SCHOLARS CONFERENCES

World Congress on

EARTH SCIENCE AND CLIMATE CHANGE

08-09 April 2024 | Paris, France

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SCIENTIFIC PROGRAM

Day 1 | April 08, 2024 | Hall 1

08:30-09:15 Registrations

09:15-09:30 Opening Ceremony

Keynote Forum

09:30-10:00
Title: Investigation of the Three Dimensional Structure across the Red Sea Rift: The Key Role of the Red Sea Rift Process in the Activity in Saudi Arabia and Egypt
Mohamed Abdelwahed, King Abdulaziz University, KSA

10:00-10:30
Title: Contrasting Hydrological Regimes in Two Adjoining Semi-Arid Areas, with Low Rain Intensities
Aaron Yair, Hebrew University, Israel

10:30-11:00
Title: Innovations in Regenerative Agriculture: Pioneering Solutions for Climate Change Mitigation
David M Kargbo, Temple University, USA

Networking and Refreshments Break @11:00-11:20

11:20-11:50
Title: Usage of Oak-tree (Quercus ilex) as Biogeochemical Indicator of Environmental Contamination
Pablo Higueras, IGeA-UCLM, Spain

11:50-12:20
Title: Assessing Ecosystem Functionality of a Degraded Land in a Climate Change Scenario
Juan Antonio Campos, UCLM, Spain

12:20-12:50
Title: 3D Printing Optimization: How to Apply Multidisciplinary Approach through Optimization of the Process?
Hamid Reza Vanaei, Léonard de Vinci (DVRC) - Arts et Métiers (ENSAM), France

Group Photo

Lunch Break: 12:50-13:40

Speaker Session:
Session Chair: David M Kargbo, Temple University, USA

13:40-14:00
Title: Thermoset Materials, a New Material Class For SLS 3d-Printing Advantages and Use Cases
Thomas Wagner, TIGER Coatings GmbH & Co.KG, Austria

14:00-14:20
Title: Metal 3D Printing in Impeller Manufacturing
Mohamad Tarek Ibrahim Amin Farag, Sierra Engineering & Manufacturing, Egypt

14:20-14:40
Title: Defect-correlated Very High Cycle Fatigue Performances of Additively Manufactured Titanium and Nickel Alloys
Qingyuan Wang, Chengdu University, China

14:40-15:10
Title: ConsiderationsRegarding a Climate Change, Food Security, Trusability Nexus for Assuring the Food Security in the Agriculture Field
Bratucu David-Iustin, Andrei Saguna National College, Romania
Bianca Tescasiu, Andrei Saguna National College, Romania

15:10-15:25
Title: Study on the Effect of Personal Behavioral Characteristics on the Air Pollution Levels in Brasov, Romania
Calin Dancu, Andrei Saguna National College, Romania

15:25-15:55	**Title: A Revolutionary Filter for Bovine Emissions** **Aldea Dragos Andrei,** Andrei Saguna National College, Romania **Sindie Mihai,** Andrei Saguna National College, Romania
	Networking and Refreshments Break @15:55-16:15
16:15-16:35	**Title: Applications of MRFs in the Removal of Apace Debris** **Stancescu Victor-Gabriel,** Andrei Saguna National College, Romania **Ana Stancioiu,** Andrei Saguna National College, Romania
16:35-17:05	**Title: Implementation of Space Waste Management Procedures on Earth** **Ema Neagoe,** Andrei Saguna National College, Romania **Padurariu Tudor Andrei,** Andrei Saguna National College, Romania
	Poster Presentations @ 17:05-17:30
P0101	**Title: Investigation of Density-Stiffness Scaling Laws in Glass Sponge Structures Fabricated by 3D Printing Method** **Hassan Beigi Rizi,** CNRS, France
	Panel Discussions & B2B Meetings
	Day 01 End | Closing Ceremony

Day 2 | April 09, 2024 | Virtual | GMT +1

09:05-09:15 : Introduction

Keynote Forum

09:30-10:00	**Title: The Amazon Near a Tipping Point. The Urgent Need of Nature-Based Solutions** **Carlos A Nobre,** University of Sao Paulo, Brazil
10:00-10:30	**Title: Selected properties of degraded anthropogenic soil fertilized with a mixture of coal mining waste and sewage sludge** **Grazyna Zukowska,** University of Life Sciences in Lublin, Poland
10:30-11:10	**Title: Institutional Biomass Gasification Cookstoves Provide Undervalued Global Health, Climate, and Carbon-Offset Opportunities for Globally Underserved Communities** **Kevin Adair,** Fuego del Sol, USA
11:10-11:40	**Title: Focusing on: Rural Socioeconomic Revitalization Stimulation via a Renewable Bio-based Castor Economy** **Jesse Ilan Wainer,** Rainforest Reliance Inc., USA **Sayda Chantal,** Rainforest Reliance Inc., USA
	Refreshments Break @ 11:40-11:50

Speaker Session

11:50-12:10	**Title:The impact of reclamation on the enzymatic activity of soil degraded by open-pit mining** **Magdalena** Myszura-Dymek, University of Life Sciences in Lublin, Poland
12:10-12:30	**Title: Investigation of Pharmacy Drug Sales to Determine the Effects of Heat Waves on Chronic Diseases in Istanbul** **Yunus OZTURK,** Turkish Education Ministry, Turkey
12:30-12:50	**Title: Addressing the Challenges of Climate Forecasting Amidst Climate Change: Insights from Mexico and LATAM** **Octavio Farias,** NWS_Mexico/UNAM/IPN, Mexico
12:50-13:10	**Title: Simulation of Ground Water Lake Interaction along Kahal Lake, Haripur area, Khyber Pakhtunkhwa Pakistan** **Adnan Sami,** University of Haripur, Pakistan
	Refreshments Break @ 13:10-13:30
13:30-13:50	**Title: SPACEWHALE: Using satellite imagery to survey whales in remote areas and thus to enhance conservation efforts** **Julika Voss,** BioConsult SH, Germany
	E-Poster Session

P0102- 13:50-14:00	**Title: Geoscientific Agility: The use of SCRUM Methodology for Elaborating Geosciences Software Solution** **Douglas de Castro,** Universidade Estadual de Campinas, Brazil
P0103- 14:00-14:10	**Title: Application of 3D Modeling to Highlight Karstic Cavities in the Thies Forest in Support of Planning Soil Consolidation Work by Grout Injection on Cement Works: Perspectives on The Influence of Climatic Factors** **Mouhamed Gueye,** Miniere Osisko, Canada
P0104- 14:10-14:20	**Title: Study of the Improvement of Soils Treated with Ecological Stabilizers: The Example of Earthbind and Top Seal White** **Chaimae Karbal,** USA
P0105- 14:20-14:30	**Title: "Knowledge gaps in adaptation planning in the Paraná Delta": Collaboration National University of Rosario - Nairobi Work Program of the United Nations Framework** **Nadia Itzel Castillo Perez,** Universidad Veracruzana, Mexico
Panel Discussions & B2B Meetings	
Day 02 End | Closing Ceremony	

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KEYNOTE SPEAKERS Day 1

Mohamed Abdelwahed
King Abdulaziz University, KSA

Biography

Abdelwahed is a full professor in Seismology. Originally, he has working in the National Research Institute of Astronomy and Geophysics, NRIAG, Egypt. He got his B.Sc. from Cairo University 1992, his Ph.D. from Japan 2006. Now, he is working in the Geohazards Research Center, King Abdulaziz University, Saudi Arabia. Abdelwahed has a long experience in seismic tomography methods and seismological software development. He has a lot of contributions in the scientific community. As a software developer, he is the founder of the SGRAPH program for seismological data analysis; and Tomotools3D as a seismic tomography toolkit. As a researcher, he has publications in seismic tomography, attenuation, waveform modeling, data compression, and others.

Investigation of the three dimensional structure across the Red Sea rift: the key role of the Red sea rift process in the activity in Saudi Arabia and Egypt

We present new P-, S-wave, and Poisson's ratio tomographic images of the subsurface structure in the Red Sea rift zone between Saudi Arabia and Egypt. A large number of travel time data from the Saudi and Egyptian seismological networks is used. The area of study comprises the Lunayyir volcanic field (LVF, 1.0Ma) in Saudi Arabia, the Abu-Dabbab seismogenic zone in the Egyptian Red Sea coast, and the Zabargad Shear Zone (ZSZ) in the Red Sea rift. Recent activity is the LVF with the M5.7 magnitude raised the arguments about the tectonic/volcanic nature of this activity that is not observed in the Egyptian side. The result of this study revealed new information about the role of the Red Sea rift process on the seismo-volcanicity in the area. The Red Sea rifting related structure in the Red Sea is well imaged as the down faulted blocks in the rift zone. The LVF activity is possibly controlled by the Yanbu Suture Zone (YSZ) that embraces the field and traverses to the Red Sea. The Yanbu submerged plate (YSP) is well imaged in this study and may act as pathways for magma intrusion. In the Red Sea offshore, a magma channel -like structure possibly exists at shallow depth beneath Red Sea and Saudi Arabia. In contrast, the Egyptian Red Sea coast appeared as a complex structure that may reflect the accretion process of the early Gondwana collision. Abu-Dabbab-Marsa Alam areas are entrapped in a complex V-shaped high velocity anomaly structure with evidence of magmatic intrusion. This V-shaped anomaly which are possibly dipping toward the Sea implying a sort of relationship with the early Red Sea rift process.

Aaron Yair
Hebrew University, Israel

Biography

Aaron Yair has completed undergraduate studies (Geography) at the University of Paris (Sorbonne). Graduate and PhD studies (Geomorphology) at the Hebrew University of Jerusalem (Summa cum laude). He is mainly interested in the study of geomorphic processes in arid and semi-arid environments. His studies cover the three prevailing landscapes in dry-land areas: rocky areas; sandy areas and loess covered areas. In 1972, he established the long-term Sede Boqer Research Station, characteristic of an arid rocky area. In 1999, he established (in the frame of the Minerva Organization, the Arid Ecosystems Research Centre, in the Nizzana area. This site represents a sandy ecosystem. The studies were conducted along a rainfall gradient from 90-450 average annual rainfall, focusing on the hydrology and ecology of the various sandy areas. Finally, the studies of the loess covered areas, focused on the hydrological and pedological aspects, in an area with 280 mm average annual rainfall. He received the following awards:

2002: MEMBRE D' HONNEUR, SOCIETE DE GEOGRAPHIE, FRANCE

2003 FAROUK EL BAZ AWARD: QUATERNARY GEOLOGY AND GEOMOPHOLOGY DIVISION; GEOLOGICAL SOCIETY OF AMERICA

2012: CATENA: CERTIFICATE OF EXCERLLERNCE IN REVIEWING

2022. OXFORD INTENATIONAL RESEARCH AWARD FOR OUTSTANDING RESEARCH IN EARTH SCIENCES

Contrasting hydrological regimes in two adjoining semi-arid areas, with low rain intensities

The present study deals with the hydrology of two adjoining watersheds, located in an area where average annual rainfall is 280 mm. One watershed is located in a loess covered area, and the second in a rocky area. Hydrological data collected in the loess covered area point to a very high frequency of channel flow. However, even in extreme rain events peak discharges are extremely low, pointing to a limited contributing area. The explanation proposed is that runoff generation is limited to the channel area, where a quasi-permanent seal, very rich in dispersive clays responds quickly to low rain intensities. The contribution of the adjoining hillslopes is negligible. The hydrological regime in the rocky area is opposite. The frequency of overland flow is high. However, channel flow did not occur even in an extreme rain event of 105 mm, with a peak rain intensity of 90 mm/h2. The hydrological dis-connectivity at the hillslope-channel interface is explained by the local rainfall characteristics. Rain storms are highly intermittent, and the concentration time required for a continuous flow, along a whole slope, is much longer than the duration of most intermittent rain showers. Data obtained limit the possibility of extrapolation hydrological data from one area to another, under the same rainfall regime.

David M Kargbo
Temple University, USA

Biography

David M. Kargbo is a distinguished environmental scientist, researcher, educator, and author. He was a senior scientist with the US Environmental Protection Agency for 21 years and was awarded a Gold Medal for his exemplary career. He is currently an Adjunct Associate Professor of Environmental Engineering at Temple University, USA, and CEO of EnviroOne, a non-profit sustainable environmental and agriculture company. Dr. Kargbo has published numerous peer-reviewed articles and serves on the editorial boards of internationally acclaimed peer-reviewed journals. His recent book on climate change is a game-changer for climate action.

Innovations in Regenerative Agriculture: Pioneering Solutions for Climate Change Mitigation

This paper presents an in-depth analysis of cutting-edge innovations in Regenerative Agriculture and their potential impact on climate change mitigation. Regenerative Agriculture, a practice centered around restoring soil health and ecosystem balance, has emerged as a promising approach to sequester carbon and reduce greenhouse gases in the atmosphere. The focus of this research is on novel techniques and technologies that are revolutionizing this field.

The paper begins by exploring advancements in soil health monitoring, including sensor technology and AI-driven data analytics, which enable farmers to make informed decisions about soil management. It then examines the development of new bio-based fertilizers and soil amendments that enhance soil fertility while reducing dependency on synthetic inputs, thereby lowering the carbon footprint of agricultural practices.

Another critical area of innovation discussed is agroforestry and permaculture design, which integrate tree planting and diverse perennials into farming systems. This approach not only sequesters significant amounts of carbon but also boosts biodiversity and ecosystem resilience. The paper also highlights the role of precision agriculture in Regenerative Agriculture, showcasing how drone technology and remote sensing can optimize resource use and minimize environmental impact.

Furthermore, the paper addresses the socio-economic dimensions of these innovations, including their scalability, accessibility for small-scale farmers, and potential to create sustainable livelihoods. Policy recommendations are provided to support the adoption and scaling of these innovative practices.

By showcasing these pioneering developments in Regenerative Agriculture, the paper underscores the significant potential of this approach in addressing climate change. It argues that integrating traditional knowledge with modern technology can transform agricultural systems into sustainable, resilient, and productive landscapes, making a substantial contribution to global climate change mitigation efforts.

Pablo Higueras
IGeA-UCLM, Spain

Biography

Pablo Higueras has complete PhD in Earth Sciences awarded by the University of Granada (Spain) in 2000. Currently serving as a Professor of Mining Geology and Exploration at the Almadén School of Mines, University of Castilla La Mancha (Spain), a position He has held since 1990. Throughout my tenure, he has led and collaborated on numerous research projects focused on Soil Geochemistry, Biogeochemistry, Metal Contamination, and the Restoration of Degraded Environments. he has authored and co-authored over 120 indexed articles and have been an active participant in various international congresses.

Usage of oak-tree (Quercus ilex) as biogeochemical indicator of environmental Contamination

The Holm Oak (Quercus ilex) is an evergreen tree of significant stature, capable of reaching heights of 21–28 meters (69–92 feet) in favorable environments, and developing a broad canopy of densely foliated branches in open settings. It is a widespread species across Europe, exhibiting various varieties adapted to diverse climatic conditions. In Spain, particularly in the region known as the "Sierra Morena" between Castilla-La Mancha and Andalusia, it is exceedingly abundant, forming both forests (in higher altitude areas) and 'dehesas', a man-made landscape characterized by scattered Holm Oaks amidst pasturelands utilized for livestock grazing, notably cattle and pigs. Additionally, it is recognized for its remarkable resilience to adverse soil conditions, including poor soil structure and elevated concentrations of potentially toxic elements, as observed in mining regions.

The use of this species to monitor environmental impacts has been documented, among others, by Higueras et al. (2017), Gratani et al. (2018), and Monaci et al. (2022). These studies highlight that, although the plant has a low bio accumulative capacity, the composition of its leaves reflects geochemical characteristics of the substrate, as well as indications of the presence of potentially toxic elements, sufficiently indicative of their presence in the soil.

In this communication, we present data demonstrating how the biogeochemistry of Q. ilex can serve as an effective tool for characterizing the lithological substrate of an area, while also aiding in the identification of anomalous concentrations of elements relevant to mining interests, as well as those potentially posing risks to the environment and food chains.

Juan Antonio Campos
UCLM, Spain

Biography

Juan Antonio has completed Ph.D. in Biological Sciences from the University of Granada (Spain) in 1995. Professor of Biology, Botany, and Plant Eco-physiology in the Agricultural and Agri-food Engineering degree program (ETSIA-University of Castilla La Mancha) since 1986 to date. He has participated in numerous research projects with a common focus on Soil Biology, Metal Contamination, and the Restoration of Degraded Spaces. He has actively contributed to over 20 indexed articles and participated in numerous international congresses.

Assessing ecosystem functionality of a degraded land in a climate change scenario

The degradation of land remains as a future challenge for humans, as it diminishes food security, contaminates water, drives biodiversity losses, and minimizes a wide array of ecosystem services including the regulation of water and climate. Furthermore, all these degradation processes can be exacerbated in a scenario of global warming. Currently, it is crucial to know and manage tools to understand and, ultimately, predict the response of ecosystems to disturbances. However, comprehending those dynamics is not straightforward. Ecosystems are a complex network of interactions among species, and therefore, any change in the population of a species will have a certain degree of effect at the community level.

The natural colonization of an abandoned sulfide metal minesite has been monitored for several years. In our work, we present a methodology for on-site exploration and analysis based on tracking the resources generated within the ecosystem (primarily organic matter and water) and quantifying the factors determining their ultimate fate. We assess the potential utility of conducting photographic transects that enable us to identify and prioritize the variables affecting ecosystem viability. These transects not only help identify the components comprising the ecosystem but also facilitate quantitative assessments of ecosystem progress or deterioration.

We have observed some interesting interspecific strategies that lead to the improvement of soil conditions, increasing the organic matter content, favoring compaction, water retention, and some enzymatic activities linked to microbial activity. This study makes predictions about the hypothetical capacity of plants to generate resources and how different substates alter plant strategies to achieve sustainable vegetation cover, despite strong environmental limitations. The general objective of this study is to gather knowledge to understand the relationship between soil properties and species dynamic in hostile environments.

Hamid Reza Vanaei
Léonard de Vinci (DVRC) - Arts et Métiers (ENSAM), France

Biography

Hamid Reza Vanaei is an Associate Professor. He got his MSc and PhD in Mechanics of Materials in Arts et Métiers, Paris-France. He has 6 years of experience in Material Science, Mechanical Engineering, and Additive Manufacturing. He worked as postdoc to apply Artificial Intelligence and Machine Learning toward the optimization in Turbo machinery as well as their production procedure using AM techniques. During his journey, he developed an in situ monitoring approach for temperature recording. The main research work that he realizes essentially consists a multidisciplinary approach toward AM techniques, particularly Fused Filament Fabrication (FFF). His main research topics include AM and AI and in parallel, their application to other related research categories and industrial projects.

3D Printing Optimization: How to apply Multidisciplinary Approach through Optimization of the Process?

The problems of effective bonding, reduced strength and mechanical performance of fused filament fabrication (FFF)-printed 3D models are still major concerns in 3D-printed structures. Fused filament fabrication – also known as 3D printing – is extensively used to produce prototypes for applications in, e. g., the aerospace, medical, and automotive industries. In this process, a thermoplastic polymer is fed into a liquefier that extrudes a filament while moving in successive X-Y planes along the Z direction, to fabricate a 3D part in a layer-by-layer process. Accordingly, several parameters affect the manufactured part quality, like the temperature profile of the polymer and thus the inter-layer bonding. It is therefore important to understand how the process parameters affect the evolution of filaments temperature as mentioned. Despite the advantages of FDM/FFF, it needs to be improved and optimized to reach the industry requirements. This optimization could be obtained by maximization of mechanical characteristics and bonding quality (objective: part quality), and by minimization of part cost and build time (objective: process optimization). Given the above-mentioned statements, the temperature evolution during FFF process thoroughly specified the quality and mechanical strength of fabricated structures. Experimental monitoring and analytical investigations are still challenging in FFF and lack of practical knowledge corresponds to the problem of bonding in this process. Since the rheological characteristics are a function of temperature, together with the mentioned process variables, are widely affected by temperature evolution of filaments while printing. To sum up, investigation on optimization of FFF process is still in its early stage and it is required to perform optimization tools as a function of the mentioned variables.

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SPEAKERS Day 1

Thomas Wagner
TIGER Coatings GmbH & CoKG, Austria

Biography

Wagner is original chemist and graduated with an engineer degree from HTL-Wels. Later on He graduated as Executive MBA from LIMAK Austrian business school Linz/Austria in cooperation with Emory University/Atlanta and Tsinghua University/Beijing. He was working since more then 23 years in plastic industry mainly in the field of automotive. His CV shows 16years within Polyolefins company Borealis (from 2000-2016) and 7 years as Business Unit director for 3D-printing with TIGER coatings (from 2016 up to now).

Thermoset materials, a new material class for SLS 3D-Printing Advantages and Use cases

Since years thermoplastic materials are dominating the 3D-printing market not only in SLS (Selective Laser Sintering) 3D-printing. As 3D-printing goes more industrial, there is the need to find innovative solution in material properties AND economical fields. Thermoplastic materials are coming to their borders in usage and/or are becoming economically not suitable for bigger production rates. To overcome this boundaries, TIGITAL® 3D-Set is offering a brought range of duroplastic materials for SLS 3D-printing. With TIGITAL® 3D-Set duroplastic materials, an innovative material class for 3D-printing in SLS printing are introduced.

duroplastic materials provides an enhanced chemical network and bonding. With these Thermoset materials, new advanced properties are created. By providing higher temperature resistances and better properties for heat, UV and flame-retardant parts these materials can advance the industrial usage of 3D-printing.

Use cases can be within sensitive industrial as e.g. for public transportation as rail, public buses or airplanes. These industries have the highest requirements when it comes to durability and flame retardancies. In most cases conventional materials are coming to their borders. TIGITAL® 3D-Set thermoset materials can fulfill flame retardant requirements in accordance to ECE R118 and DIN EN 45545. Providing the possibility to fulfilling these requirements it opens a new field for 3D-printing in the field of public transportation and increases the potential usage of parts for more than only this industry.

Mohamad Tarek Ibrahim Amin Farag
Sierra Engineering & Manufacturing, Egypt

Biography

Mohamad Tarek Ibrahim is a Mechanical Design Engineer who is specializing in Double Suction Centrifugal Pumps design, He has successfully Designed more than 15 pumps and some of them already operate at sites with sufficient hydraulic and mechanical performance, The wide range of pumps (60-1500 L/s Capacity) and (20-160 mwc Head) gave me the experience to develop the newer generations of pumps aesthetically and hydraulically. He is using high-tech for example, and not as a limitation SLM to develop the design of the impeller and the pump. Also, participated in the Mega Oil&Gas project "110 m diameter crude oil tank" as the youngest Site Manager in PETROJET the mega Oil Gas Company in the middle east, and the project was Genius awarded as the largest floating roof tank in the world.

Metal 3D Printing in Impeller Manufacturing

Pump construction has always been an advanced science specially the pump's heart; the Impeller, back when Karl Pfleiderer developed the vane's inlet velocity formula, the sensitivity of the vanes dimensions and angles became crucially affecting the hydraulic performance and the pump's efficiency. Pump manufacturers mostly use an ordinary corebox to shape the water cavity inside the impeller, in SIERRA we have even developed this method with TWO high technology methods.

The first Metal 3D Printed Vanes in Egypt, we have used LASERTEC 30 SLM 2nd Gen. SLM 3D printer (One of a kind in Egypt) from DMG MORI. Using the brilliant METAL POWDER STAINLESS STEEL 1.4404 / 316L from Heraeus GmbH. Our vane is well calculated thus, it needs to be manufactured exactly as per designed, and we managed to manufacture it this right way.

Qingyuan Wang
Chengdu University, China

Biography

Wang Qingyuan, PhD, Second-grade Full Professor, doctoral supervisor, is currently the Deputy Secretary of the CPC Committee and President of Chengdu University. After graduating from Ecole Centrale de Paris with a doctoral degree, he successively undertook post-doctoral research at Purdue University in the USA and worked as a Research Fellow in JSPS, Japan. He is also the winner of the National Science Fund for Distinguished Young Scholars, Changjiang Scholar, Leader of Innovative Team of the Program for Changjiang Scholars and Innovative Research Team in University of the Ministry of Education, a national candidate of the New Century Talents Project, an outstanding candidate selected by the Ministry of Finance for the Hundred Talents Program of the Chinese Academy of Sciences, an expert entitled to Special Government Allowance of the State Council, New Century Excellent Talent of the Ministry of Education, director of the National High-quality Course of Mechanics, an academic and technological leader in Sichuan Province, well-known teacher and leader of Excellent Teaching Team in Sichuan Province.

Dr. Wang is mainly engaged in the research of new materials and structural mechanics, ultra-long life fatigue and reliability, experimental mechanics, consolidation of structural seismic-resistant composite materials and their durability, construction waste recycling and low-carbon technology, etc.

He has undertaken 5 projects funded by the National Natural Science Foundation of China including major scientific and research instrument projects, as well as over 10 projects involving innovative teams and international cooperation. Besides, he also published over 80 SCI papers and over 120 EI papers, and these papers have been cited by others more than 1,000 times. He has mentored 5 post-doctors (including 2 foreign post-doctors), who have completed their research in the postdoctoral station, 11 doctoral graduates and 27 master graduates. Now he serves as Associate Editor-in-Chief ofJournal of Experimental Mechanics and Editorial Board Member of seven journals includingFFEMS. He is also President of the 6th International Conference on Very High Cycle Fatigue (2014-Chengdu). In 2006, his research on ultra-long life fatigue was awarded the first-class Natural Science Prize of the Ministry of Education.

Defect-correlated very high cycle fatigue performances of additively manufactured Titanium and Nickel alloys

Research on the very high cycle fatigue (VHCF) of metals produced through laser additive manufacturing has the potential to significantly advance the application of these materials in critical equipment requiring extensive service lives. By the advantage of loading frequency from ultrasonic fatigue testing, this study delves into the VHCF characteristics of certain key alloys created via laser powder bed fusion (LPBF), including IN718 superalloy and Ti6Al4V alloy. These alloys exhibit notably reduced fatigue strength compared to their wrought counterparts, particularly within the VHCF domain. A distinct S-N curve may emerge, reflecting the competing failure mechanisms of surface versus internal crack initiation. Fatigue cracks can originate from manufacturing defects such as gas pores and lack of fusion, as well as from columnar grains in the matrix. The K-T diagram is employed to analyze the critical defect size that leads to fatigue failure. A novel parameter model, predicated on defect characteristics, has been developed to assess fatigue life. The fine granular area (FGA) consists of numerous discontinuous nanograins, stemming from grain refinement processes. This refinement is linked to the movement and accumulation of dislocations within martensite laths. The accumulation and reorganization of dislocations in these laths lead to the formation of dislocation cells, which evolve into nanograins and low-angle grain boundaries.

Bratucu David-Iustin
Andrei Saguna National College, Romania

Biography

Bratucu David-Iustin is a second year students of natural sciences intensive English at "Andrei Saguna" National College in Brasov, Romania. He received numerous awards in scientific competitions, such as the II prize in the "NSS Space Settlement Contest" and shared his research at the ISDC 2023, Texas, USA. He also took hold of the bronze medal within the "IYNT" tournament. At the moment, his interests revolve around the field of Earth sciences. Given this reason, David is looking forward to learning and taking part in a recognized conference, like Earth Science 2024.

Considerations regarding a climate change, food security, trusability NEXUS for assuring the food security in the agriculture field

Nowadays, the food industry becomes more and more vulnerable to climate change. The new circumstances determine food producers to approach in an integrated way the main factors that influence their activity. Given this context, we studied the correlation between a consumer and a producer in the agricultural environment. One of the impacts that climate change has upon life is found in agriculture and food security. This paper aims to evaluate both in a contextual framework and also from an operational standpoint the foremost factors that influence the food security and environmental impacts. It also establishes the process in which these factors interrelate, establishing a NEXUS. The findings follow the guidelines in conformity with FAO, attempting to highlighting the importance of environmentally-friendly and healthy food products.

Therefore, this paper aims to answer the following questions: What makes a product eco-friendly? How can we make food production more sustainable?

In the attempt of obtaining the expected results, a series of analyses and research has been realized, targeting both the conceptual delimitation of the major terms intended: Food Security, Climate change, Trasability, and the evaluation of the way in which they are kept in mind by the local producers in the Brasov region through qualitative research.

The main objective of this research was to identify the perception of people in the case of food manufacturing. We considered the following sections: 1. Introduction; 2. Conceptual delimitation; 3. Methodology; 4. Results; 5. Conclusion; 6. Limitations of the research.

Tescasiu Bianca-Ioana
Andrei Saguna National College, Romania

Biography

Tescasiu Bianca-Ioana is second year students of natural sciences intensive English at "Andrei Saguna" National College in Brasov, Romania. She received numerous awards in scientific competitions, such as the II prize in the "NSS Space Settlement Contest" and shared her research at the ISDC 2023, Texas, USA. She has also taken hold of the bronze medal within the "IYNT" tournament. At the moment, her interests revolve around the field of Earth sciences. Given this reason, Bianca is looking forward to learning and taking part in a recognized conference, like Earth Science 2024.

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Calin Dancu
Andrei Saguna National College, Romania

Biography

Calin Dancu is a student at the "Andrei Saguna" National College in Romania. He had participated in several international competitions. Among these, "he counts the NSS Space Settlement Competition and the International Young Naturalists' Tournament, winning the silver and bronze medals, respectively. He also participated in the NSS spUN Debates, managing to win the competition. Besides these contests, he also separately has been a part of other top competitions. Calin has acquired the 5th prize in the National German Olympiad.

Study on the effect of personal behavioral characteristics on the air pollution levels in Brasov, Romania

This study aims to explore the root causes of air pollution in Brasov, Romania by overlapping data points received from survey responses and interviews with maps displaying pollution levels across the city's different districts. By mapping pollution data across the city, we can gain a deeper understanding of the factors contributing to this issue. There is little existing research on this topic, particularly when it comes to individual actions that significantly impact pollution levels. This is especially true in the case of Brasov, where research on the topic is limited.

We have pinpointed the most polluted areas in Brasov and correlated this information with survey responses to detail individual habits and behaviors that affect air quality. With a substantial amount of data points, we can track the biggest sources of air pollution for individuals in designated age groups and identify specific areas where environmentally harmful events occur.

Additionally, we have identified three positions on the Globe (Salzburg, Chur, Bolzano) which present similar climate conditions. In these areas, we have studied pollution maps, which led us to generally applicable results.

Through this approach, we gained a better understanding of this issue and identified specific behavioral changes that can help reduce pollution levels in these areas. Therefore, the paper underscores the responsibility of each individual in contributing to environmental damage and the need to raise awareness of their actions.

Aldea Dragos Andrei
Andrei Saguna National College, Romania

Biography

Aldea Dragoș Andrei is a graduate student in Andrei Saguna National College, Romania. His dream is to follow his passion in Earth science. He always wanted to change something in this world and the biggest problem and consider tackling is Climate Change. This project represents our determination to succeed and complete our goal, helping future generations keep the planet healthy.

A Revolutionary Filter for Bovine Emissions

Climate change represents a fundamental threat for human health. More specifically, greenhouse gas emissions are considered to be the biggest factor that negatively influences Global Warming. Currently, it is known that methane emissions are one of the most problematic factors for greenhouse gas emissions. Various studies outline that livestock and manure have the highest impact on methane production, representing 32% of the overall causes. Researchers have attested that bovines can produce up to 220 pounds of methane a year and are the main source of methane production. Even though cow meat production can't be stopped, we can decrease the level of methane exhaled in the air by cattle using the following method proposed. This project's purpose is to implement a law in every country which allows farmers to produce beef in a way that does not harm the environment. This law will be implemented with the assistance of our revolutionary creation. Cows won't be held in open spaces anymore; they will be placed in transparent, glass-made domes in which our methane filter will be inserted to separate oxygen from the methane itself. The remaining methane gas will be recycled and treated in order to produce renewable energy for the farm, such as heat and electricity. This application of the methane filter within cow farms will bring various benefits for both humankind and ecosystem. Not only that the industry won't be affected, and beef consumers will continue to eat the same quality meat, but also the environment will start healing progressively.

Sindie Mihai
Andrei Saguna National College, Romania

Biography

Sindie Mihai is a 2nd year student in Andrei Saguna National College, Romania. His dream is to follow his passion in Earth science. He always wanted to change something in this world and the biggest problem and consider tackling is Climate Change. This project represents our determination to succeed and complete our goal, helping future generations keep the planet healthy.

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Victor Gabriel Stancescu
Andrei Saguna National College, Romania

Biography

Victor Gabriel Stancescu is a 2nd year student at 'Andrei Șaguna' National College in Brasov, Romania. His passion for research and innovation has led to follow the natural science course offered by his school. So far, with guidance from his teachers, he had participated in both national Olympiads for physics and chemistry and international scientific debate contests such as the IYNT. Astronomy is a subject he find especially interesting and which he focus on at the Physics Excellence Centre. This is why he chose the topic concerning the remediation of Earth's stratosphere.

Applications of MRFs in the removal of space debris

Space debris is an ever-increasing problem with consequences that could lead to the entrapment of humans on Earth. A significant part of the issue is represented by objects ranging from 1-10 cm in size. We propose a system involving a group of microsatellites designed for the distribution of a curtain of magneto rheological fluid (MRF) intended to capture the small pieces of debris. The satellites will be placed in lower earth orbit, where the problem is most critical. They would utilise onboard sensing equipment and thrusters to move into the trajectory of incoming particles. MRFs are a type of smart material that have the general properties of a shear-thickening fluid and that can also vary their viscosity when in the presence of a magnetic field. This characteristic is crucial to the design because it would allow us to control the way the material shatters upon impact with incoming projectiles. This would prevent it from also adding more small pieces of debris to the space environment. Its magnetic attribute would allow us to collect the scattered pieces and reconstruct them. The incoming debris would be slowed down by this impact and if it loses enough of its momentum, it will fall to Earth and burn up in the atmosphere, successfully removing it. In conclusion, our project presents a sustainable and reusable way of cleaning up the smaller pieces of space debris which are actually the bigger problem in the Kessler Syndrome. Our satellites would be cost-effective and would require little servicing.

Ana Stancescu
Andrei Saguna National College, Romania

Biography

Ana Stancescu is a 2nd year student at 'Andrei Șaguna' National College in Brasov, Romania. Her passion for research and innovation has led to follow the natural science course offered by her school. So far, with guidance from her teachers, she had participated in both national Olympiads for physics and chemistry and international scientific debate contests such as the IYNT. Astronomy is a subject she find especially interesting and which she focus on at the Physics Excellence Centre. This is why she chose the topic concerning the remediation of Earth's stratosphere.

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Ema Neagoe
Andrei Saguna National College, Romania

Biography

Ema Neagoe is a second year students at "Andrei Saguna" National College in Brasov, Romania. The focus of her study here is on natural sciences, a study field which combines her passion for physics, chemistry, and biology. She has taken an interest in space technology and astronomy since her participation in the "NSS Gerard K. O'Neill Space Settlement Contest", but she also shares an enthusiasm for environmental sciences. She chose this topic because it enables us to delve into both of our fields of interest.

Implementation of space waste management procedures on Earth

Space is regarded as the future place for resource acquisition, but in this paper, it is viewed as the key to discovering new resources on Earth. Waste is defined as something that is no longer useful or usable, but space pushes us to change our perspective. Our paper poses the question of how waste is managed in an environment where pollution is not an option and how this technology can be implemented on Earth. The inspiration behind this work was the concept of space settlements, more specifically, the International Space Station, because it is a controlled environment where efficiency is both feasible and necessary. Throughout our study, we will analyze both liquid and solid municipal waste, as we perceive space settlements as miniature "cities". The focus of our paper is on plastic mass waste, as well as on sewage treatment. With the help of bioreactors, we can both produce and recycle plastic. A hybrid sewage treatment could simultaneously purify water and produce bio plastics from solid sewage waste with the use of anaerobic digestion and methanotrophic bacteria. On Earth, this system could prove its economic worth by extracting metals from the solid sewage waste. Regarding the disposal of plastic, engineered E.Coli bacteria could aid as an alternative method. The conclusion of our paper is that advanced methods of waste management do not only represent a key aspect of stopping climate change, but also help to create a circular economy which will in time justify the cost of these systems.

Tudor Andrei Padurariu
Andrei Saguna National College, Romania

Biography

Tudor Andrei Padurariu is a second year students at "Andrei Saguna" National College in Brasov, Romania. The focus of his study here is on natural sciences, a study field which combines his passion for physics, chemistry, and biology. He has taken an interest in space technology and astronomy since his participation in the "NSS Gerard K. O'Neill Space Settlement Contest", but he also shares an enthusiasm for environmental sciences. He chose this topic because it enables us to delve into both of our fields of interest.

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World Congress on

Earth Science and Climate Change

April 08-09, 2024 | Paris, France

Posters Day 1

Hassan Beigi Rizi
Universite Paris-Saclay, France

Biography

Hassan Beigi Rizi, is a PhD student at University of Paris-Saclay in France. He has different experiences in the domain of mechanic and material engineering specially in additive manufacturing (AM) of polymers and ceramics.

Investigation of Density-Stiffness Scaling Laws in Glass Sponge Structures Fabricated by 3D Printing Method

Various industries, including civil engineering, automotive, aerospace, and biomedical fields, are currently seeking novel and innovative high-performance lightweight materials to reduce energy consumption. Inspired by the structure of Euplectella Aspergillum Glass Sponges (EA-sponge), 2D unit cells were created and fabricated using a Fused Filament Fabrication (FFF) process with Polylactic acid (PLA) filaments. The study examines the scaling laws governing the relative stiffness and yield strength of a lattice structure as its relative density changes. The study also compares the lattice structures to other standard square lattices with diagonal struts (Designs B and C) and non-diagonal struts (Design D) reinforcements. The aim is to establish predictive models and examine the deformation mechanisms involved. The results indicated that for the EA-sponge, the relative moduli and yield strength scaled linearly with relative density, suggesting that the deformation mechanism is stretching-dominated. The structures without diagonal struts (Design D) are identified as bending-dominated and exhibited a significantly higher Young's modulus and initial yield strength than those with diagonal struts (EA-sponge, B, and C), identified as stretching-dominated. Therefore, when designing polymer lattices that are stiff for either tension loading, it is advisable to avoid diagonal struts.

World Congress on

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April 08-09, 2024 | Paris, France

KEYNOTE SPEAKERS Day 2

Carlos A Nobre
Universidade de São Paulo - IEA, Brazil

Biography

Carlos A. Nobre is an Earth System scientist from Brazil. He obtained an Engineering degree in Electronics Engineering from the Aeronautics Institute of Technology (ITA), Brazil, in 1974 and a PhD in Meteorology from the Massachusetts Institute of Technology (MIT), USA, in 1983. He initiated his professional carrier in 1976 at the National Institute for Amazonian Research (INPA), in Manaus, Brazil, as research assistant. He was a researcher with Brazil's National Institute for Space Research (INPE) for over 30 years, where he helped to establish a modern weather and climate forecasting research center (CPTEC-INPE), and was its Director from 1991 through 2003. He created in 2008 INPE's Center for Earth System Science. More recently (2011-2014), he was Ministry of Science and Technology's National Secretary for R&D Policy, where he created in 2011 the National Center for Monitoring and Alerts of Natural Disasters (CEMADEN). He was President of Brazil's Federal Agency for Post-Graduate Education (CAPES) in 2015-2016. He was one of the architects of the Large-Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) and LBA's Program Scientist from 1996 to 2002. He was thesis supervisor of over 30 PhD and MSc students and has authored or co-authored over 200 scientific publications. He was chair of International Geosphere-Biosphere Programme (IGBP) Scientific Steering Committee (2005-2011). He has served in many international scientific committees, such as the UN Secretary-General's High-Level Science Advisory Board on Global Sustainability (2013-2016). Currently, he is a member of the Joint Steering Committee (JSC) of the World Climate Research Programme (WCRP), and of the Rockfeller Foundation Economic Council on Planetary Health. He is a member of the Brazilian Academy of Sciences, the World Academy of Sciences (TWAS) and foreign member of the National Academy of Sciences of the USA. He has participated in many IPCC reports..

The Amazon near a Tipping Point. The Urgent Need of Nature-Based Solutons

The Amazon tropical forest is very near a /pping point of becoming a degraded, opencanopy ecosystem, like a "savanniza/on" of at least 50% of the whole tropical forest. The dry season is 4-5 weeks lengthier over the last 42 years over more than 2 million km2 of forests in eastern and southern Amazon. In part of that area the forest has turned into a carbon source. Modeling studies indicate that if deforesta/on exceeds 20-25% of the total forest and global warming exceeds 2-2.5 C, the /pping point will be reached and more than 50% of the forest would be degraded over 30-50 years, releasing more than 200 billion tons CO2 and affec/ng many other ecosystem services and the immense biodiversity.

Nature-based solu/ons are urgently needed for all the Amazon. They are: 1) GeUng to zero deforesta/on, forest degrada/on and wildfires; 2) Large-scale forest restora/on mostly over the highly deforested eastern and southern Amazon; and 3) Implemen/ng a new socio-bioeconomy of healthy standing forests and flowing rivers. In 2023, there was a reduc/on of more than 50% of deforesta/on compared to 2022 all over the Amazon. During COP28, Brazil launched the 'Arc of Restora/on' project to restore 24 million hectares of deforested and degraded areas in Brazilian Amazon from now to 2050. And there are some ini/a/ves to demonstrate the feasibility of the new sociobioeconomy for the Amazon.

Grazyna Zukowska
University of Life Sciences in Lublin, Poland

Biography

In 1987, She graduated from the Faculty of Agriculture of the Agricultural University in Lublin (now the University of Life Sciences in Lublin). She completed my doctorate in the specialty - soil reclamation and waste management. Currently, she is the head of the Department of Soil Reclamation and Waste Management at the Institute of Soil Science, Engineering and Environmental Management of the University of Life Sciences in Lublin. She works as a university professor. In her scientific work, she researched on agricultural soils and soils transformed as a result of anthropogenic activity, including degraded and devastated soils. She studied the properties of various types of waste that can be used to improve the quality of both agricultural and degraded soils. She is looking for new solutions aimed at increasing the efficiency of agricultural soils and effective reclamation of degraded soils.

Selected properties of degraded anthropogenic soil fertilized with a mixture of coal mining waste and sewage sludge

In Poland, over 70,000 hectares of land are degraded and devastated, which, in accordance with applicable regulations, must be reclaimed. Coal mining wastes are characterized by very good properties of a fertilizing nature. One option for the recovery of coal mining waste is to use it to produce soil-like substrates or fertilizing agents. To produce fertilizers with optimal properties, it is advisable to combine hard coal mining waste with other waste. Municipal sewage sludge or rockwool from cover crops, among others, can be used for this purpose.

The aim of the study was to evaluate the effect of coal mining waste and its mixtures with municipal sewage sludge and waste rockwool from cover crops on shaping selected properties of degraded anthropogenic soil.

The study was conducted in a strict pot experiment. Pots of 12 dm3 capacity were filled with degraded anthropogenic soil with the addition of the mixtures in a 1:1 ratio.

The results obtained confirmed the hypothesis that the addition of coal mining waste and its mixtures with municipal sewage sludge and waste rock wool to the soil optimizes its properties. The use of mining coal waste and waste optimizing their properties for the production of fertilizers can be an effective strategy within the circular economy, which will also increase the efficiency of the management of degraded and poor-quality soils.

Kevin Adair
Fuego del Sol, USA

Biography

Kevin Adair, MA, Co-Founder/ Co-Director of the Social-Eco Enterprize, Fuego del Sol (FdS) in Haiti and the Dominican Republic, is developing and implementing an ecosystem of cross-beneficial ecological innovations in the sectors of clean-cookstoves, beneficial tourism, carbon sequestration/ offset, reforestation, and permaculture in conjunction with community, international, and local partners. FdS is a current recipient of the InterAmerican Bank BlueTech Challenge, which supports innovative ecological sustainable impact-driven projects in the Americas. Kevin holds an MA in Behavioral Economics with Academic Honors from The Chicago School of Professional Psychology and a Double BA with Honors from Illinois Wesleyan University, with continuing education credits from the National Geographic Society Geotourism Ambassador Training, Los Fondos de Capital, un Mecanismo de Financiamiento de Empresas presented by the INCA. FdS Haiti is also a recipient of the Digicel Haiti Entrepreneur of the Year Ecological award and a Livelihoods Development award from the UN-IOM.

Institutional Biomass Gasification Cookstoves Provide Undervalued Global Health, Climate, and Carbon-Offset Opportunities for Globally Underserved Communities

Efficient "improved" cookstoves, introduced to reduce greenhouse gas emissions, are the fastest growing carbon-offset type on the global market, but a recent study by the University of California, Berkeley, concluded that such carbon-credits are potentially overvalued by a factor of 10. In direct contrast to potential carbon-offset overvaluations, an initial efficiency and implementation gasification-stove technology-overview by Social-Eco Enterprise, Fuego del Sol Haiti (FdS), based on data independently tested and generated by Burn Design Lab (BDL), through financial support of the InterAmerican Development Bank (IADB), indicates that current calculations of carbon-offsets for FdS institutional stove implementations may be UNDERVALUED by a factor of 10 or more. The aggregate life-cycle efficiency of FdS recycled biomass fuel in FdS "TLUD" gasification stoves is indicated to be ~20 times more net-efficient than Haiti's status quo cooking method of traditional charcoal cooking when the FdS biomass "TLUD" stove-efficiency/ air impurity BDL data is combined with published lifecycle efficiencies of traditional Haitian charcoal production and cooking. Additionally, data indicates the FdS stove-and-fuel cooking system reduces Indoor Air Pollution by 2:1 for PM2.5 and by 18.7:1 for CO in comparison with Haitian charcoal cooking. PM2.5 and CO are identified as negative health-factors by the WHO and US-EPA, especially with frequent/ daily exposure. The aggregate release of CO2 into the atmosphere is also reduced through cooking with the FdS system in comparison to charcoal. The FdS implementation/ introduction/ adoption model, which is based on the concepts of Behavioral Economics, is introduced and detailed for the purpose of peer review/ evaluation to compete, compare, and contrast with existing status quo stove introduction/ distribution methods. FdS stoves-and-fuel (and similar institutional gasification clean-cookstove implementations) provide a clear available underutilized opportunity to address global health and climate issues via the cooking sector, especially for globally underserved communities.

Jesse Ilan Wainer
Rainforest Reliance Inc., USA

Biography

Environmentalist, Philanthropist, Agricultural Engineer & Entrepreneur: Focusing on Renewable Energy, Climate Change, World Food Security & Indigenous Peoples Rights. Born in Johannesburg South Africa. Studied at the University of the Witwatersrand - B.A. Law. Horticulturist from a young age- engaging and learning from my father's green thumb. Passionate for taking an abstract and making it a physical reality. Produced food and energy products on 5-continents. Involved in all aspects from creation to finished product, sales and marketing. Past decade dedicated to participating in solving the global climate and energy crisis, with emphasis on energy, food security and sustainability. Currently working with indigenous people and rural communities in both Nicaragua and Honduras. Rainforest Reliance – KEEPING THE EARTH IN BALANCE (rainforest-reliance.org) Currently living in Italy undergoing Castor cultivation trials on the Mediterranean and looking to relocate 100- immigrant families to a rural town and municipality that can facilitate a minimum of 50 to 100 homes and a minimum of 1,000-hectares land (arable, non-arable, flat, hilly or mountainous) in order to implement a pilot project with intent to sell to ENI (Fossil Fuel Refinery in Sicily) demonstrating viability.

Working with ETA-Florence Renewable Energies ETA-Florence – Envision. Transform. Accelerate (eta-florence.it) and BIKE Biofuels BIKE workshop: "Up-scaling the production of low-ILUC risk biomass" at the 31st EUBCE - BIKE Project (bike-biofuels.eu) and indirectly ENI Energy Corporation New strategies to decarbonize transport (eni.com) via their Technical Head of Sustainable Lipids out of the University of Torino Energy Department. Looking forward to sharing my knowledge and experiences with collective like-minded piers and industry.

Focusing on: Rural Socioeconomic Revitalization Stimulation via a Renewable Bio-based Castor Economy

Objective: A: Helping the European Transport Industry reach net zero emissions, making all fossil fuel carbon neutral by mixing as an additive 14% of our Castor Based biofuels.

B: Revitalizing and rejuvenating the abundant number of rural towns and cities that are dilapidating by focusing on Rural Socioeconomic Revitalization Stimulation via a Renewable Bio-based Castor Economy generating up to 100-Billion Euros Annually.

Producing Renewable Energy, Bio-Based Consumable Products and Food, based on the proven 4-Returns Scientific Approach to Landscape Restoration, Carbon Sequestration and Biodiversity Conservation. Tackling ALL 17 Sustainable Development Goals.

Scope: Portugal, Spain, France, Italy & Greece.

Results: After over ten-years of research and development we created a unique Patented Protected Castor Plant Variety that is high yielding, long living, drought resistant. Using the Castor Oil obtained we have proven to produce sustainable non-toxic bio-diesel cheaper than toxic fossil diesel.

Methods Used: Standard Bio-diesel production using standard industry oil extraction and methyl ester bio-diesel conversion. Here we take you through the process of converting Castor Oil to Biodiesel https://www.youtube.com/watch?v=oa1LSWad6n0&feature=youtu.be

Each hectare of cultivated castor will produce around 2,400 litres' bio- fuel per year, on burning that fuel around one (1) ton of carbon emissions will be released, on burning 2,400 litres' regular fossil aviation

Sayda Chantal
Rainforest Reliance Inc., USA

Biography

Passionate about life, earth, people, science….

Environmentalist, Philanthropist, Agricultural Engineer & Entrepreneur: Focusing on Renewable Energy, Climate Change, World Food Security & Indigenous Peoples Rights.

Born in Masaya, Nicaragua. Studied at the University of Hispano Americana, Managua, Nicaragua (Business Administration).

Past decade dedicated to participating in solving the global climate and energy crisis, with emphasis on energy, food security and sustainability.

Currently working with indigenous people and rural communities in both Nicaragua and Honduras. Rainforest Reliance – KEEPING THE EARTH IN BALANCE (rainforest-reliance.org)

Currently living with my family in Italy undergoing Castor cultivation trials on the Mediterranean in Noli, Liguria. Working with ETA-Florence Renewable Energies ETA-Florence – Envision. Transform. Accelerate (etaflorence.it) and indirectly ENI Energy Corporation New strategies to decarbonize transport (eni.com) via their Technical Head of Sustainable Lipids out of the University of Torino Energy Department (David Chiaramonti). Looking forward to sharing my knowledge and experiences with collective likeminded piers and industry.

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Each hectare of recuperated terrain capture and sequestrate at least 21 tons Carbon per year, by introducing and burning our castor bio fuel, we release only one (1) ton emissions, hence we have a carbon credit of twenty tons eliminating the 86% fossil fuel emissions.

Conclusion: European Castor Biodiesel Production can replace fossil fuels entirely or at least by replacing 14% with our castor based eco-diesel as an additive one would eliminate the carbon footprint of the 86% fossil fuel making it and the cargos voyage carbon neutral.

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SPEAKERS
Day 2

Magdalena Myszura-Dymek
University of Life Sciences in Lublin, Poland

Biography

Magdalena Myszura-Dymek graduated from engineering studies at the University of Life Sciences in Lublin in 2012, and in 2013. She obtained a master's degree at the University of Life Sciences in Pozna? in 2017, She obtained a PhD in agricultural sciences, specialty - soil reclamation. Since 2017, She has been an employee of the Institute of Soil Science, Engineering and Environmental Management of the University of Life Sciences in Lublin, as an assistant professor. In her scientific work, she researched on agricultural soils and soils transformed as a result of anthropogenic activity, including degraded and devastated soils. She studies the properties of various types of waste that can be used to improve the quality of both agricultural and degraded soils. She is looking for new solutions aimed at increasing the efficiency of agricultural soils and effective reclamation of degraded soils.

The impact of reclamation on the enzymatic activity of soil degraded by open-pit mining

The negative impact of anthropopression on the earth's surface is observed mainly in industrial, urban, communication, and agricultural areas. Strong human interference in these areas causes far-reaching deterioration of the physical, chemical, biological, and ecological properties of soils (degradation) or complete loss of use-values (devastation). In order to reduce the negative impact of areas transformed as a result of the opencast mining of minerals (raw materials) and to restore the ecosystem functions of soils, it is necessary to reclaim and reconstruct these areas. Soil enzymes can represent soil quality, especially when combined with other physical or chemical properties.

The aim of the study was to assess differences in the activity of dehydrogenase, phosphatases and urease in soils developing on a substrate of various textures and under various stands.

Six test sites were selected for the studies. The research sites were located on substrates that differed in terms of the soil texture and species composition of the stand.

The obtained results confirmed that soil enzymes can be used to assess the quality of reclaimed soils. The activity of the assessed enzymes in soils formed in the reclaimed areas was significantly dependent on the type of substrate and plant species composition. Within soils developed on the same substrate, the influence of stand species was revealed. The selection of the correct stand species composition to the substrate quality allows for the greatest reclamation efficiency.

Yunus OZTURK
Turkish Ministry of National Education, Turkey

Biography

Yunus OZTURK has completed his doctorate in occupational safety at Marmara University, Institute of Pure and Applied Science. He prepared a doctoral thesis on the effects of heat waves on human health. He completed my doctorate in September 2023. He is currently teaching at a vocational high school..

Investigation of Pharmacy Drug Sales to Determine the Effects of Heat Waves on Chronic Diseases in Istanbul.

Heat waves (HWs) are one of the most important atmospheric events that negatively affect human health. Studies show that HWs trigger many diseases. In this study, changes in drug sales in pharmacies during the HW period were examined to determine the effects of HW on human health. For the study, drug sales data were obtained from 6 pharmacies in different districts of Istanbul and the data were classified according to the indications for which they were used. In the analysis, HW was defined as temperatures that persisted for three or more consecutive days above the 90th percentile of daily maximum temperatures. Using this definition, it was determined that an HW occurred in Istanbul between 12-26 July 2023, lasting for 14 days. Pharmacy data between days 12-26 of each month between April and June were used as reference in the analyses. Risk Ratios (RR) were calculated by comparing pharmacy sales in the HW period with pharmacy sales in the reference periods. Significance values between Temperature and Pharmaceutical sales were examined with the Logarithmic Z test. In the study, it was determined that during the HW period, there was a 40% increase in the sales of Cardiovascular and Blood Pressure drugs, a 33% increase in Psychology and Depression drugs, and a 20% increase in the sales of Respiratory and Pulmonary diseases drugs. As a result of the study, it was determined that high temperatures triggered heart diseases, psychological and respiratory diseases, and therefore the use of drugs for these diseases increased. The results of this study will guide the measures to be taken against HW in the future.

Octavio Farias
NWS_Mexico/UNAM/IPN, Mexico

Biography

Mexican with a Geophysical Engineering, Master's degree in Business Administration and Leadership, as well as a background in Mechanical Engineering. With over 8 years of experience in environmental management, construction, and environmental policies, including 6 years serving as a Climatologist, Meteorologist, writer, and scientific disseminator for Mexico's National Meteorological Service. He is also skilled in weather and climate forecasting on a national scale, and serves as a lecturer at the National Autonomous University of Mexico, teaching courses on numerical modeling and climate modeling. Additionally, he holds multiple international certifications in artificial intelligence, programming, and environmental studies. Outside his professional endeavors, he is an avid enthusiast of triathlons, golf, marathons, motorcycle riding, and singing.

Addressing the Challenges of Climate Forecasting Amidst Climate Change: Insights from Mexico and LATAM

The complexity of climate forecasting amidst climate change presents formidable obstacles to meteorological prediction. Traditionally, Mexico's meteorological service relied on analog years, yet its predictive capacity diminished over time, particularly regarding extreme events.

In this study, we examine how technological advancements have spurred the development of software tools for climate data analysis. However, these programs, predominantly grounded in statistical models, often yield inaccurate forecasts due to limitations in climatology and available data, exemplified by the unexpected rapid intensification of Hurricane Otis.

Forecasting the unknown, adapting to new climate impacts, and managing unprecedented data are pivotal challenges, especially for developing countries lacking advanced technological infrastructure. Urgent action is imperative to advance environmental policies and technology, as evidenced by China's utilization of artificial intelligence and data mining.

Moreover, the social repercussions of climate change transcend the environmental sphere, disproportionately affecting the most vulnerable populations in Latin America. Addressing these issues through a human rights lens is indispensable for ensuring universal dignity and equity.

In conclusion, addressing the complexities of climate forecasting amidst climate change necessitates a multidisciplinary approach and the embrace of cutting-edge technologies. It is crucial to approach these challenges with cultural, political, social, and environmental sensitivity to foster societal resilience and promote inclusivity across all strata of society.

Adnan Sami
University of Haripur, Pakistan

Biography

Adnan Sami completed his graduation, in department of Earth Sciences from University Of Haripur in 2017. He did his Master from University of Haripur in Earth Sciences in 2023,and start his duty as Research associate with Dr. Anwar Qadir in department of earth science. He is enrolled in PHD. He completed many research works and presently working a project that is funded by KPK Irrigation department with Dr. Anwar Qadir. He has participated and presented his findings at various international conferences. His research expertise include, Ground water modeling, hydro geochemistry, hydrogeology, stable isotope analysis and Engineering Geology. He has contributed to the understanding of groundwater resources and their management strategies.

Simulation of ground water lake interaction along Kahal Lake, Haripur area, Khyber Pakhtunkhwa, Pakistan.

The groundwater in the surroundings of Kahal lake in the Haripur area was simulated using the finite difference technique. The study area was discretized in the model into three vertical layers, containing an unconfined and confined aquifer divided by a confining layer. The study area was simulated with the model grid resolution of 300* 300m. Various types of data such as recharge from rainfall, lakes, and streams, evapotranspiration, hydraulic head, specific storage. specific yield, Porosity, etc. were incorporated in the model. The initial model simulation agreed reasonably with the observed heads in steady state with a correlation coefficient of 0.984 and the maximum residual was 39.23m.The steady state shows the variation of hydraulic heads from 600-620 m in year 1980. The transient potentiometric changes in the lake surroundings were revealed in the form of potentiometric maps and the budget analysis. The hydraulic head is varying from 560-800 m in non-steady state up to year 2020. The budget analysis revealed the higher total input 7.15×107than the total output 7.06×107m3.

Julika Voss
BioConsult SH, Germany

Biography

Julika Voss graduated with a Master's degree in Marine Environmental Sciences from the University of Oldenburg in 2021. Her research focus is on marine mammal ecology, and she has gained practical experience in the Azores, Iceland and Italy, as well as statistical experience in analyzing acoustic and visual data from marine mammals. Currently, she is working as a scientist at BioConsult SH in two areas: (1) monitoring the impact of noise from offshore wind farms on harbour porpoises using Passive Acoustic Monitoring, and (2) a new service (SPACEWHALE) that uses artificial intelligence to detect large whales in very high-resolution satellite images

SPACEWHALE: Using satellite imagery to survey whales in remote areas and thus to enhance conservation efforts

Whales and other wildlife species can be detected in high-resolution imagery, and since the advent of very high-resolution satellite imagery in 2014, species identification performs superior. Monitoring whales using satellite imagery now enables surveys to access oceanic areas that have been difficult before using traditional survey methods. Therefore, BioConsult SH and HiDef Aerial Surveying Ltd developed the service SPACEWHALE. It takes a "snapshot" of the area of interest and has the capability to capture very large and remote areas almost instantaneously.

We teamed up a semi-automatic process to evaluate satellite images that combines state-of-the-art artificial intelligence and marine mammal experts' quality assurance. We can answer questions on how many whales, which species and when do they inhabit these areas. The range of end-users of the SPACEWHALE service is broad. EU Governments are required to monitor the abundance and distribution of cetaceans by law (e.g., EU Marine Strategy Framework Directive). Offshore industries are required to assess impacts of their activities through collecting baseline, pre and post construction data. Researchers and NGOs often need monitoring data to support the identification of Marine Protected Areas or Important Marine Mammal Areas, through processes which sadly deem data-poor areas as ineligible.

The SPACEWHALE service has been successfully applied in several projects: in the Mediterranean Sea, the algorithm detected almost twice as many fin whales as a previous manual investigation. In the Bay of Biscay, the algorithm detected fin whales and smaller whale species. SPACEWHALE counted humpback whales off the Hawaiian Islands and Southern Right Whales off the Argentinian coasts and in New Zealand's offshore waters. Besides, we have counted blue whales and several other cetacean and wildlife species off Mexico. We are at a step where satellite-based data informs applied conservation; it has the potential to lift conservation to another spatial level.aking it and the cargos voyage carbon neutral.

World Congress on

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POSTERS
Day 2

Douglas de Castro
Universidade Estadual de Campinas (UNICAMP), Brazil

Biography

Douglas de Castro is a diligent Master's student at the Geosciences Institute of the State University of Campinas (UNICAMP) since 2023; he also earned his Bachelor's degree in Geology from the State University of Campinas (UNICAMP) in Brazil in 2022. He is an esteemed fellow of the Oil National Agency (ANP), where his contributions extend to research in spectral geology, petroleum geology, GIS, and software engineering. With a keen interest in these domains, Douglas is dedicated to advancing knowledge and innovation in his field.

Geoscientific Agility: The use of SCRUM Methodology for Elaborating Geosciences Software Solution

Software development can be carried out using the agile or traditional method, where traditional methods are also known for seeking predictability [1]. Traditional methods have a long-term scope definition and project specification stage, in addition to an inflexible requirements analysis after their definition [2]. create a standard methodology for software development projects related to geology. The software developed as a basis is an application for hyperspectral interpretation in virtual reality. To carry out this work, the benefit of using the SCRUM methodology will be given, given the lack of development similar to software development stages. To achieve the project's objectives, execution based on agility is necessary. According to Highsmith [3], agility can be defined as the ability to adapt and manage changes, constantly supporting balanced and flexible management within the project structure. Within the Scrum methodology, several elements are crucial for its execution. Among the key elements, we have: a Backlog, Backlog, Sprint. Sprint Backlog and the sprint review [4] Having exposed the need for agile management for this project, agile methodologies were raised in order to choose the most efficient one for the present scenario. Pereira [5] points out the main advantages of agile management are creating a convenient environment for possible changes to requirements, facilitating project management, improving the quality of the final product, constantly planning the project to minimize risks, and focusing on the final result. In summary, this work presents how to produce geoscience software step by step, using how scrum techniques can be reproduced in a geoscience context.

Mouhamed Gueye
Miniere Osisko, Canada

Biography

Mouhamed Gueye is an exploration geologist GIT at Osisko Mining, a mining company focused on acquiring, exploring, and developing gold resource properties in Canada. He holds a Master's degree in geology, specializing in mines and quarries, from the Institute of Geosciences in Dakar, where he gained in-depth skills in applied geology for mineral exploration. He also obtained a Master's degree in geology and geological engineering from the University of Quebec in Chicoutimi, further enhancing his expertise in the field of mineral resources. Mouhamed has extensive experience in the mining industry, with particular expertise in geological exploration and mineral resource management.

Application of 3D Modeling to Highlight Karstic Cavities in the Thies Forest in Support of Planning Soil Consolidation Work by Grout Injection on Cement Works: Perspectives on The Influence of Climatic Factors

Constructing cement plants in karstic environments requires careful consideration of the differential settlement issues resulting from the stresses generated by their weight. Grouting works have been widely applied as suitable solutions to these challenges.

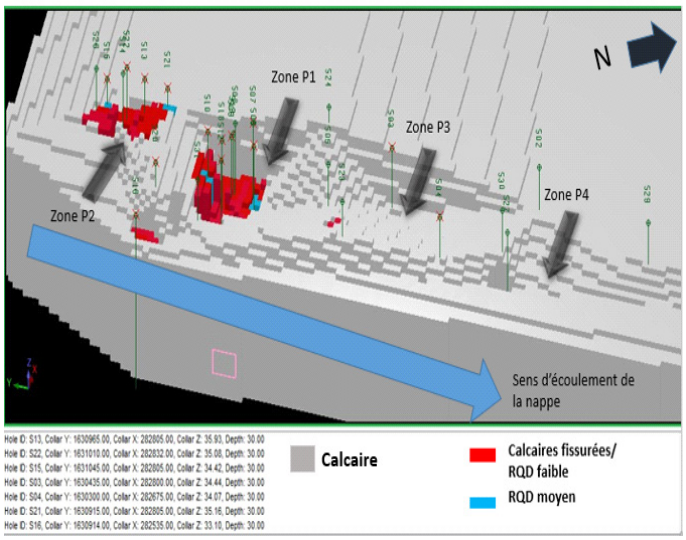
This article explores the prospects of integrating the influence of climatic factors into 3D karst modeling to address the problems of differential settlement in cement plant structures. The study, conducted at the Geosciences Institute of Dakar, used a model block created from drilling data to visualize and appreciate the predominance of karstification in limestone formations.

Four zones susceptible to accentuating settlement risks were detected and identified as priorities for stabilization works. Estimated cavity volumes based on inverse distance interpolation were 56,542.46 m3 out of a total volume of 8,481,369 m3.

The advantages of this approach include a better understanding of karst geometry to guide efforts in planning grouting works, which were previously done without visual support and with high budgets.

The results of this research provide practical recommendations for considering karst structures in the design and management of industrial facilities, while highlighting the importance of 3D modeling and pressuremeter tests in resolving complex geotechnical issues. However, perspectives dictated by a possible integration of climatic factors such as acid rain in cement plant areas, which could lead to long-term limestone dissolution rates, or variations in rainfall linked to cyclical recharge of aquifers, could be determining factors in understanding the dynamic evolution of these karst horizons

BLOCK MODEL FINAL SOUS RQD



Chaimae Karbal
United States

Study of the improvement of soils treated with ecological stabilizers: the example of Earthbind and Top seal white

Rural development is one of the targets of the Proximity Policy conducted by the Moroccan government, and constitutes a real challenge for the overall development of the country. For economic reasons combined with an important ecological concern, the construction of rural roads is carried out in such a way as to avoid the transport of earth, using local materials. To do so, it is necessary to mobilize available soils and make them suitable for driving, by looking for the most appropriate stabilizer. The results of the laboratory tests carried out on a soil in the region of Kenitra, lead to a sand with little clay, low organic content, with a low bearing capacity (CBR = 7%). In order to improve the mechanical performance of the soil, the mass treatment with a stabilizer (Earthbind) has significantly increased the bearing capacity of the soil up to a CBR value of 15%, while the effect of the surface treatment is not as important, in terms of bearing capacity, contrary to its effect on the waterproofing The improved soil can be used as a subgrade for low traffic roads. It is recommended to use the stabilizer during the summer period, especially in non-floodable areas.

Nadia Itzel Castillo Perez
Universidad Veracruzana, Mexico

Biography

Nadia Itzel Castillo Perez is a climatologist by profession, she works on topics of climate change and adaptation. She is currently studying a master's degree in earth sciences with a perspective of adaptation to extremes of precipitation. She did postgraduate studies in political management of climate change with a theme in adaptation and a specialization in public communication of science with a focus on climate change. She studied a degree in atmospheric sciences. When she was doing these courses, she worked with multi and transdisciplinary groups from which she had a great experience. She strongly believes that we can all contribute by spreading the urgency of the climate crisis to promote concrete actions in response to it.

Knowledge gaps in adaptation planning in the Paraná Delta": Collaboration National University of Rosario - Nairobi Work Program of the United Nations Framework Convention on Climate Change (UNFCCC)

This research seeks to contribute to a better understanding of the knowledge gaps on adaptation to climate change planning in the Middle Paraná Delta. The knowledge gathering process was facilitated through comprehensive literature review, interviews, co-creation workshops and virtual meetings with stakeholders over a period of five months – January to May 2022. The research aimed to contextualize and assess the prevalence of gaps and needs identified through the Lima Adaptation Knowledge Initiatives (LAKI). The main results imply the persistence of adaptation knowledge gaps identified by LAKI workshops for the Sub-Andean region. The most prevalent gap is the lack of integrated research on the effects of climate change on ecosystem services and their relationship with the quality of life of populations. The local community is identified as a key stakeholder for adaptation planning processes while national and subnational government actions are perceived as essential for the generation of adaptation responses. Climate change adaptation planning is recognized by the stakeholders as an essential tool to face the threats and risks posed by climate change in the Middle Paraná Delta. An important characteristic of the Delta is its varied biological diversity, which is affected and threatened by anthropic pressure, particularly through the degradation of natural communities and the substitution of environments. The region is also exposed to risks associated with water availability, which implies an impact on hydroelectric production, navigation, and the population that depends on fishing, while conditioning its productive capacity (Milana & Kröhling, 2015). According to global climate models, the area and the activities carried out in the Paraná Delta are affected by temperature rise, increases in average and extreme rainfall and pluvial floods for 2°C of global warming (IPCC, 2021a)

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