The 21st International Sedimentological Congress (21st ISC)

August 22-26, 2022, Beijing, China

Call for Session Proposals

Share your expertise and experiences in broad fields of sedimentology by submitting a session proposal for the 21st International Sedimentological Congress (21st ISC). The International Association of Sedimentologists (IAS) is sponsoring the quadrennial congress in Beijing, China, on August 22-26, 2022. The 21st ISC is anticipated to attract up to 2,000 attendees from all over the world. The China University of Geosciences (Beijing), in collaboration with the Chinese Association of Sedimentologists (CAS), will generously host this international event.

With the slogan of "A New Journey of Sedimentology: from the Pacific to the Himalaya", the Scientific Committee, working with the Organizing Committee, has proposed 12 Scientific Themes covering various fields of sedimentological theories, and their scientific and social implications. A short outline is also attached for each theme to describe the content, scope, objective, and outcome of the theme.

We seek session proposals addressing all topics of these 12 Themes. A session proposal should include a descriptive title, a primary convenor (name, institution, email address), up to four co-conveners, and brief session outline (maximum 300 words). The session outline includes a clear statement on the session scope, content, goals, and specific requirements and outcomes. Session proposals are preferably submitted online, but we also provide a Session Proposal Format for offline submission.

After submitting the session proposal, the primary proposer will be immediately acknowledged for a receipt of the session proposal. The final acceptance of the session proposals will be notified on November 22, 2021.

The deadline for submission of session proposals is due by November 1, 2021. Please submit it online through: http://isc2022.org.cn/session-proposal-create/. Please send your proposals offline to isc2022@cugb.edu.cn. Enquiries can be emailed to isc2022@cugb.edu.cn.

List of Scientific Themes

Theme 1: Deep-time Climate & Environment

***Coordinators**: Huaichun Wu, China University of Geosciences-Beijing, China, whcgeo@cugb.edu.cn; James Ogg, Purdue University, USA, jogg@purdue.edu*

Outline: Global climate change witnessed an ever-increasing warming in decades, and the amount of carbon dioxide in the atmosphere could soar by the end of the century to a level not seen for recent 34 million years. The understanding of global climate change and its potential effects on ecosystems, resources and habitability should be paid by the prompt attention for facing the current climatic and environmental changes. The near-time paleoclimate studies have developed a refined understanding of the complex dynamics of the Earth's climate system over the past few thousands to hundreds of thousands of years. The pre-Quaternary sedimentary records could also be the key to predicting the future of climate change. The goal of this theme is to congregate the state-of-art advances in all aspects of sedimentology, paleoceanography and paleoclimatology across multiple timescales in marine and terrestrial environments. Within this broad topic, contributions include but are not limited to case studies of sedimentology, paleontology, stratigraphy, organic and inorganic geochemistry, and climate modelling, alongside integrated approaches to understand evolving earth processes, particularly climate transitions and their consequent impacts across climate thresholds from the deep-time records.

Theme 2: Tectonics & Volcano-Sedimentology

***Coordinators:** Peter A. Cawood, Monash University, Australia, peter.cawood@monash.edu; Xiumian Hu, Nanjing University, China, huxm@nju.edu.cn*

Outline: Volcano-sedimentary rock associations occur throughout Earth history and have played a key role in constraining tectonic processes. They provide key spatial and temporal records of the generation and evolution of the continental crust, including processes of crustal generation and reworking. We seek contributions on volcano-sedimentary processes ranging from: sedimentology and facies analysis that operate between source and sink; methodologies for differentiating first cycle and multi-cycle debris; changes in volcano-sedimentary processes through Earth history; and, how the application of isotopic and trace element studies of detrital mineral phases provide insight into the tectonic setting of sink and/or source.

Theme 3: Environmental & Hazard Sedimentology

***Coordinators**: Irina Overeen, University of Colorado-Boulder, USA, xxx; Longyi Shao, China University of Mining and Technology-Beijing, China, shaol@cumtb.edu.cn*

Outline: Environmental sedimentology is an interdisciplinary subject of environmental science and sedimentology, and its ultimate goal is to solve out increasingly prominent, globally concerned environmental problems mediated by unpredictable natural hazards and intense activities of human beings. Environmental sedimentology analyzes the relations between environment and sediments, dealing with major problems of ecology, environment, disasters, and global change from the sedimentological point of view. This theme hopes assemble sessions addressing: natural hazard environmental sedimentology, pollutant environmental sedimentology, ecologically related environmental sedimentology, and global change environmental sedimentology as well as the hidden mechanisms. Any sessions of the above topics are welcome, and this theme also hopes exchange the research results and recent progress on these topics, and promote the studies on environmental and Hazard sedimentology worldwide.

Theme 4: Biological Process in Sedimentation

***Coordinators**: Shucheng Xie, China University of Geosciences-Wuhan, China, xiecug@126.com; Peir Pufahl, Acadia University, Canada, peir.pufahl@acadiau.ca*

Outline: Biotic activities are involved in most, if not all, sedimentation processes throughout the evolutionary history of life on our planet. This theme targets organism (including microbial) involvement in sedimentation throughout Earth's history from the Proterozoic to the present-day with an emphasis on organism-environment interactions during critical periods for the evolution of Earth's life. It also provides a platform for exchange of ideas on biological processes in physical sedimentation throughout the geological past to the present day and their possible consequences and controls. We invite session proposals addressing various aspects of biologically involved sedimentations of (1) microbially mediated and microbially induced sedimentary records and metazoan build-ups in modern-day and ancient sedimentary settings, and (2) (bio)geochemical signals of extreme environment and climate changes during the present-day and deep-time critical transitions. How rapidly ecosystems can adjust to abrupt environmental extreme and climate change is a fundamental question accompanying present-day global warming and environmental stresses. Ultimately, this theme hopes advance global knowledge on biotic involvement in sedimentation during critical life and environmental turning transitions, and will provide strategies to help manage the current global extreme events and subsequent restoration of marine ecosystems.

Theme 5: Continental Siliciclastic Depositional Systems

***Coordinators**: Christopher Fielding, University of Connecticut, USA, christopher.fielding@uconn.edu; Wan Yang, Missouri University of Science and Technology, USA, yangwa@mst.edu*

Outline: Terrestrial siliciclastic sedimentary deposits contain a myriad of lithologic, geochemical, and geophysical signals of the tectonic, climatic, and biologic conditions in a

variety of environments and ecosystems on land in the Earth's past. They are also important host rocks of natural resources of water, energy, and ore minerals. However, intrinsic properties of terrestrial sedimentary, tectonic, climatic, and ecological systems present great challenges to our studies of ancient records due to the frequent changes in terrestrial environments and the physical, chemical, and biological conditions localized in various catchment basins. Rapid alternations among depositional, non-depositional, and erosional events affect sedimentation and result in highly incomplete stratigraphic records, which prevent reliable high-resolution lithostratigraphic correlation over a distance of 0.1–1 km. We invite proposals from fellow sedimentologists for sessions on all aspects of terrestrial siliciclastic depositional systems, including new proxies, methods, and facies models, source-to-sink relationships, interpretations of the mechanisms, processes, and controlling factors of sediment production, transport, deposition, and burial diagenesis of modern and ancient records in various tectonic and climatic settings, and case studies on the exploration of natural resources in terrestrial siliciclastic depositional systems. Any sessions on the study of sedimentary records on the other terrestrial planets are also welcome.

Theme 6: Marine Siliciclastic Depositional Systems

***Coordinators**: Francisco J. Hernández-Molina, Royal Holloway University of London, UK, javier.hernandez-molina@rhul.ac.uk; Zhifei Liu, Tongji University, China, lzhifei@tongji.edu.cn*

Outline: In the last decades, our knowledge and understanding of marine depositional systems have grown very fast. Both scientific, economic, and environmental efforts have increased exploration and research on marine sedimentation in modern and ancient marine basins (now exposed on land), specially into the deep ocean, documenting significant advances in understanding of these systems. The siliciclastic depositional systems record the interface between land and sea in coastal and shelfal regimes and the transport and sedimentation through slope to deep-basin domains, and their responses to a variety of forcing mechanisms: physical process, internal dynamics, relative/actual sea level, sediment flux, tectonic activity, and climate change. These systems have long been the subject of various marine sedimentary processes: fluvial sediment input, coastal erosion, estuary and delta development, shelf-to-slope transport, slope slide/slump debris-flow process, turbidity current activity, bottom currents and their secondary associated oceanographic processes, and other hemipelagic and siliciclastic pelagic processes. In addition, the siliciclastic depositional systems may be mixed with carbonate sedimentation when certain tectonic and/or climatic affects occur.

New models are being proposed and there is a growing interest in these systems, in their origins, their deposits and evolution, their relationship with deep-sea ecosystems, geological hazard, and even their economic potential in energy geosciences, carbon capture and storage (CCS) and mineral resources. Combined efforts of researchers, industry partners, and policy-makers can help advance understanding and responsible stewardship of marine systems. This Theme 6 seeks to discuss about the latest research progresses and discusses future perspectives in the marine siliciclastic depositional systems. You are cordially invited

to participate in this exciting Theme during the 21st ISC and we aim to provide a scientifically stimulating and socially enjoyable forum to meet and discuss results and ideas related to those systems. New perspectives in marine sedimentation and their integration in current models (e.g., source to sink, synchronous and asynchronous interaction, of processes, etc.) will be discussed on this Theme 6, which should be of interest to both academic and industry participants.

Theme 7: Carbonate Sedimentation

***Coordinators**: Zhong-Qiang Chen, China University of Geosciences (Wuhan), China, zhong.qiang.chen@cug.edu.cn; Hairuo Qing, The University of Regina, Canada, hairuo.qing@uregina.ca*

Outline: Carbonate rock/sediment is one of the commonest sedimentary products in our planet and is also one of the most important components of the Archean-Cenozoic stratigraphic successions. Carbonates are widespread in a variety of environments in the present-day and geological past marine and lacustrine depositional systems. Carbonate sedimentation represents precipitation of carbonate sediments during chemical or biological processes, reflecting precipitating mechanisms of chemical or biological carbonate factory. Carbonates usually record excellent geochemical signals of original seawater and lake-water, and thus are important proxies, through elemental and isotopic analyses, unravelling ocean/lake-atmospheric cycles of various elements (carbon, sulfur etc.) that are closely related to climatic, redox, and weathering variations in the geologic past. They are also important host rocks of natural resources of energy, and ore minerals. Microbial carbonates (including microbialites) record the oldest life forms of Earth, and they therefore are important proxies exploring the origin of life in our planet. In addition, dolomite is another common type of carbonates and it is generally believed to be mediated by microbes, but other genetic mechanisms are hard to be ruled out. Genesis of dolomites therefore has long be hotly debated. Increasing evidence shows that dolomite and microbialite both functioning as source rocks and reservoirs are important for conventional and unconventional hydrocarbon explorations. Accordingly, this Theme provides a forum for the exchanges of ideas on all aspects of carbonate (including evaporate) geology, and assembles sessions addressing all aspects of carbonate depositional systems, including precipitation process, methods, and facies models, biosedimentology, biogeochemical process, interpretations of the mechanisms, processes, and controlling factors of sediment precipitation, and burial diagenesis of modern and ancient records in various depositional and climatic settings. Any sessions on the above topics of carbonate sedimentation are welcome.

Theme 8: Modern Sedimentary Process

***Coordinators**: Shu Gao, East China Normal University, China, sgao@sklec.ecnu.edu.cn; Peter Talling, Durham University, UK, peter.j.talling@durham.ac.uk*

Outline: An improved understanding of modern sedimentary processes, in terms of the

characteristics of sedimentary environments, influencing factors, controlling mechanisms and system evolution patterns, is important for the society. Furthermore, it provides vital information for the interpretation of the geological history: if the stratigraphic features differ from what is observed in the modern environment, new processes should be sought. The modern processes can be associated with sand or mud deposits, as well as carbonate deposits. They can also be related to the shallow marine, i.e., estuaries, river deltas, coastal and shelf waters, or deep oceans, i.e., continental slope, submarine canyon, ocean bottom, trench and mid-ocean ridge environments. With regard to the dynamics of modern sedimentary systems, the roles played by waves, tides, shelf and deep ocean circulations, and sediment gravity flows are critical to the formation of the various estuarine and coastal deposits, deep sea fans adjacent to the continental margin, and contourites. Biological processes generate reefs and carbonate systems. Furthermore, regime shifts in modern processes occur in response to the present-day climate change and anthropogenic forcing. The relevant progress in these studies and the new scientific problems identified will be reported in Theme 8.

Theme 9: Basin Analysis & Numerical Modeling

***Coordinators**: Benjamin Kneller, University of Aberdeen, UK, b.kneller@abdn.ac.uk; Xiaomin Zhu, China University of Petroleum-Beijing, China, xmzhu@cup.edu.cn*

Outline: As one of the most basic tectonic units on the earth's surface, sedimentary basins not only record the history of the lithosphere dynamics and plate interaction, but also contain energy and other mineral resources indispensable to human beings. Basin analysis is one of the most important approaches studying depositional history of sedimentary basin and interplays between sedimentology and tectonics/volcanisms. As a hotspot, basin analysis has been attracting increasing attentions from broad geoscience communities, and it enables to systematically analyze the tectonic settings and dynamic mechanisms of basin formation, to identify tectonic evolutionary history, burial history of sediments, and filling and thermal histories of the basins, to establish the evolution model of basins, and to conduct comprehensive research on geodynamics. Recent development of some disciplines related to basin analysis and the continuous exploitation of mineral resources have highly promoted the process of sedimentary basin analysis. The comprehensive study of this field has achieved fruitful results in the dynamics of sedimentary basins, the relationship between the spatial and temporal distribution of basins with plate tectonics, numerical simulation of basins, reconstruction of the sedimentary basin evolution process, and evaluation of the hydrocarbon prospects of sedimentary basins. Therefore, all professionals who are interested in this topic will be sincerely welcomed to discuss the developments and future perspectives of basin analysis and numerical modeling within this theme.

Theme 10: Resource Sedimentology

***Coordinators**: Rukai Zhu, Research Institute of Petroleum Exploration and Development, China, zrk@petrochina.com.cn; Joydip Mukhopadhyay, Presidency University, India, joydip17@gmail.com*

Outline: Energy industry is one of the most important drivers for the development of sedimentology. The top two resources fitting our demands on energy are petroleum and coal, which promote the studies of petroleum geology and coal geology. Within this theme, resource sedimentology gives birth to many sub-disciplines, including black rock system sedimentology, deep reservoir geology (depth 4500 m), unconventional tight reservoir geology, and global carbon cycle management. All these topics are closely related to both the petroleum and coal industry, and the earth system. Within these broad topics, current researches are focused on the depositional process of fine-grained sediments and coal, and the origin for organic-matter accumulation, the construction of a more predictive organic facies and coal facies model, the characterization and evolution of pore-fractures system in different rocks, and the hydrocarbon occurrence and the sweet-spotting of unconventional resources. Moreover, the formation of resources is carbon burial, while the resource exploitation is the release of carbon, which is the important component for global carbon cycle. This theme aims to demonstrate the latest processes of sedimentology on the coal system, conventional and unconventional petroleum system, and global carbon cycle. The relationship between resource utilization and sedimentology development is also encouraged to discuss in various sessions within this theme.

Theme 11: Sedimentary Geochemistry

***Coordinators**: Peter K. Swart, University of Miami, USA, pswart@rsmas.miami.edu; Bing Shen, Peking University, China, bingshen@pku.edu.cn*

Outline: Unraveling the history of habitable planet Earth relies on the precise extraction of paleoenvironmental information from sedimentary rocks, whose geochemical compositions were co-controlled by sedimentation and diagenesis. The goal of Sedimentary Geochemistry is to understand what controls the geochemical compositions of sedimentary rocks, and to apply various geochemical proxies in the study of Earth's history. Here, we call for technique sessions focusing on every aspect of *Sedimentary Geochemistry*, including but not limited to, the geochemical processes in sedimentation and diagenesis of various sedimentary rocks, e.g., carbonate, cherts, ironstones et al., the development and progress of novel geochemical approaches (systematics of traditional and non-traditional isotopes, such as C, S, O, Mg, Ca, Si et al, and elements, such as Fe and P speciation), and the applications of geochemical approaches in the study of Earth history.

Theme 12: Geoscience Programs & New Technology on Sedimentology

***Coordinators**: Gilbert Camoin, CEREGE, Aix-en-Provence, France, camoin@cerege.fr; Jingping Xu, Southern University of Science and Technology, China, xujp@sustech.edu.cn*

Outline: Historically, large (scientific scope, geographical area, operational budget, number of participants, etc.) geoscience programs or expeditions such as IODP, ICDP, MARGINS, or e.g., the Qinghai-Tibet Plateau Expedition incrementally advances, or sometimes revolutionizes the world's understanding of Earth Sciences in general and that of

sedimentology in particular. In addition to large budgets and brilliant minds involved in these programs, the use of creative and new technologies is one of the critical factors that propel breakthroughs and discoveries. As suggested by the above title, this theme invite session proposals that: (1) focus on a specific geoscience program from all corners of the world that investigates a variety of sedimentological issues including, but not limited to, fluvial, lacustrine, marine sedimentological processes and deposits (modern or ancient); and/or (2) showcase technological breakthroughs (e.g., sampling devices, analyzing methods, numerical modeling and schemes, etc.) that advance sedimentological research both qualitatively and quantitatively.

Session Proposal format

Record ID#: a number generated from the submission system

Title: a descriptive title

Primary Convener: full name, institution, state/city, country; email address

Co-Convener #1: full name, institution, state/city, country; email address

Co-Convener #2: full name, institution, state/city, country; email address

…… (maximum 4 co-conveners)

Theme #: select one from a list of 12 themes

Session Description (maximum 300 words): describe the scope, content, goals, and specific requirements of the session.