

EU and Global South International Cooperation based on reciprocity

Contribution to the debate from the perspective of research projects Booklet

Satellite Event to the 15th High Level Workshop on the ERA

30 November 2023 // Spanish National Research Council, Calle Serrano 117, Madrid, Spain

Programme

Thursday 30 November 2023

- 14.00–14.30** **Registration**
- 14:30-14.40** **Welcome**
- 14.40–15.00** Keynote Speaker
✘ **Jean-Michel Sers**, DG for International Partnerships, European Commission
- 15.00–15.10** Video on Cultural Heritage Research Projects
- 15.10–16.30** **Session 1: Research Cooperation on Cultural and Natural Heritage**
Discussion Panel (5 min each)
- ✘ **Antonio Rosas** (MNCN-CSIC, Spain)
 - ✘ **Maximiliano Fero** (Universidad Nacional de Guinea Ecuatorial, Equatorial Guinea)
PROJECT: *Tesoros Naturales de Guinea Ecuatorial (Natural Treasures of Equatorial Guinea)*
 - ✘ **Andreu Martínez d'Alòs-Moner** (INCIPIIT-CSIC, Spain)
 - ✘ **Worku Derara Megeenassa** (Addis Ababa University, Ethiopia)
PROJECT: *Pathways to Statehood: Authority, Legitimacy and Social Diversity in the Horn of Africa*
 - ✘ **Consuelo Naranjo Orovio** (IH-CSIC, Spain)
 - ✘ **Ivonne Molinares** (Universidad del Norte, Colombia)
PROJECT: *CONNECCARIBBEAN. Connected worlds: the Caribbean, origin of modern world*
- Moderator: **Peggy Oti-Boateng** (Executive Director, African Academy of Science)
- Debate
- Posters
1. *Human origins in Eastern Africa. The Olduvai Gorge Archaeology Project and paleoanthropological research in Tanzania*
Ignacio de la Torre (IH-CSIC, Spain) and **Jackson Njau** (University of Dar Es Salaam, Tanzania)
 2. *New Kingdom Scribes Project: documentation and preservation of burial chambers in Luxor*



Lucía Elena Díaz Iglesias Llanos (ILC-CSIC, Spain) and Supreme Council of Antiquities, (Egypt)

3. *Archaeology & Community Engagement in the Senegambia: from colonial mindsets to creative interactions*

Sirio Canos Donnay (INCIPIT-CSIC, Spain) and Université Cheikh Anta Diop de Dakar, (Senegal)

4. *Developing macroecological models of biodiversity dynamics from incomplete data*

Joaquín Hortal (MNCN-CSIC, Spain) and **Ana Claudia Malhado** (Universidade Federal de Alagoas, Brasil)

5. *Land use change and the dynamics of culpeo fox distribution in the Patagonian shrubsteppe*

Alejandro Rodríguez (EBD-CSIC, Spain) and **Gabriela P. Fernández** (Centro de Investigaciones y Transferencia del Noroeste de la Provincia de Buenos Aires, Argentina)

16.30–17.00

Coffee Break

17.00–17.10

Video on Sustainable Value-chains in New Materials research projects

17.10–17.30

Keynote Speaker

- ✘ **Gerardo Herrera**, DG Internal Market, Industry, Entrepreneurship & SMEs, European Commission

17.30–18.50

Session 2: Sustainable Value-Chains in New Materials

Discussion Panel (5 min each)

- ✘ **Francisco Javier González Sanz** (IGME-CSIC, Spain)

- ✘ **Flor de María Harp** (Servicio Geológico Mexicano, México)

PROJECT: *EU-LAC Partnership on Raw Materials*

- ✘ **Patricia Álvarez Rodríguez** (INCAR-CSIC, Spain)

- ✘ **Amadeu Carlos Dos Muchango** (Universidade Eduardo Mondlane, Mozambique)

PROJECT: *Mozambican resources to prepare 2D/3D graphene materials for industrial wastewater purification*

- ✘ **Yonas Chebude** (Addis Ababa University, Ethiopia)

PROJECT: *Natural zeolites for water purification*

Moderator: **Isabel Díaz** (Vice Presidency for International Affairs, CSIC)

Debate

Posters

1. *The National Geology Plan of Angola (PLANAGEO) in the UTE consortium area. A vast international project critical for CN IGME-CSIC*

José Luis García Lobón (IGME-CSIC, Spain) and Geological Institute of Angola

2. *Innovative Exploration in Critical Raw Materials: Knowledge Transfer to Africa & Latin America*

Ramón Carbonell and **Fernando Tornos** (GEO3BCN and IGEO CSIC, Spain) and University of Zambia

3. *Optimization of Nanostructured Materials Production Using Sustainable Methods for Biomedical Applications*



Lidia Martínez (ICMM-CSIC, Spain) and **Jorge Luis Cholula** (Instituto Tecnológico de Monterrey, México)

4. *Promotion of socioeconomic and environmental development through the circular economy in Mozambique*

Moisés Frías and **Ana Guerrero** (IETCC-CSIC, Spain), **Holmer Sabastano** (Universidade Sao Paulo, Brasil) and Mozambique

5. *New construction with lower carbon footprint from industrial waste in Latin America*

Alicia Pachón and **María Criado** (IETCC-CSIC, Spain) and **Willian A. Aperador Chaparro** (Universidad Militar Nueva Granada, Colombia)

18.50–19.00

Wrap-up

19.00–19.15

Conclusion by Science Europe and CSIC

19.30

Vino Español

Keynote Speakers



Jean-Michel Sers graduated in International and European law and business administration. He is currently Policy Officer at the European Commission – Directorate General for International Partnerships (DG INTPA), in charge of strategic orientations and policy formulation of the EU development cooperation in science, technology and innovation.

From 2014 to 2021, he was the European Affairs Coordinator for CIRAD, the French Agricultural Research Centre for International Development. From 2009 to 2013 he was policy officer in charge of research and innovation cooperation between EU and South Asian countries at the European Commission - DG for Research and Innovation. His tasks included conduct and development of research and innovation policy dialogue with Asian country partners of the EU. During the period 2000-2009, he worked successively in two major French public research organizations implementing energy and agriculture projects. From 1995 to 2000, he worked as project officer at the European Commission - DG Energy, on issues of energy technology promotion and programs coordination and implementation.



Gerardo Herrera is a research professor at the National Centre of the Geological and Mining Institute of Spain (CSIC). He currently works as a Seconded National Expert at the Energy Intensive Industries and Raw Materials Unit of the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission, where he provides scientific support for the analysis of criticality of raw materials and their supply risks, the application of earth observation techniques to develop responsible mining, and strategic agreements on sustainable raw material value chains with Latin America.

Session 1: Research Cooperation on Cultural and Natural Heritage

Projects

Link: <https://youtu.be/HOhTdHW3Ebw>

Posters

1. Human origins in Eastern Africa. The Olduvai Gorge Archaeology Project and paleoanthropological research in Tanzania

Authors: Jackson Njau* & Ignacio de la Torre**

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** Instituto de Historia, CCHS-CSIC, Spain. ignacio.delatorre@csic.es

Abstract

Olduvai Gorge, in northern Tanzania, is one of the most relevant paleoanthropological sequences in the Old World, and has yielded an unparalleled wealth of findings for some of the early stages of human evolution. Olduvai was the first site where evidence of a very early stone tool technology – the Oldowan– was found, and it was also where the first fossils of *Homo habilis* and *Paranthropus boisei* were discovered. This poster introduces research led by the Olduvai Gorge Archaeology Project (OGAP), co-directed by scientists from Indiana University and CSIC at Olduvai Gorge. OGAP has conducted fieldwork at Olduvai since 2008, and has produced relevant archaeological results for the study of the *Homo habilis* to *Homo erectus* transition, between 1.7 and 1.4 million years ago.

2. New Kingdom Scribes Project: documentation and preservation of burial chambers in Luxor

Authors: Lucía Díaz-Iglesias Llanos* & Supreme Council of Antiquities, Egypt

*Instituto de Lenguas y Culturas del Mediterráneo y Oriente Próximo, CCHS-CSIC, Spain. lucia.diaz-iglesias@cchs.csic.es

Abstract

The New Kingdom Scribes Project draws on the new trend of Material Philology to shed light on the intellectual and material processes that underlie the manufacture of inscribed artifacts and on the education and working conditions of the scribes who copied funerary texts found in Egyptian tombs some 3.500 years ago. Although studies of written culture in Egyptology have traditionally focused on papyri and ostraca, the project centers on an under-utilized source: New Kingdom subterranean burial chambers that belonged to members of the Theban high elite and that were decorated with extensive textual programmes.

In 2019, an interdisciplinary team composed of epigraphers, photographers, restorers, archaeologists, chemists, and geologists started fieldwork in three burial chambers built in the Theban necropolis. They belonged to high officials of the reigns of Hatshepsut and Thutmose III (c. 1470 BC): the vizier Useramun (TT 61), his steward Amenemhat (TT 82), and the overseer of the double granaries Nakhtmin (TT 87).

The poster shows the results of the first five seasons of fieldwork (2019-2024) in TT 61 and TT 87, mainly:

- The application of new digital technologies to document the decorated surfaces;
- The epigraphic and palaeographic study of the texts resulting in the identification of scribal hands and working procedures;
- The restoration and conservation measures adopted;
- The application of non-destructive techniques to analyse ancient inks;

- The excavation of the passages leading to the chambers.

3. Archaeology & Community Engagement in the Senegambia: from colonial mindsets to creative interactions

Authors: Sirio Canos Donnay* & Ibrahima Thiaw**

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**Université Cheikh Anta Diop of Dakar, Senegal

Abstract

Local communities have been a central feature of archaeological projects in Senegambia since the earliest research over a century ago, but their contribution has often been erased and their voice denied. This has fortunately started to change, although the weight of inherited colonial epistemologies and their workbench of concepts, modi operandi, languages, and dissemination strategies has limited the depth of the change. In this poster we discuss the outcomes of two recent experiments in community engagement, aimed at making archaeological knowledge more accessible to local communities by rooting them in indigenous worldviews and practices of history-making and consuming.

4. Developing macroecological models of biodiversity dynamics from incomplete data

Authors: Ana Malhado* and Joaquín Hortal**

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Abstract

Addressing the disparities in science, spanning gender equality within countries, institutional divides, and the complexities of North-South dynamics, remains an ongoing dialogue. Throughout two decades of international collaborative research projects in tropical regions, we have gained experience from administrative roles and leading academic research groups in Brazil and Spain. Our experience in Global North-South cooperation projects across South America and Africa has underscored the critical need to comprehend the cultures, strengths, and limitations of our partners, and to build up horizontal and egalitarian relationships where researchers from the global north and south interchange their traditional roles. In this sense, we believe it is imperative to consistently integrate the perspectives, skills, and knowledge of researchers from the Global South at every phase of the research process. Good examples are how international cooperation projects from Brazilian CNPq and Spanish CSIC have used analyses and models developed in the South to explain biodiversity dynamics in the North, and vice versa. Paying insufficient attention to true integration and partnership not only jeopardizes the manifold benefits that genuine cross-cultural collaboration can offer research initiatives, but also risks eroding trust, with far-reaching adverse consequences for future relationships among researchers and institutions. In this poster, we propose a comprehensive framework outlining the pathways toward fostering more equitable, just, and transparent research collaborations between the Global North and the Global South. We illustrate this framework with reference to projects that we have been involved in, exploring both exemplary practices and the pitfalls encountered at each juncture of the research process, from the inception of projects to the dissemination of research findings.

5. Land use change and the dynamics of culpeo fox distribution in the Patagonian shrubsteppe

Authors: Alejandro Rodríguez* & Gabriela P. Fernández**

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**Centro de Bioinvestigaciones (CeBio) - Universidad Nacional del Noroeste de la Provincia de Buenos Aires (UNNOBA)/CITNOBA, Argentina. gabriela.fernandez@nexo.unnoba.edu.ar

Abstract

We explore the effects of the introduction of livestock by the Europeans on the structure of a mammalian predator guild in Patagonian ecosystems. Livestock and parallel persecution of carnivore competitors may have allowed the culpeo fox to expand its geographic range during the last five centuries. We aim to conduct a phylogeographic analysis to test whether the occurrence and timing of changes in fox range are supported by spatial patterns of genetic variation. Research is ongoing and, at this point, we have just completed tissue sampling from pelts kept by farmers after predator control. Next steps are analysing the genetic structure using microsatellite markers in DNA extracted from samples, and examining the congruence of the results with a recent fox expansion across Patagonia. This project is the last outcome of a long-term collaboration with several Argentine research groups. Benefits of funding included:

- Boosting research on the ecology and conservation of remote and poorly studied ecosystems.
- Promoting higher education: training of postgraduate students, both predoc and postdoc.
- Delivering scientific output (publications) and communication (scientific meetings).
- Widening the research network from two institutions in two countries to seven institutions in four countries.

Session 2: Sustainable Value-Chains in New Materials

Projects

Link: <https://youtu.be/2nXyXskWnac>

Posters

1. The National Geology Plan of Angola (PLANAGEO) in the UTE consortium area. A vast international project critical for CN IGME-CSIC

Authors: José Luis García Lobón*, Enrique Merino Martínez*, Javier Escuder Viruete*, Carme Rey*, Raquel Martín Banda*, Jorge Fernández Suárez* & Geological Institute of Angola

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Abstract

The National Geological Plan of Angola (PLANAGEO) has been one of the vital African infrastructure projects in the recent past. The objectives of PLANAGEO were (a) to enhance knowledge of Angola's geological and mineral resources; (b) to foster diversification of the national economy; and (c) to attract foreign investment and promote the country's development.

The project was launched by the Angolan government and implemented by the Geological Survey of Angola (IGEO-MIREMPET). In 2013, IGEO awarded UTE* a contract, valued at USD 115.300.000, to undertake PLANAGEO's activities in the southwestern region of Angola, covering roughly 480.000 km² (one third of the country). From 2014 to 2022, the UTE consortium conducted interdisciplinary studies and investigations that resulted in a comprehensive collection of maps, coupled by high-quality scientific reports, as follows (in summary):

- Geological and airborne mapping at 1:250.000 scale (44 map sheets).
- Raw materials, and Geochemical & Mineral resources mapping at 1:50.000 scale (69 sheets).
- Specific studies (gravimetric, hydrogeological, electromagnetic and passive seismic surveys).

As a result, IGME has taken the lead in understanding underexplored natural resources across Angola's territory, which holds big potential of strategic materials highly demanded worldwide.

*UTE: joint venture comprising CN IGME-CSIC, the National Laboratory of Energy and Geology of Portugal (LNEG) and the Spanish company Impulso Industrial Alternativo (IIA).

2. Innovative Exploration in Critical Raw Materials: Knowledge Transfer to Africa & Latin America

Authors: Fernando Tornos*, Ramón Carbonell**, Imasiku Nyambe*** & John M. Carranza****

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Abstract

CSIC's Geosciences focus institutes BCN3GEO (Barcelona) and IGEO (Madrid) are heavily involved in the exploration of critical raw materials, in both Europe and overseas, with special emphasis in Africa and Latin America. Our work includes scientific research in ore deposit modeling, mineral systems, exploration



geophysics, support to public administrations (Geological Surveys) as well as mining companies and, the development of knowledge transfer activities such as training of young researchers. Research has been funded by the European Union (Horizon 2020, Horizon Europe and EIT Raw materials), Spanish AECI projects, UNESCO and scientific societies (SEG, SGA). Currently, most of the currently developed research is funded through two Horizon Europe projects. The AGEMERA project which aims to develop new interdisciplinary datasets for critical metals and apply innovative technologies for mineral exploration. Within this project, one of the major tests and validation sites is Zambia, where we are actively working in the development of models for Mn and Co mineral exploration activities. The EIS project is oriented to the creation of a new, open access, software for mineral exploration using as test sites several mineralized belts in Europe. Here, the University of KwaZulu-Natal plays a major role in the development of the basic geological and geophysical concepts to be incorporated in the software and EIS tools portfolio.

3. Optimization of Nanostructured Materials Production Using Sustainable Methods for Biomedical Applications

Authors: José Miguel García-Martín*, Yves Huttel* and Lidia Martínez* & Marcelo Videá**, Omar Lozano García** and Jorge Luis Cholula**

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Abstract

Nanomaterials are materials at the nanoscale (one million times smaller than a millimetre). The interest in nanomaterials arises from the fact that they present properties different from their bulk counterparts. For that reason, nanomaterials are very popular in different fields, such as nanomedicine. In particular, metallic nanoparticles (NPs) are interesting for their antimicrobial and anticancer properties [1,2], as well as for drug delivery and their application as contrast agents for imaging [3]. This collaboration project focuses on optimizing NPs production using environmentally friendly routes for their use in nanomedicine. The scaling up of Ag/Au and Cu₂O NP synthesis represents a milestone for future technology transfer for fabricating glucose biosensors using non-invasive methods (avoiding finger-picking). In addition, studies of the cytotoxicity of NPs against breast cancer cells will also be considered. Together, both teams at CONIC and Tecnológico de Monterrey (TEC, Mexico) are facing more complete research with a higher impact following a proof of concept that is the base of this project [2,4]. This proposal is framed within the sustainable development goals (SDG) No. 3. Good-health & well-being; No. 10. Reduced inequalities and No.17. Partnerships for the goals.

Main scientific achievements and on-going projects

- Production and electrochemical evaluation of Cu₂O nanostructures using an environmentally friendly scaling up process.
- Application of Cu₂O nanostructures to fabricate low-cost microstructured devices for the biosensing of glucose sensing.
- Evaluation of the cytotoxicity of Ag/Au NPs towards a breast cancer cell line.
- Production of Ag/Au nanostructures using sputtering techniques.

4. Promotion of socioeconomic and environmental development through the circular economy in Mozambique

Authors: Moisés Frías and Ana Guerrero* & Holmer Sabastano**

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Abstract

The proposal “Promoting socio-economic and environmental development through circular economy in Mozambique (Fo4R_Mozambi)”, aims to set up a series of initiatives and tools to facilitate cooperation between research groups in Spain (Dr. Frías Recycling Materials-IETcc-CSIC,) and Mozambique (Dr. Manhique-Eduardo Mondale Univ., UEM) with the support of Dr. Savastano-Univ Sao Paulo-Brazil. These groups are united by their knowledge on Reduction, Reuse, Recycling and Recovery (4R) of local waste in order to promote the socio-economic, cultural and environmental development of Mozambique. This collaborative work targets the more sustainable materials and technologies for civil construction and infrastructure that could be progressively adopted by the local companies. It is supported by the Government of Mozambique and the Brazilian industrial sector, as evidenced by the letters of support: Engineering Laboratory Mozambique (Ministry of Public Works, Housing and Public Works-LEM), IMBRALIT Company and BAMBUILD Start-up Company. The main driver of this proposal is the training of researchers and students, technologists and technicians linked to the construction industry and/or waste generation. In the medium term, the present project, depending on the results and the economic situation, could lead to a collaboration agreement between the CSIC and the Eduardo Mondlane University (UEM), with the aim of the CSIC becoming a benchmark for the training of Mozambican research personnel in sectors of interest to the country's national industry.

5. New construction with lower carbon footprint from industrial waste in Latin America

Authors: Alicia Pachón* and María Criado* & Willian A. Aperador Chaparro**

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Abstract

The CR11 project (New construction with a lower carbon footprint from industrial waste in Latin America), is being developed between the Universidad Militar Nueva Granada de Colombia (Bogotá) and the Instituto de Ciencias de la Construcción Eduardo Torroja (IETCC-CSIC) (Madrid).

The project focuses on the development of sustainable cementitious materials that encapsulate, without risk to the environment, waste from the extraction of hydrocarbons provided by S.G.I. Hidrocarburos (Bogotá), where industrial by-products are used as raw materials to produce alkaline cement, which is intended to achieve technological results similar to Portland cement.

The alkaline cements developed are composed of rice husk ash that originates as waste from the drying of cocoa in companies such as Casta Roja in Ecuador and fly ash from the combustion of coal in thermoelectric plants in Colombia.

The durable properties of the materials are studied in concrete specimens in Bogotá and in paste specimens in Madrid and according to the best results; finally, a cementitious formulation will be used to manufacture pigsties as an application. In addition, together with professors of the Environmental Engineering degree of the ECI University, an environmental impact assessment will be carried out to allow impact mitigation and restoration processes in the study areas.