



Association of Applied Geochemists

www.appliedgeochemists.org

AAG PRESIDENT 2022–2023: JOHN CARRANZA



John is the AAG's new President for the period of 2022–2023. He started his career as an exploration geologist/geochemist (1983–2001) in the Bureau of Mines & Geosciences in the Philippines. He delineated mineralised land through systematic drainage geochemical surveys during his tenure there. Just before obtaining his PhD in 2022 on mineral potential mapping (from TU Delft, The Netherlands), he was employed as a researcher at the

International Institute for Geo-Information Science and Earth Observation, The Netherlands, from 2001 until 2003. Then, he was an assistant professor (GIS Predictive Modelling in Geological/Mineral Exploration) at the University of Twente, The Netherlands, from 2003 to 2012. He was an associate professor (Computational Modeling Applied to Exploration & Mining Geology) at the Economic Geology Research Unit, James Cook University, Queensland, Australia, from January 2013 to January 2016. He was a visiting professor at the State University of Campinas, Brazil, from August 2015 to August 2017. He was a professor of geological sciences at the University of KwaZulu-Natal, South Africa, from September 2017 to December 2021. He is, since January 2022, currently a professor of economic geology at the University of the Free State, South Africa. His fields of expertise are (a) geochemistry for mineral exploration, ore genesis, and geo-environmental studies; (b) spatial mathematics/statistics for predictive modeling of mineral resources; and (c) remote sensing for geological/mineral exploration. He has published a book entitled "Geochemical Anomaly and Mineral Prospectivity Mapping in GIS." He is Editor-in-Chief of the *Natural Resources Research*, Senior Associate Editor of *Geochemistry: Exploration, Environment, Analysis*, and Associate Editor of *Ore Geology Reviews* and the *Journal of Geochemical Exploration*.

AAG VICE PRESIDENT 2022–2023: YULIA UVAROVA



Yulia obtained her BSc in geology from Moscow State University (Russia) in 2001 and her PhD in geology from the University of Manitoba (Canada) in 2008. From 2000 to 2002, she worked at the Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow, Russia as a Research Assistant. From 2003 to 2008, she was a teaching assistant at the University of Manitoba. From 2008 to 2012, Yulia worked at Queens' University,

Canada, in the Queen's Facility for Isotope Research, where her research focused on geochemistry, mineralogy, petrology and genesis of economic mineral deposits, and uranium in particular; the development of new exploration tools to search for U deposits; the behaviour of HFSEs in high-temperature systems; and the geochemistry of non-traditional isotopic systems and application of these systems to elucidate processes responsible for deposit formation. Yulia holds a Research Scientist position at CSIRO Mineral Resources, Perth, and works in a team of researchers developing new workflows and techniques for mapping the distal footprints of metalliferous mineral systems through drilling and sampling and developing the science to understand large geochemical footprints of mineral systems and their detection on the surface.

NEW AAG REGIONAL COUNCILLOR FOR NORTHERN AFRICA: SILAS SUNDAY DADA



Born on Sunday, November 9, 1947 in Nigeria, Silas Sunday Dada commenced his education at the SIM Central Primary School in 1954 and proceeded to the SIM Titcombe College, Egbe in 1963 where he obtained his West African School Certificate (Grade 1) in 1967 and his Higher School Certificate (HSC) in 1969. He taught at the Playfair Memorial College, Oro-Ago, Nigeria in 1970 before proceeding to the University of Ibadan, Nigeria where he

graduated in 1973 with a Second Class (Upper Division) in geology. Silas Sunday Dada is a professor of applied geology and the pioneer Pro-Chancellor and Chairman of the Governing Council of Anchor University, Ayobo, Lagos, former President of the Nigerian Mining & Geosciences Society (NMGS, 2017–2019), a former Provost of the College of Pure and Applied Sciences (January 2015–February 2017) at Kwara State University, Malete, Nigeria near Ilorin; pioneer Dean of College of Natural and Applied Sciences and former Deputy Vice Chancellor of Salem University, Lokoja, Nigeria (2009–2012). He was appointed to these positions given his over 40 years of professional contributions including outstanding field and laboratory practice in mineral exploration, teaching, research, consultancy services, and a strong background of high-level exposure and training in applied sciences, curriculum development, and administration. While in the services of the Nigerian Mining Corporation, Jos, he obtained an MSc in applied geology (mineral exploration option) in 1979 from the then University of Ife, Ile-Ife (Nigeria). He proceeded to France in 1984 where he obtained a Diplôme d'étude Approfondie (DEA) in petrology-geochemistry-structural geology and a PhD in isotope geochemistry and geochronology from the University of Science and Technology, Montpellier (France). Prior to 1984, he was involved in petroleum and later mineral exploration (clays, uranium, gold, lead/zinc, tin, tantalite, etc.), covering practically all states of Nigeria. From his post-doctoral research at the University of Paris (1990–1991) to his return to Nigeria, Professor Dada successfully developed and taught several geology courses at all levels. He has initiated research projects and established collaborative research teams across several institutions, and has supervised several researchers and students in NAGAMS (later NMGS) and NAPE as a member of the NAPE-UAP Committee. His research output includes over 65 publications in learned journals and books in addition to several technical reports, conference papers, and seminar presentations, including award-winning research presentations on the Precambrian evolution of the Nigerian continental crust. He has travelled widely, visiting TOTAL operations and top universities offering high-level research in the geosciences in France with a focus on recent developments, roles, and possible collaborations with African universities. He is currently in collaboration with the University of Science and Technology (USTL), Montpellier (France), looking into the commencement of the plate tectonic model through the use of primitive early (Archaean) rocks, including those from Nigeria, by the application of the U-Pb and Lu-Hf radiogenic isotopes. He is a Fellow of several geoscience associations and societies, including the Association of Applied Geochemists.



RECENT ARTICLE PUBLISHED IN EXPLORE

The following abstract is for an article that appeared in issue 193 (December 2021) of the *EXPLORE* Newsletter.

“Breathing New Life into Old Assay Data Using Machine Learning Methods”

Tom Meuzelaar¹, Morgan Warren¹, Alice Alex¹, Pablo Núñez Fernández²

Significant under- or over-estimation of assay parameters can occur when incorrect laboratory assay methods are used. The cost of re-analysis can be very high when such errors are repeated over the scale of thousands of samples. Machine learning algorithms offer a low-cost alternative to expensive re-analysis; a small subset of samples can be re-analyzed, and an algorithm trained to 1) recognize relationships between the corrected parameter and other assay parameters in the subset, and 2) estimate corrected values for the larger dataset. Machine learning algorithms were applied to 5,580 bedrock samples from the Touro exploration assay dataset to assess whether (corrected) sulfur values can be predicted from the other assay parameters in the dataset. When Atalaya Mining acquired a majority interest in the Touro project, it inherited multiple legacy assay datasets with noticeable inconsistencies in sulfur assay data. Further investigation revealed that the data were acquired using laboratory assay methods insufficient to digest metamorphosed sulfides (predominantly pyrrhotite). Machine learning algorithms trained on a dataset with correct sulfur data were able to derive a relationship between other assay variables which enabled reproducing the sulfur concentrations with 93% accuracy. Predictive success is largely a function of 1) the number of samples, 2) the number of assay parameters, and 3) material/deposit geochemistry. Multi-element geochemistry can be used to predict many other things using the machine learning approach. The authors and others have used the approach successfully to predict lithology, alteration, material density, long-term environmental behavior, ore grade, metallurgical characteristics, ore vectors and more.

1 Life Cycle Geo, LLC., 729 Main Street, Longmont, CO, USA 80501

2 Cobre San Rafael SL, B70491121, La Mina, S/N 15822, Touro (San Xoán), La Coruña, Spain

The full articles can be viewed at: <https://www.appliedgeochemists.org/index.php/publications/explore-newsletter>.

THE 1st WEBINAR OF THE SPANISH MINERALOGICAL SOCIETY (SEM)

Organized by the Spanish Mineralogical Society (SEM), the first webinar “Discovering the world of ore deposits” was held every Friday at 17:00 from 22 April to 3 June 2022 as an on-line event. This conference tour held by the most prominent early career Spanish geoscientists targeted a non-specialized audience, as well as secondary school teachers and high school and undergraduate students, with a broad interest in the field of geological science, and particular in the world of ore deposits.

The program included five sessions: 1) Mineral Deposits in Current and Future Societal Challenges; 2) Deposits of Critical Metals; 3) Precious Metal and Diamonds Deposits; 4) Base Metal Deposits; and 5) Future Mining. The sessions are available on the SEM's Youtube channel (<https://www.youtube.com/channel/UCbEDhZdyA9KichLvTr6P1jg>). The given talks were

- **“Mineral deposits: what, how, where, when and why”** by Dr. Lorena Ortega Menor (Universidad Complutense de Madrid)
- **“Minerals for the current and future of the energy transition”** by Dr. Joaquín Antonio Proenza (Universitat de Barcelona)
- **“Chromium: a messenger from the Earth's mantle”** by Dr. José María González Jiménez (Instituto Andaluz de Ciencias de la Tierra)
- **“Germanium, gallium, and indium in the Andes?”** by Dr. Lisard Torró Abad (Pontificia Universidad Católica de Perú)
- **“Rare Earth Elements: the vitamins for the world's engine”** by Dr. Marc Campeny Crego (Museu Natural de Ciències de Barcelona)
- **“What is coltan?”** by Dr. Sandra Amores Casals (Universitat de Barcelona)
- **“Andalusian gold: an active resource from prehistory to the present day”** by Dr. Lola Yesares Ortiz (Universidad Complutense de Madrid)
- **“Where is the silver? Let's look at the volcanoes”** by Dr. Darío Chinchilla Benavides (Instituto Geológico y Minero de España)
- **“Platinum: history, origin, and deposits”** by Dr. Rubén Piña García, (Universidad Complutense de Madrid)
- **“Diamonds”** by Dr. Núria Pujol Solà (Universidad de Granada)
- **“Where does copper come from?”** by Dr. Isaac Corral Calleja (Universitat Autònoma de Barcelona)
- **“Aluminum, nickel, and cobalt in tropical climates”** by Dr. Cristina Villanova de Benavente (Universitat de Barcelona)
- **“Is lithium the new oil?”** by Dr. Teresa Llorens Gonzàles (Instituto Geológico y Minero de España)
- **“Urban mining: reality or legend?”** by Dr. Dídac Navarro Ciurana, University of Barcelona (Universitat de Barcelona; Universitat Autònoma de Barcelona)

SEM 2022

1st WEBINAR

22 April – 03 June



TOP: (LEFT TO RIGHT): Lorena Ortega Menor, Joaquín Antonio Proenza, José María González Jiménez, and Lisard Torró Abad. **MIDDLE: (LEFT TO RIGHT):** Marc Campeny Crego, Sandra Amores Casals, Lola Yesares Ortiz, Darío Chinchilla Benavides, and Rubén Piña García. **BOTTOM: (LEFT TO RIGHT):** Núria Pujol Solà, Isaac Corral Calleja, Cristina Villanova de Benavente, Teresa Llorens González, and Dídac Navarro Ciurana.

**José María González Jiménez
and Dídac Navarro Ciurana**
Organizing and SEM council members