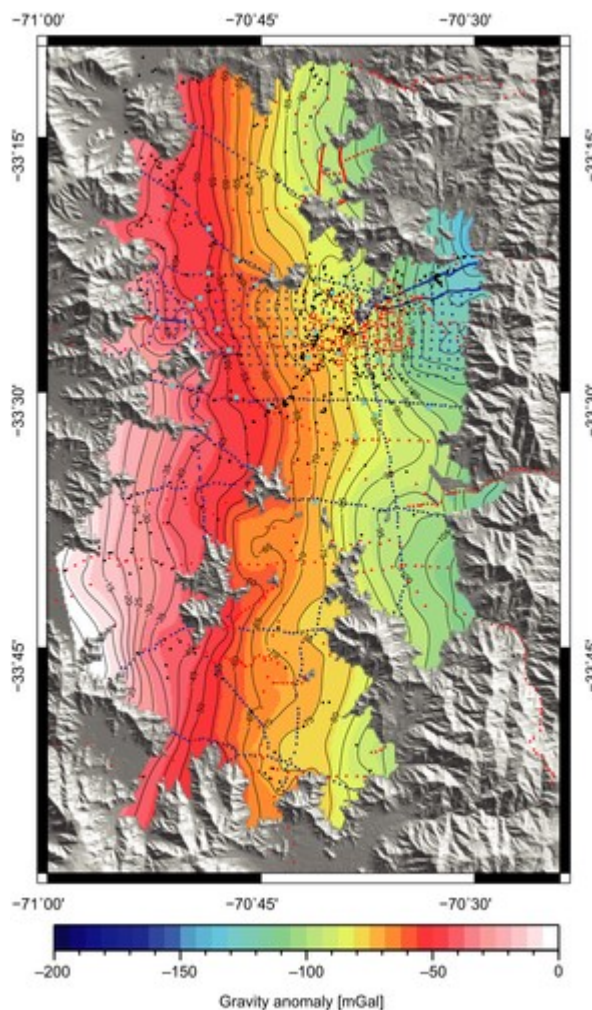
Since the last century, several geological and geophysical studies have been developed in the Santiago Basin to understand its morphology and tectonic evolution. However, some uncertainties regarding sedimentary fill properties and possible density anomalies below the sediments/basement boundary remain. Considering that this is an area densely populated with more than 6 million inhabitants in a highly active seismotectonic environment, the physical properties of the Santiago Basin are important to study the geological and structural evolution of the Andean forearc and to characterize its seismic response and related seismic hazard. Two and three-dimensional gravimetric models were developed, based on a database of 797 compiled and 883 newly acquired gravity stations. To produce a well-constrained basement elevation model, a review of 499 wells and 30 transient electromagnetic soundings were used, which contribute with basement depth or minimum sedimentary thickness information. For the 2-D modelling, a total of 49 gravimetric profiles were processed considering a homogeneous density contrast and independent regional trends. A strong positive gravity anomaly was observed in the centre of the basin, which complicated the modelling process but was carefully addressed with the available constrains. The resulting basement elevation models show complex basement geometry with, at least, eight recognizable depocenters with maximum sedimentary infill of ~ 500 m. The 3-D density models show alignments in the basement that correlates well with important intrusive units of the Cenozoic and Mesozoic. Along with interpreted fault zones westwards and eastwards of the basin, the observations suggest a structural control of Santiago basin geometry, where recent deformation associated with the Andean contractional deformation front and old structures developed during the Cenozoic extension are superimposed to the variability of river erosion/deposition processes.



Location and geology of the studied area. The left panel shows the regional elevation map around the studied area. The studied area is highlighted in red. The right panel shows a simplified geological map of the studied area and the location of the Andean deformation front. The black line indicates the trace of San Ramon fault observed in the surface, and the dotted line corresponds to the inferred trace of Andean deformation front to the north and to the south. B: Blanco hill, C: Calán hill, CH: Chena hill, Co: Conchalí hill, G: Gordo hill, LA: Lo Aguirre hill, LC: Las Canteras hill, M: Manquehue hill, R: Renca hill, SC: San Cristóbal hill, SL: Santa Lucía hill



Residual gravity anomaly in the Santiago basin. (a) The result from the regional trend extraction of the CBA (Figure 2), while (b) shows the RBA spatially filtered based on the application of a high-pass filter with a cut-off wavelength of 20 km. The location of eight identified depocenters is shown in (b) (D1-D8) and the gravity stations are plotted as black filled circles. CH: Chena hill, LA: Lo Aguirre hill, R: Renca hill, SC: San Cristóbal hill, SL: Santa Lucía hill



Complete Bouguer anomaly in the Santiago basin. The gravity stations location from the PRS project and other compiled campaigns are plotted as blue filled circles and red filled circles respectively. The TEM stations and integrated wells and boreholes are plotted as cyan filled boxes and black filled circles respectively

<https://doi.org/10.1111/bre.12281>

NOTICIAS

Estrellas vs. polvo en la nebulosa Carina

Situada a unos 7.500 años luz de distancia, en la constelación de Carina, se encuentra una nebulosa en la que las estrellas nacen y mueren revueltas. Estos impresionantes eventos han dado forma a la dinámica nebulosa Carina, una nube en constante evolución formada por gas interestelar y polvo apenas dispersos.

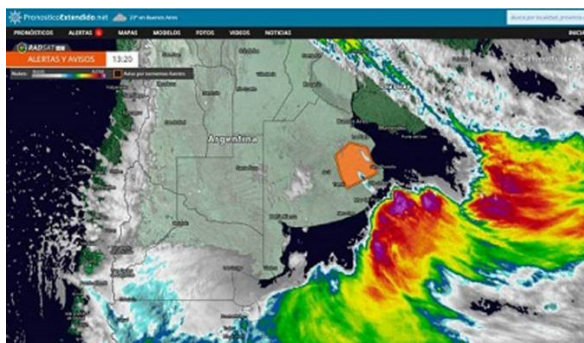
Las estrellas masivas que hay en el interior de esta burbuja cósmica emiten una intensa radiación que hace que el gas circundante brille. Por el contrario, otras regiones de la nebulosa contienen pilares oscuros de polvo que ocultan a las estrellas recién nacidas. En la nebulosa Carina hay una batalla salvaje entre estrellas y polvo, y las estrellas nacientes están ganando, ya que producen radiación de alta energía y vientos estelares que evaporan y dispersan los polvorientos viveros estelares en los cuales se han formado.

En la imagen, vemos que Eta Carinae forma parte del brillante parche de luz que hay justo encima del punto que hay sobre la "V" que forman las nubes de polvo. Justo a la derecha de Eta Carinae está la nebulosa Keyhole (nebulosa del ojo de la cerradura), una pequeña nube densa de moléculas frías y gas dentro de la nebulosa Carina que alberga varias estrellas masivas, y cuya apariencia también ha cambiado drásticamente durante los últimos siglos.



<https://noticiadelaciencia.com/art/29728/estrellas-vs-polvo-en-la-nebulosa-carina>

Nueva técnica para analizar datos y reducir errores en modelos meteorológicos



Actualmente se obtienen en una hora cientos de terabytes de datos provenientes de satélites remotos, radares meteorológicos, y otros numerosos instrumentos que miden el estado de la atmósfera. Con este caudal de información, los científicos se enfrentan al desafío de desarrollar técnicas para el análisis de "big data" destinadas, en este caso, a mejorar los pronósticos meteorológicos, pero fundamentalmente enfocadas en la prevención de desastres naturales. La utilización de toda esta información observacional en los pronósticos meteorológicos es lo que se denomina asimilación de datos.

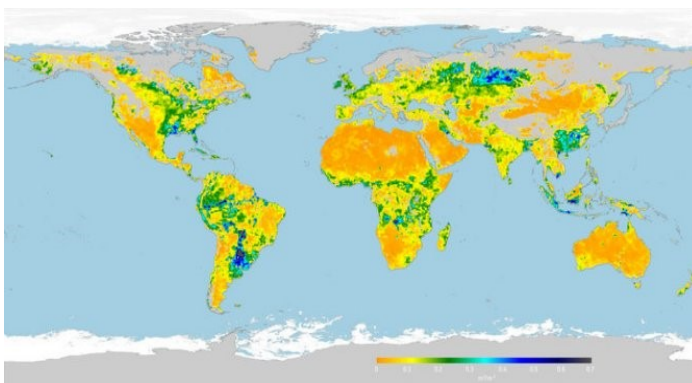
El doctor Manuel Pulido, docente del Departamento de Física de la Facultad de Ciencias Exactas y Naturales y Agrimensura de la UNNE, e investigador en el Instituto de Modelado en Innovación Tecnológica del Conicet (Argentina), desarrolló, junto a su grupo de trabajo, una técnica basada en el aprendizaje automatizado "para inferir el error de modelo, en modelos de pronósticos meteorológicos". Dicho de otra forma, la técnica permite seleccionar datos de toda la información circundante, de forma tal que se reduzca el error en los modelos de pronósticos meteorológicos.

<https://noticiadelaciencia.com/art/29653/nueva-tecnica-para-analizar-datos-y-reducir-errores-en-modelos-meteorologicos>

Logran la restauración hidrológica de humedales impactados por actividades productivas

El agua es crucial para la vida en la Tierra. En la actualidad, no obstante, la sobreexplotación y la contaminación suponen un problema para el medio ambiente, las economías y las condiciones de vida en el planeta. Estos retos se abordan en los Objetivos de Desarrollo Sostenible (ODS) de las Naciones Unidas y en la Semana Mundial del Agua, que está teniendo lugar entre el 26 y el 31 de agosto en Estocolmo (Suecia).

La Semana Mundial del Agua ofrece una oportunidad perfecta para que miles de participantes del mundo académico, la industria y la administración intercambien ideas sobre el tema de este año: "agua, ecosistemas y desarrollo humano". Organizada por el Instituto Internacional del Agua de Estocolmo (SIWI), este foro promueve la colaboración para resolver las crisis hídricas que se avecinan. El acontecimiento, además, tiene lugar en un momento en que Europa se está recuperando de un verano excepcionalmente seco y cálido, lo que ha provocado una fuerte sequía en países nórdicos como Suecia y Dinamarca.



<https://noticiadelaciencia.com/art/29721/semana-mundial-del-agua-el-papel-de-la-esa-frente-a-la-escasez>

XI Simposio Internacional sobre la Flora Silvestre en Zonas Áridas/ Semiáridas

http://web.uas.edu.mx/web/index.php?seccion=noticias&op=2&id_eventos=3878






XI SIMPOSIO INTERNACIONAL SOBRE LA FLORA SILVESTRE EN ZONAS ÁRIDAS/SEMIÁRIDAS

SIFSZA
24, 25 y 26 de octubre del 2018

TORRE ACADÉMICA DE LA UNIVERSIDAD AUTÓNOMA DE SINALOA

Boulevard Las Américas s/n. Ciudad Universitaria Culiacán, Sinaloa, México.

Participa a través de presentación oral o exposición de cartel científico

OBJETIVOS	TEMARIO	INSCRIPCIÓN
<ul style="list-style-type: none"> Presentar los avances en las investigaciones sobre la flora silvestre en zonas áridas y semiáridas. Propiciar la comunicación entre profesores, investigadores, productores, comerciantes, profesionales, estudiantes y demás personas interesadas, que conduzca a conocer la problemática de la flora silvestre en zonas áridas/semiáridas y sus posibles soluciones. Promover e incrementar la vinculación de la investigación con el sector productivo. 	<ul style="list-style-type: none"> Manejo y aprovechamiento Ecología y conservación Restauración ecológica Taxonomía y florística Etnobotánica Paisajismo Servicios ambientales Agronomía Biocombustibles Biotecnología vegetal Química y bioquímica Valor agregado 	<p>Antes del 31 de agosto (ambos días el 1 de septiembre)</p> <p>\$537 Estudiantes de licenciatura</p> <p>\$1,068 Estudiantes de posgrado</p> <p>\$2,661 Profesionales</p> <p>Encuentra toda la información en: sifsza.uas.edu.mx</p> <p>(52) (667) 7605536</p> <p>sifsza@uas.edu.mx</p> 



Congreso Internacional de Recursos Naturales Tabasco 2018



COIRENAT
Consejo Internacional de Recursos Naturales y Vida Silvestre A.C.

<http://www.conacytprensa.mx/index.php/sociedad/eventos/evento/2647-congreso-internacional-de-recursos-naturales-tabasco-2018>



DIRECTORIO

UNIVERSIDAD AUTÓNOMA DE SINALOA

DR. JUAN EULOGIO GUERRA LIERA

RECTOR

DR. JESÚS MADUEÑA MOLINA

SECRETARIO GENERAL



DR. WENSESLAO PLATA ROCHA

DIRECTOR DE LA FACULTAD DE CIENCIAS DE LA TIERRA
Y EL ESPACIO

MC. ANÍBAL ISRAEL ARANA MEDINA

SECRETARIO ACADÉMICO

DR. PEDRO ROMERO SUÁREZ

ASESOR DEL OBSERVATORIO

M.C.I. LIDIA YADIRA PEREZ AGUILAR

DISEÑADORA/EDITORA



<http://geodesia.uas.edu.mx/>