



10th - 18th October, 2020
Fez, Morocco



Sidi Mohamed Ben Abdellah University of Fez, Morocco

In partnership with
Hassan II University, Casablanca
Cadi Ayad University, Marrakech
Ibn Zohr University, Agadir
Chouaib Doukkali University, El Jadida

Organizes

**The 28th Colloquium of African Geology
CAG28**

And

The 18th Conference of the Geological Society of Africa (General Assembly)

10-18 October 2020

Theme

**“Geosciences: the priceless substrate for African
economic and social development”**

FIRST ANNOUNCEMENT

Under the auspices of:

- The Geological Society of Africa (GSAf)
- The State Secretariat for Higher Education and Scientific Research
- The Ministry of Energy, Mines, Sustainable Development, and the Geological Survey of Morocco
- The Hassan II Academy of Sciences and Technology
- The National Centre of Scientific Research and Technology

WHY MOROCCO? WHY FEZ?

The 17th General Assembly of the Geological Society of Africa held at Aveiro (Portugal) during the CAG 27, assigned the organization of the 28th session of the Colloquium of African Geology (CAG 28) to Fez University, Morocco.

Morocco is situated in the North West of the African continent. It is close to Europe and Middle East. Morocco is called “Geologist’s Paradise” (Géologues. SGF, n° 194. September 2017) due to:

- 1) The diversity of the very well outcropping terranes spanning from Archean to Quaternary;
- 2) The location at a triple junction between Africa, Atlantic Ocean and the Alpine belt system;
- 3) The particular topography, Toubkal is the highest non-volcanic summit in Africa;
- 4) The famous fossils, minerals and meteorites. They are exposed in natural history museums in many countries attracting a large number of amateurs and specialised researchers;
- 5) The various natural resources including phosphates of late Cretaceous and early Cenozoic formations. Morocco has the largest resources and is the largest producer of phosphates and derivatives in the world. Other important resources are rare metals and REE, Au, Ag, Co in Proterozoic Ore deposits (Anti-Atlas) with the famous world class Imiter and Bou Azzer mines;
- 6) Oil and gas, on- and offshore is currently very active with many positive indicators.

Fez is the cultural and spiritual capital of Morocco; it is situated in central northern Morocco. Fez hosts four universities: **1)** Al Quaraouiyine University founded in the 9th century and considered the oldest university in the world according to UNESCO and Guinness World Records; **2)** Sidi Mohamed Ben Abdellah (USMBA) University was founded in 1975. It holds many faculties: Medicine, Pharmacy, Law, Economics, Arts and Humanities, Engineering schools and 2 faculties of Sciences and their Geology departments; **3)** The private Euro-Mediterranean University enclosing Business, Architecture, Political and Engineering high schools and **4)** The Private University of Fez specialised in Civil Engineering, Renewable Energies and related Architecture and Urbanism domains.

A strong team from Moroccan universities and associated organizations provide a very rich and fruitful CAG28 session for all African and worldwide participants, with friendly, professional and scientific exchanges as the main goals.

On behalf of the Organizing Committee.

Prof. Y. DRIOUCH, meeting chair

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MESSAGE FROM THE GSAF PRESIDENT: PROF. OLUGBENGA OKUNLOLA



The Colloquium of African Geology (CAG) is a major biennial meeting organized under the auspices of the Geological Society of Africa (GSAf), where earth scientist globally have the opportunities to present their research results on topics related to Africa and surrounding areas on a continental and international scale. It also affords the incubation, generation and execution of initiatives that lead to interaction between the Academia, Industry and the Society.

Professor W.Q Kennedy, assisted by Tom Clifford, convened the very first Colloquium of African Geology (CAG) at the University of Leeds during the Easter vacation in March 1964. There was a pulse of excitement that electrified the assembled audience from Africa, Europe, North and South America, Australia and New Zealand when Prof. Kennedy announced his new concept of a ‘Pan-African thermo tectonic event’.

Since the first colloquium in 1964, several European and African countries have hosted this Colloquium. The African countries that had a chance to organize this event were Swaziland, Zimbabwe, Morocco, Mozambique, Tunisia, South Africa, Ethiopia, Tanzania and Nigeria. It returned back to Europe, in 2018 and was held in Aveiro, Portugal based on the decision of the Geological Society of Africa (GSAf) General Assembly held on November 2016 at the University of Ibadan, Nigeria. During the 27th Colloquium, the organization of the next Colloquium of African Geology (CAG28) as well as the 18th Conference of the Geological Society of Africa was assigned to Morocco, for October 2020. The theme of the Colloquium is:

“GEOSCIENCES: THE PRICELESS SUBSTRATE FOR AFRICAN ECONOMIC AND SOCIAL DEVELOPMENT”

Senior and early-career earth scientists from universities and other high education institutions, associations, mining companies, civil societies, politics, and media will be welcome from all over the world especially but not limited to career scientists from African Countries and other developing areas. These representatives will be from different countries and will also be active at the national level. The participation of these individuals from different sectors and countries will enhance international collaborations.

Morocco, the host country is an interesting, geologically heterogeneous country with its allure of the igneous, metamorphic and sedimentary rocks hosting diverse mineralizations that have contributed, and still contribute immensely to the economy of the country. This is in addition to the alluring geomorphic landscapes of immense geotouristic aesthetics. Fez, the host city, is a famous, culturally rich town and a centre of learning is no less alluring. The interesting geoscientific sessions and excursions that will be highlighted in the circulars, promise to be enriching and beneficial.

I enjoin all geoscientists globally to register and be prepared for an interesting and geologically fulfilling time in Morocco from October 10th to 18th 2020 as the CAG 28 unfolds.

Prof. O. Okunlola

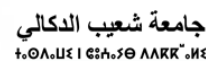
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PARTNERSHIP

The Colloquium is organised by Sidi Mohamed Ben Abdallah University of Fez in partnership with Hassan II University of Casablanca; Cadi Ayad University, Marrakech; Ibn Zohr University, Agadir; Chouaib Doukkali University, El Jadida. This partnership and association are based on the high-level expertise in Geology of these five universities. In addition, an event of continental importance needs to mutualise expertise on the whole of geology fields as well as the financial and organisational aspects.



Université Sidi Mohamed Ben Abdallah
Université moderne, créative et entrepreneuriale



Representatives are :

- ↘ Sidi Mohammed Ben Abdellah University (USMBA) - Fez,
Youssef DRIOUCH (youssef.driouch@usmba.ac.ma, ydrriouch@gmail.com)
- ↘ Hassan II (UH2C) University - Casablanca,
Omar SADDIQI (omarsaddiqi@yahoo.fr)
- ↘ Cadi Ayad University (UCAM) - Marrakech,
Abderrahmane SOULAIMANI (soulaimani@gmail.com)
- ↘ Ibn Zohr University (UIZ) - Agadir,
Moha IKENNE (m.ikenne@uiz.ac.ma)
- ↘ Chouaib Doukkali University (UCD) - El Jadida,
Nasser ENNIH (ennih.n@ucd.ac.ma)

Please feel free to contact anyone of these representatives in order to prepare, propose, suggest or discuss any CAG28 related topic or proposition.

ASSOCIATED ORGANIZATIONS/SPONSORS

- **MANAGEM GROUP:** Morocco
- **ONHYM:** Office National des Hydrocarbures et des Mines, Morocco
- **UM6P & OCP:** Mohamed VI Polytechnic University, UM6P and Cherifian Office of Phosphates, OCP Group, Morocco
- **BRGM:** Bureau de Recherches Géologiques et Minières (France)
- **AMST:** Association Marocaine des Sciences de la Terre
- **AMG:** Association Marocaine des Geosciences
- **AAWG:** African Association of Women in Geosciences
- **ATTARIK Foundation:** Association for promoting Meteoritics and Planetary Sciences, Morocco
- **AFIPS:** Africa Initiative for Planetary and Space Sciences, International
- **APPGM:** Association for protection of geoheritage in Morocco.
- Fez-Meknes region
- Fez Municipality



We will try to build bridges with all direct and indirect acting organisms in geology, social, environmental, touristic and economic related areas. The civil society is associated to this event by different associations.

BY DOING THIS WE BELIEVE IN THE IMPORTANCE OF GEOSCIENCES AS AN ESSENTIAL LEVER FOR SUSTAINABLE ECONOMIC AND SOCIAL DEVELOPMENT IN AFRICA.

ORGANIZING COMMITTEES

Honorary Committee

- His Excellency the Minister of National Education, Vocational Training, Higher Education and Scientific Research
- His Excellency the Minister of Energy, Mines and Sustainable Development
- The Perpetual Secretary of Hassan II Academy of Sciences and Technology
- The Presidents of USMBA-Fez, UH2-Casablanca, UCA-Marrakech, UIZ-Agadir and UCD-El-Jadida Universities
- The director of the National Centre of Scientific Research and Technology
- The President of the Geological Society of Africa
- The General Director of ONHYM
- The CEO of MANAGEM Group
- The CEO of OCP Group
- The Deans of Dhar El Mahraz Faculty of Sciences and Saïss Sciences and Technology Faculty

USMBA Organizing Committee: Coordination Committee

Geology department actors (FSDM, FST) of Fez University will be strongly involved in the local organisation of this important continental event. The coordination of CAG28 related tasks are assigned to the following team:

- Youssef DRIOUCH (Meeting Chair)
- Mohammed BELKASMI (General Secretary)
- Samira ADIL (Treasurer)
- Mohamed DAHIRE (Treasurer)
- Lahcen GOURARI (FSDM Geology Department Head)
- Ahmed NTARMOUCHANT (Lab. LGRN Head, Fez)
- Abdel-Ali CHAOUNI (FST Environment Department Head)
- Abdennasser BAALI (Lab. GEDD Head)
- Ali BELKHIRI (Web Developer)

National & International Organizing Committee

- Hasnaa CHENNAOUI Aoudjehane (UH2C, Meteoritical Society, President ATTARIK Foundation and SG APPGM hassna.chennaoui@univh2c.ma, chennaoui.hasnaa@gmail.com)
- Ezzoura ERRAMI (UCD, AAWG President, errami.e@ucd.ac.ma)
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- Lhou MAACHA (Exploration Executive Director, MANAGEM, l.maacha@managemgroup.com)
- Es-Saïd JOURANI (Geology Director, OCP group, e.jourani@ocpgroup.ma)
- Jean-Claude GUILLANEAU (International Division Director, BRGM, France, ic.guillaneau@brgm.fr)
- Nasrddine YOUBI (Cadi Ayyad University, Marrakesh, youbi@uca.ac.ma)
- Ahmed BENLAKHDIM (Head, Geological Survey of Morocco, MEMDD, a.benlakhdim@mem.gov.ma)
- Thierry BAUDIN (RGF Project Manager, BRGM. France, t.baudin@brgm.fr)

- Mostafa BENZAAZOUA (Geology and Sustainable Mining, UM6P, Mostafa.BENZAAZOUA@um6p.ma)
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- Mohammed BOUABDELLAH (Mohamed 1st University. Oujda, mbouabdellah2002@yahoo.fr)
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- Moulay Ahmed BOUMEHDI (Dept Head, Marrakesh University, boumehdi@uca.ac.ma)
- Fida MEDINA (President AMG, amgg.morocco@gmail.com)
- André Michard: Emeritus Professor. Orsay University (Paris, France, andremichard@orange.fr, micharda79@gmail.com)

SCIENTIFIC COMMITTEE

To be communicated in the second announcement

SCIENTIFIC AND TECHNICAL PROGRAM

The general program structure will be as follows:

- Preconference fieldtrips and workshops from **10th to 11th October 2020**;
- Conferences, plenary and technical sessions will take place from **12th to 15th October**;
- The General Elective Assembly of the Geological Society of Africa on 14th October after programmed plenary sessions.
- The Conference Dinner will be scheduled on **15th October**.
- Postconference fieldtrips and cultural activities are scheduled from **16th to 18th October**.

THEMATIC SESSIONS OF THE COLLOQUIUM

Fundamental and Applied Geosciences

- Geosciences Education in Africa
- Igneous and Metamorphic Petrology and Petrogenesis
- Geochemistry and Isotope Geology
- Meteorites, Impact Craters and Planetology
- Tectonics and Structural Geology
- Stratigraphy, Sedimentology & Palaeontology
- Coasts and Continental Margins
- Quaternary Systems
- Ocean Geosciences
- Geophysics, Geo-informatics, Remote Sensing, Geodesy, Geomagnetism, Seismology
- Databases and Digital Infrastructures
- Mineral Resources: Ore forming processes and Energy resources
- Geothermal Energy
- Oil and Gaz in Africa
- Hydrogeology and Water Sustainability

- Weathering, Climate and Surface Processes
- Geoparks, Geotourism and Geoethics
- Geoheritage in Africa
- Geohazards, Natural and Human-Induced Environmental hazards and disasters
- Urban Geology
- Medical Geology as an Integrated Approach in Geology.

The making and growth of the African crust through geological times

- Archean old shields and their greenstone belts
- Paleoproterozoic evolution and Eburnean orogeny
- Mesoproterozoic and Panafrican (Neoproterozoic) orogenic cycles around old cratons
- Palaeozoic orogenic events.
- The Mesozoic-Cenozoic phases and the Alpine fold belts.
- Quaternary Geology in Africa

CONFERENCES, WORKSHOPS AND COURSES

Plenary lectures will take place at the beginning of every day of the Colloquium.

The main sessions of the scientific program will begin with a keynote address.

One or two pre conference days will be scheduled for courses and trainings. Delocalisation of these activities is possible in connection with pre- and post-conference fieldtrips.

We have already proposals for the following workshops:

- ✓ U-Pb Geochronology (Prof. N. Youbi):
- ✓ Modelling metamorphic processes (Prof. Y. Driouch)
- ✓ Large Igneous Provinces (LIPs) research frontiers (including resource exploration and climate change, Prof. N. Youbi)
- ✓ Identification of Meteorites (Prof. Hasnaa Chennaoui)
- ✓ Geoheritage : a tool for sustainable development in Africa (E. Errami)

FIELDTRIPS

Nearly all the testimonies of the evolution of African crust from the Archean to present times are well exposed in Morocco and record the main related orogenic cycles. The Reguibet shield has well exposed Archean and Paleoproterozoic terranes. Pan-African units crop out in Ouled Dlim area, West of Reguibat shield. Terranes and their greenstone belts spanning from Paleo- to Neoproterozoic are famous at the Anti-Atlas structural domain, with their Phanerozoic cover. The Variscan orogeny can be easily studied (Palaeozoic terranes are slightly affected by alpine orogenic cycle) in Eastern and Western Mesetas. The Atlas system provides well exposed Mesozoic to Cenozoic sedimentary series representing a part of the break-up of Pangea in Africa, that have been deformed during the Alpine orogenic cycle. Finally, the Rif belt, which is a part of Gibraltar orogenic arc, is the more recent orogen in Africa. All these structural domains contain their own ore-deposits. Morocco is also one of the richest countries in meteorite falls and related impact craters.

During these excursions, delegates will have the opportunity to experience Moroccan cultures, both Arabic and Amazigh with their historical contexts, traditions, folk arts, handicrafts, the famous Moroccan cuisine, places of tourist interest, wildlife and much more.

A variety of geological excursions will be proposed depending on the participant's indication of interest and on the participant numbers. Please do not hesitate to communicate with us in this respect. Nevertheless, some fieldtrips are proposed here.

Pre conference short fieldtrips (1-2 days) in areas close to Fez city: Rif, Middle Atlas, Haute Moulouya and North-Eastern part of Variscan Central Massif;

Around Fez: Saiss plain-Prerif (1 day). Visit of hot springs of Sidi Harazem and Moulay Yacoub.

Middle Atlas and Haute Moulouya Valley (2 days).

- Middle Atlas aborted rift from Triassic to Cenozoic and Quaternary.
- Aouli Mibladen Paleozoic inlier and its mineralized Triassic-Jurassic cover (Pb, Zr, V, etc...).

Post conference long fieldtrips in 3 to 4 days guided tours in the main geological domains of Morocco.

- Rif Belt. Mediterranean Alpine Belt: A transect from Fez to Beni Bousera (3 days, minimum 10 participants).
- Transect from Fez to Ouarzazate (4-6 days, minimum 15 participants) comprising:
 - Moroccan Variscan Belt and its Meso-Cenozoic undeformed cover (From Fès to Marrakech):
 - Central, Rehamna and Jebilet massifs and related ore deposits;
 - Meso-Cenozoic undeformed cover of the Palaeozoic formations, comprising Cretaceous-Eocene phosphate basins with visit of OCP sites and UM6P.
 - High Atlas and Anti-Atlas (from Marrakesh and Ouarzazate) comprising the following topics
 - Central and Western High-Atlas geodynamics;
 - Volcanic successions, dyke and sill swarms of the Central Atlantic Magmatic Province (CAMP) of High Atlas and Anti-Atlas;
 - Main Anti-Atlas inliers. Evolution of Northwestern West Africa Craton orogenic belt from Paleoproterozoic to Neoproterozoic terranes with special emphasis to Mesoproterozoic and Paleoproterozoic dyke and sill swarms of the Anti-Atlas;
 - Visit of world class ore deposits of Bou Azzer (Co) and Imiter (Ag).
- Reguibat Schield, Ouled Dlim units (Mauritanides) and their Meso-Cenozoic cover (3 days from Dakhla to Awserd and Tichla, minimum 10 participants including flight Casablanca-Dakhla).

PUBLICATIONS: SPECIAL ISSUE OF THE JOURNAL OF AFRICAN EARTH SCIENCES

The Journal of African Earth Sciences (JEAS) is the official journal of the Geological Society of Africa. A Memorandum of Understanding that aims to encourage and help African geoscientists to publish in a high-level international scientific journal links us. Many special issues have been already dedicated to several African meetings (CAG 17, El Jadida; CAG 24, Addis-Ababa; 3MA, Fez 2007, 3MA, Agadir 2015; AAWG3, 2009; ICG1, 2019...).

During the CAG27 in Aveiro, Portugal, we have proposed and discussed a special issue of the Journal of African Earth Sciences for the CAG28 in Fez. Prof. Damien Delvaux, Editor-in-Chief of JAES has readily accepted this proposal.

“The growth of African Continental Crust through geological times. African Cratons and their margins.”

CAG participants interested in publishing their work in JAES should prepare their manuscripts to be submitted no later than October 2020, during the CAG28, in order to begin review procedures right after the meeting.

Please refer to the JEAS guidelines for authors. <https://www.elsevier.com/journals/journal-of-african-earth-sciences/1464-343x/guide-for-authors>

SOCIAL AND CULTURAL PROGRAM

A welcome reception (ice-breaker) is scheduled on the first evening of the colloquium to encourage networking between colleagues from different countries.

The gala dinner will comprise typical Moroccan food, refreshments, and an entertainment by Moroccan and International music. It will be held in a traditional house with typical architecture and decor of Fez historical buildings.

We also plan to organize touristic visits of Fez, Meknes and the Volubilis Roman ruins during two days.

REGISTRATION AND SCHEDULE

- The online indication of interest in participation from now (please see attached form).
- Formal registration as well as abstract submission information and participation of payment fees are scheduled from March 1st to June 22th 2020.
- Colloquium registration fees, as well as those related to the proposed courses, workshops, fieldtrips and booths rent will be communicated on October 2019 and indicated in the second circular and in the GSAf and CAG28 websites.
- Abstract acceptance notification (after fees payment): **before July 31st**.
- Final program release on September 15th 2020.

Registration fees will include

- Attendance to conference sessions, poster sessions and booths
- Abstract book (in USB key) and program
- Lunches during the conference
- Morning and afternoon refreshments during programmed breaks

**The Organising committee is working on secure travel and registration grants for students from low-income countries especially from Africa.
Application details will be available on March 1st.**

A strong team is doing its best to provide a rich and fruitful CAG28 sessions for all, with friendly, professional and scientific exchange and communications.

Warmest Greetings and Welcome to Fez

e-mail: cag28fez@gmail.com ; cag28fez@usmba.ac.ma;

Website: <http://www.fsdmfes.ac.ma/CAG28> and <http://gsafr.org/cag28/>

Social Network : https://www.facebook.com/cag28fez/?modal=admin_todo_tour