

Meet the Authors



Mark Bediako is a Senior Research Scientist and currently the Head of the Advanced Material Science Division at the CSIR-Building and Road Research Institute in Ghana, West Africa. He combines the fields of chemical and material science and engineering to investigate cementitious and non-cementitious materials for the construction industry. His research currently focuses on supplementary cementitious materials, concrete durability and sustainability, earth materials for buildings, and geopolymers. The goal of his research is to provide economic and ecological sustainability in terms of the selection of construction materials for the built environment, especially in Sub-Saharan Africa.



Maarten A.T.M Broekmans received his MSc and PhD from Utrecht University in The Netherlands. From 1992 to 1997, he worked at a Dutch engineering consultancy where he introduced fluorescence microscopy on plane and thin sections of alkali-silica reaction (ASR)-damaged concrete. Since 1997, Maarten has been working at the Geological Survey of Norway (NGU), currently as

the chief responsible for the scanning electron microscope (SEM) lab. He initiated *Reviews in Mineralogy & Geochemistry* volume 74 on the applied mineralogy of cement and concrete and contributed to the RILEM international guidelines for the assessment of aggregate materials for concrete. His current research interests include the susceptibility of quartz in aggregate for deleterious ASR and SEM characterization of fine-particle fractions from fault gouges for KAr dating on illite, among others. He has taught seminars on “concrete petrography *s.l.*” to civil engineers on four continents, as well as his daughter (at 5 years old) how to operate a petrographic microscope. To the growing horror of his family, he is also an avid rock and book collector.



Angeles G. De la Torre is a chemist that completed her PhD at University of Málaga, Spain in 2003. She became a professor at the same university in the Inorganic Chemistry Department in 2022. Her studies focus on understanding the chemistry of cements, from their production at kilns to their hydration mechanisms. After her postdoctoral position, she focused her research on reducing the

carbon dioxide footprint of cement production. She became the principal investigator on several projects funded by Spanish and regional governments with the objective of optimizing the production and performances of eco-cements based on calcium sulfoaluminate, belite, or limestone-calcined clays. The main goal of her studies has been the establishment of robust methodologies to characterize cements using X-ray diffraction in combination with the Rietveld method.



Jan Elsen is a professor of geology in the Department of Earth and Environmental Sciences at the University of Leuven in Belgium. His research focuses on the mineralogical characterization and use of industrial minerals using quantitative X-ray powder diffraction analysis techniques. His current research topics focus mainly on building materials, clay and cement minerals,

and zeolite deposits with pozzolanic properties. He received his master's degree in geology in 1983 and his PhD in 1988 from the Katholieke Universiteit Leuven, Belgium.



Isabel Fernandes holds an MSc degree in engineering geology and a PhD in geology on the alkali-silica reaction (ASR) and the evaluation of aggregates for concrete. Currently, she is an assistant professor with habilitation at the University of Lisbon, Portugal. In addition to the years that she has been working at the university, she has conducted activities as an engineering geologist, as well

as a manager, for large dams and tunnels for 11 years. She also develops research and development activities with commercial companies in the areas of concrete aggregate characterization and diagnosis of concrete deterioration mechanisms using petrographic methods. Her main areas of interest are petrography applied to building materials (aggregates and concrete) and the durability of building materials (alkali-aggregate reaction, sulfate attack, and acid attack).



Ola Fredin is a professor in engineering geology of Quaternary deposits in the Department of Geoscience and Petroleum, Norwegian University of Science and Technology (NTNU), Trondheim, Norway. He was previously at the Geological Survey of Norway (Trondheim, Norway) and received his PhD at Stockholm University, Sweden. He studies

Quaternary landforms and deposits to elucidate the mode and tempo of ice sheet dynamics over Quaternary time scales. His work is mostly focused on Northern Hemisphere glaciations, but he has also worked in Antarctica. His study methods include in-situ cosmogenic isotopes and detailed studies of deposits through microscopy, X-ray fluorescence, X-ray diffraction analysis, and other analytical methods.



Theodore Hanein is a chemist/chemical process engineer and a UKRI Future Leaders Fellow working on “*Green, Circular, and Smart Cement Manufacture*” in the Materials Department at the University of Sheffield, England. He completed his PhD in 2016 at the University of Aberdeen, Scotland, where he specialized in calcium sulfoaluminate cement technology and clinker thermodynamics.



Marie Jackson is a research associate professor in the Department of Geology and Geophysics at the University of Utah, USA. She investigates the material and mineralogical characteristics of ancient Roman architectural and marine concretes, as well as young basaltic analogs at the Surtsey Volcano (Iceland), to understand

cementing processes in volcanic tephra systems in diverse chemical environments. Synchrotron X-ray microdiffraction (μ XRD) analyses coupled with various spectroscopic analyses can describe these processes at the micrometer-scale. She also explores self-sustaining cementitious systems in experimental reproductions of Roman concretes with reactive glass aggregates.



Annina Margreth is a researcher in the Section for Social Geology at the Geological Survey of Norway located in Trondheim. She studied geosciences at ETH Zürich (Switzerland) and worked a couple of years as a consultant geologist in Switzerland, where she gained experience as a site geologist on a large tunnel construction site. During her doctoral studies at Dalhousie University in Halifax, Canada,

she applied cosmogenic nuclide dating to understand the glacial history and landscape evolution of the Canadian Arctic. She now combines her interest in applied geosciences, working with the Norwegian national

database for gravel and hard rock aggregate resources, with her scientific curiosity studying the development and change of the Scandinavian landscape as a result of glacial and weathering processes.



Kathryn Moore is a geologist who participates in and supervises research relating to ore-hosting geological systems, and whole-system solutions to secure supplies of critical raw materials. At the Camborne School of Mines (UK), she has co-developed transdisciplinary, low-footprint solutions for extraction using small-scale, modular and mobile technologies, for critical raw materials, bulk metals,

and non-metal raw materials. Her work crucially considers whether current mining paradigms are well-suited to the geological nature of raw materials, the scale of ore deposits, the footprint of supply chains, and environmental and social sustainability imperatives.



Herbert Pöllmann was a professor of mineralogy and geochemistry at Martin-Luther-Universität Halle-Wittenberg, Germany, where he had been Dean of the Faculties of Geosciences and Natural Sciences and Engineering. He sadly passed away before the publication of this issue. He received a PhD from the University of Erlangen, Germany, in 1984, with a thesis on the effects of pollutants and

the formation of new crystals in hydraulic binders. His research activities focused on applied mineralogy and on the crystal chemistry of cement binders, and he edited two books on this subject. He was chairman of the section of applied mineralogy of the German Mineralogical Society and the section of technical crystallography of the German Crystallographic Society.

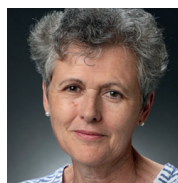


John L. Provis is a professor of cement materials science and engineering at the University of Sheffield (UK), where he has led a team working on cements for sustainable construction and nuclear waste immobilization since 2012. He completed a PhD in chemical engineering at the University of Melbourne (Australia) in 2006, and works mainly on alkali-activated cements and other low-carbon

cementitious binder systems using combinations of experimental and modeling approaches. He still classifies himself as a materials chemist, despite spending increasing amounts of time working with civil engineers figuring out how to make and use concretes more efficiently.



Encarnación Ruiz-Agudo is an assistant professor in the Department of Mineralogy and Petrology at the University of Granada, Spain. She is a chemical engineer who received her doctorate within the Earth sciences doctorate program. Her research focuses on obtaining a better understanding of the processes of dissolution, growth, and mineral replacement, as well as the effect of organic compounds on these processes, with diverse applications including the protection of ornamental materials used in built heritage, cement industry, biomineralization processes, and CO₂ capture through carbonate mineralization. She carried out pre- and postdoctoral research at internationally renowned centers, including The Getty Conservation Institute (Los Angeles, USA) and the Institute für Mineralogie at the University of Münster (Germany), where she was funded by a Marie Curie postdoctoral contract in the group of Professor Andrew Putnis. Her research has received several awards, including the Arne Richter Award for Outstanding Young Scientists from the European Geosciences Union (2012) and the European Mineralogical Union Research Excellence Medal (2014).



Karen Scrivener has been a professor and Director of the Laboratory of Construction Materials in the Department of Materials of École Polytechnique Federale de Lausanne (EPFL), Switzerland, for the last 20 years. She is a Fellow of the UK Royal Academy of Engineering and an author of over 200 journal papers. Her research focuses on understanding the chemistry and microstructure of

cement-based materials and improving their sustainability. In 2008, she came up with the idea for LC3 cement; this material has the potential to cut CO₂ emissions related to cement by more than 400 million tonnes per year. She received her bachelor's degree in materials science from the University of Cambridge, England, in 1979 and her PhD from Imperial College London, England, in 1984.



Ruben Snellings recently became an associate professor of applied mineralogy at the KU Leuven (Belgium). Before he worked as senior researcher at VITO, the Flemish Institute of Technological Research (Belgium), where he was in charge of the scientific coordination of a wide range of mineral residue upcycling projects. He obtained his PhD in sciences (geology) at KU Leuven (Belgium) in 2011,

and mainly studies sustainable cements and concrete incorporating primary and secondary resources (zeolites, slags, fly ashes, and calcined clays). After his PhD, he joined the Magnel Laboratory for Concrete Research at UGent (Belgium) as a postdoctoral researcher and the Laboratory of Construction Materials of EPFL (Switzerland) as a Marie Curie IEF Fellow. There, he specialized in X-ray diffraction and electron microscopy analysis of cementitious materials. In 2016, he was awarded the RILEM Gustavo Colonnetti Medal for his contribution to construction materials science as a young researcher.



Luca Valentini is an associate professor at the University of Padua, Italy. He holds a PhD in Earth sciences awarded by the University of Galway, Ireland. His expertise and research interests lie at the intersection between applied mineralogy, materials science, and physical chemistry, and he combines experimental and numerical methods to assess the role of small-scale physical and chemical

processes in determining the engineering properties of cement-based materials. He currently collaborates with several institutions based on the African continent concerning the use of calcined clays and other local raw materials for sustainable construction.



Zuhua Zhang is a professor of cementitious materials at Hunan University in China. He particularly focuses on the research and development of low-carbon cement and concrete, as well as geopolymer-related, alkali-activated materials. He has developed several strategic and patented methods of solving the most challenging issues for the application of this type of promising materials, such as reactivity

assessment of raw materials, setting control, shrinkage reduce, and durability improvement. His recent projects are to turn industrial wastes into high-performance, geopolymer-derived products including functional aggregate and marine concrete.