"DEEP-2024" Second Circular

(May 8, 2024)

The Organizing and Scientific Programme Committees of the International Symposium on Deep Earth Exploration and Practices (DEEP-2024) are honoured to invite you to participate in:

International Symposium on Deep Earth Exploration and Practices from 22 to 24 October, 2024 in Beijing, China

The updated information is on http://deep2024.sinoprobe.org.

HOSTS

China Geological Survey of the Ministry of Natural Resources of China

National Natural Science Foundation of China

INITIAL SPONSORS

SinoProbe Laboratory, Chinese Academy of Geological Sciences (SinoProbe Lab.)

International Union of Geological Sciences

International Lithosphere Program

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BACKGROUND

Deep Earth exploration is a multi-disciplinary, complex undertaking aimed at understanding the structure, dynamics and evolution of the continents and their margins. Interactions between Earth's tectonic plates produced the continents and oceans that characterise our planet while creating the mineral resources that support our standard of living. Active tectonic processes are also responsible for devastating hazards such as earthquakes and volcanic eruptions, and control Earth's surface topography which fundamentally affects the climate, environment, and our modern life. Therefore, it is of common interest to society worldwide to study the interior of the Earth and to gain fundamental insights into how our planet operates.

What is SinoProbe

SinoProbe is funded by the Chinese Government for Earth exploration with unprecedented scope and ambition. The overall aim of SinoProbe is to take a multi-disciplinary approach in studying the composition, structure, and evolution of the continental lithosphere of China. SinoProbe-I, the initial phase of SinoProbe, was launched in 2008 and was successfully completed in 2016. This was followed by DREAM (Deep Resources Exploration and Advanced Mining) from 2016-2021 and Deep Geological Survey from 2016. The achievement of the past years has outlined a wide range of exciting scientific research directions and defined new questions to be addressed by SinoProbe-II. SinoProbe-II will focus on the bottleneck of deep earth exploration technology, develop an Aeronautical-Surface-Interior exploration technology and equipment system. To enable geoscientists to reach the deeper interior of the Earth. It will conduct deep structure and deep material exploration along key zones across China and in its adjacent areas, including acquisition of 20,000km of seismic reflection profiles, high density broad-band seismological data with a 30x30km station density, and MT data at 1°x1°, as well as super-deep scientific drilling and observations. SinoProbe-II will accumulate a huge number of valuable data about the deep Earth, and through wide data exchange, up-to-date computer and AI technologies will benefit geosciences and related disciplines, education, and international cooperative research. SinoProbe-II will also co-initiate the Global Probe project, "Earth CT", with prominent organizations including ILP, IUGS, IUGG, ICDP, GFZ and universities and institutes from a large number of

countries.

What is the DEEP -2024

After the successful 2011 ISDEL，DEEP-2018 and DEEP-2021 meetings, that were attended by hundreds of geophysicists and geologists from the USA, Canada, Brazil, Russia, Australia, Japan, Germany, Italy, Spain, Sweden, Denmark, Turkey, Poland, UK, Ireland, South Africa, India, Singapore, etc., as well as China, DEEP-2024 is continuing more open and cooperation for global geo-community with the international family of attendees included principal and co-principal investigators of international deep exploration programmes, such as COCORP and EarthScope of the United States, LithoProbe and CCArray of Canada, AGCRC of Australia, and EuroProbe, TopoEurope, and AlpArray of Europe.

Taking the opportunity of DEEP-2024, SinoProbe-II will host the launching ceremony with global partners. SinoProbe-II is looking for close international collaboration through the DEEP-2024 platform with SinoProbe Lab. Talent Boost Program, aiming for integration of exploration and research of critical geological study areas worldwide, and contributing to the international sharing of exploration data and results, with the overall objective of enhancing our knowledge of the Earth and its mineral resources.

ORGANIZING COMMITTEE

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SCIENTIFIC PROGRAMME

Theme

The theme of DEEP-2024 is " Wide Open Collaboration".

Sessions Overview

Session 1 Quo Vadis? Critical unexplored regions of Earth

Co-Conveners: BROWN, Larry (Cornell University, USA), DONG Shuwen (SinoProbe Lab. and Nanjing University, China), ZHU Rixiang (Institute of Geology and Geophysics, CAS, China), ASSUMPCAO Marcelo (University of São Paulo, Brazil), EBINGER Cindy（Tulane University, USA）, THYBO Hans (ILP), HOU Zengqian (SinoProbe Lab., China), DURRHEIM Raymond (University of the Witwatersrand, South Africa)

Quo Vadis (trans. “Where are we going?”)

Description: The Earth CT international cooperation program originates from initial discussions during the International Symposium, DEEP-2018. Deep Earth processes control geological evolution, including the formation of natural resources, natural disasters, and large-scale environmental changes at the surface of the Earth. The Earth CT program aims to globally construct long profiles in wide corridors to image the lithosphere by integrative interpretation of geoscientific data. This session welcomes researchers from all over the world to share their research achievements in the field of deep lithospheric studies using integrative techniques including deep seismic reflection and refraction profiling, broadband seismic observations, magnetotelluric sounding (MT) and so on. The aims of the CT program are to reveal the deep structure of the lithosphere, recognize the deep processes of plate movement and their control and influence on the surface system, explore energy and mineral resources at depth, and provide insight into geoscience frontier issues, such as the mechanisms controlling natural disasters and their intrinsic dynamics. Informed by such studies of existing results, we also seek to stimulate future lithospheric research by a discussion of critical tectonic zones that have not yet been probed by modern deep exploration techniques. We hope that this discussion will facilitate new initiatives such as the global deep exploration cooperation (Earth CT) program.

Session 2 Deep structure and dynamics of Himalaya-Tibet

Co-Conveners: KLEMPERER Simon (Stanford University, USA), DING Lin (Institute of Tibetan Plateau Research, CAS, China), YUAN Xiaohui (GFZ German Research Center for Geosciences, Germany)，LU Zhanwu (SinoProbe Lab. and Institute of Geology, CAGS, China), GUO Xiaoyu (Sun Yat-Sen University, China), GHOSH Attreyee (Indian Institute of Science, India), LI Zhong-Hai (University of Chinese Academy of Sciences, China)

Description: Understanding the geodynamics of the Himalaya and Tibetan Plateau provides crucial insights into global tectonic processes, mountain building mechanisms, and associated natural hazards. Recently, a wealth of deep exploration and geodynamic studies of the Himalaya-Tibetan orogen have been conducted to decipher the underlying mechanisms of the continental collision and orogeny. Surface processes, such as erosion, sedimentation and climate dynamics, in turn influence the tectonic evolution of the Himalaya–Tibetan plateau. This session focuses on the studies of the deep processes and geodynamics that shape this vast orogen, as well as the studies concerning the complex interactions between tectonics and surface processes. We invite submissions aimed at documenting and understanding the collisional tectonics, lithospheric geometry and mass balance of the Himalaya-Tibetan Plateau, using any geophysical, geochemical, geochronological or geological datasets, and/or geodynamic modelling, with the aim of elucidating the 4D evolution of this continental collision.

Session 3 Deep structure and evolution of Eurasia

Co-Conveners: XIAO Wenjiao (Xinjiang Institute of Ecology and Geography, CAS, China), SCHULMANN Karel (Czech Geological Survey), ZHAO Liang (Institute of Geology and Geophysics, CAS, China), MOONEY, Walter D. (U.S. Geological Survey, USA), CARBONELL Ramon (CSIC-Inst. Earth Sciences, Spain), CHEN Xuanhua (SinoProbe Lab., China)

Description: Eurasia is the largest and most geologically diverse land mass on Earth, composed of several representative orogens including the Altaids, Caledonides, Hercynides, Tethysides and Uralides. More than five decades of exploration has probed their deep structure, including a variety of geologic, geochemical and geophysical methods, including active and

passive seismic studies as well as non-seismic methods. This session welcomes contributions that report new insights into the deep structure of Eurasian orogens. Results that are multi-disciplinary and that combine multiple data sets are welcomed.

Session 4 Dynamics of intracontinental deformation

Co-Conveners: GERYA Taras（ETH, Zurich), ZHANG Junfeng (University of Geosciences, Wuhan, China), CHEN Ling (Institute of Geology and Geophysics, CAS, China), WANG Qin (Nanjing University, China), LI Jianhua (SinoProbe Lab. and Institute of Geomechanics, CAGS, China)

Description: This interdisciplinary session invites contributions from disciplines in geophysics, geodynamics, structural geology and geochemistry that focus on the structure and evolution of the continental lithosphere and on geodynamic processes within the continental interior. The session will present overviews of current knowledge on the structure of the crust and the upper mantle in different tectonic settings, ranging from Precambrian cratons to sedimentary basins, continental rift zones, and intracontinental collisional orogens. Geodynamic studies will demonstrate the role of various processes in intracontinental deformation, ranging from collisional, extensional and strike-slip deformation by plate tectonics, to intracontinental deformation caused by lithosphere-mantle dynamic interaction associated with hotspots, large igneous provinces and large-scale impacts.

Session 5 Cratons and their margins

Co-Conveners: YUAN Huaiyu (Geological Survey of Western Australia, Perth, Australia), GESSNER Klaus (Geological Survey of Western Australia, Perth, Australia), ZHANG Shuanhong (SinoProbe Lab. and Institute of Geomechanics, CAGS, China), and LEVIN Vadim (Center for Earthquake Research and Information, University of Memphis, Memphis, USA)

Description: The interior of continents, especially the stable Precambrian cratons and their margins, preserve a rich tectonic record detailing the formation, reworking, and potential destruction of continental crust and lithosphere. Recent advances in geophysical imaging have provided novel insights into the tectonic history and evolutionary trajectories of Precambrian cratons. In this session, we invite contributions from studies utilizing passive-source, active-source seismic, and other geophysical

techniques, emphasizing research into the structural evolution and compositional properties of these ancient continental cores.

Session 6 Crust-mantle interaction

Co-Conveners: XU Yigang (Guangzhou Institute of Geochemistry, CAS, China), YANG Jingsui (Institute of Geology, CAGS and Nanjing University, China), GAZEL Esteban (Cornell University, USA), ZHENG Jianping (China University of Geosciences, Wuhan, China), CHEN Lihui (Northwest University, Xi' an, China), GRIFFIN William (Macquarie University, Australia)

Description: Melting of the mantle transports materials from depth to the Earth's surface and builds the crust. Conversely, crustal material returns to the mantle through subduction, erosion and/or delamination. Such a cycling process plays a key role in the habitability of our planet. The recycling of crustal materials, including volatiles, not only affects the net growth of the crust, but also modifies the composition and the physical property of the mantle. In recent decades, crustal growth, crustal recycling processes and the fate of recycled crust have been investigated through petrological/geochemical observations of natural rocks, e.g. oceanic/continental basalts, mantle xenoliths/xenocrysts, ophiolitic mantle rocks, orogenic peridotites, ultra-high pressure metamorphic rocks, diamonds and their inclusions, and also through high-pressure experiments and geodynamic modelling. Recent progress on the above topics is welcome in this session.

Session 7 Surface processes in response to deep earth dynamics

Co-Conveners: LIU Jing (Tianjin University, China), KLINGER Yann (IPGP, France), LI Haibin (SinoProbe Lab. and Institute of Geology, CAGS, China), BRAUN Jean (GFZ, Germany), HUNTINGTON Kate (University of Washington, USA), ZHANG Huiping (Institute of Geology, CEA)

Description: Interactions between geological and surface processes and deep earth dynamics are increasingly recognized at various scales over the past decades. This ongoing research has profound implications for predicting natural hazards, interpreting sedimentary archives, and modelling global geochemical cycles. Earth surface processes operate at the intersection of tectonics, climate, and biology, making them inherently multifaceted and complex to study. Recent advances in geo/thermochronology, numerical methods, and remote sensing continue

to improve our ability to measure landscape dynamics and explore the complicated interplay between various earth systems across an increasing range of spatial and temporal scales. Improved techniques used in novel combinations facilitates interrogating geologic processes that differ across landscapes and timescales. In this session, we welcome studies that combine analytical techniques and new approaches to investigate diverse terrestrial processes (e.g. mountain building, erosion, landscape development, weathering, soil development, ecosystem shifts) across disparate spatial or temporal domains, and attempt to explore the potential linkage with deep earth dynamics.

Session 8 Lithospheric architecture, deep earth material probing, and metallogenesis

Co-Conveners: WANG Tao (SinoProbe Lab. and Institute of Geology, CAGS, China), HOU Zengqian (SinoProbe Lab., China), SELTMANN, Reimar (The Natural History Museum, UK), COLLINS William (Curtin University, Australia), KUSKY Timothy (China University of Geosciences, Wuhan, China)， SAFONOVA Inna (Novosibirsk State University, Russia)

Description: One of the important tasks of solid-Earth science is to investigate deep crustal and whole lithosphere architecture, pathways and processes that create large-scale mineralization. Lithospheric (magmas and rock) probes and isotopic mapping (such as whole-rock Nd, zircon Hf) provide powerful datasets that can be used to interpret abundant geophysical data for these deep regions and to define their thermochemical structure that can inform energy- and mineral-exploration strategies. This session is focused on: (1) Continental growth and three-dimensional deep Lithospheric architecture from 3D to 4D;(2) Ore systems, their timing and location as related to lithospheric architecture and tectonic environment; and (3) Integration of petrology, geochemical, and geophysical datasets in constructing 3D-4D Lithospheric architecture and a predictive model for metallogenesis through time. Case studies on regional crustal and underlying mantle architecture, deep-lithosphere geochemical fingerprints, and regional metallogenesis are also welcome.

Session 9 3D delineation and predictive models of metallogenesis through time

Co-Conveners: Lü Qingtian (SinoProbe Lab., China), CHRISTOPHER Juhlin (Uppsala University, Sweden), ARTEMIEVA Irina (SinoProbe Lab, CAGS, China), YANG Zhiming (SinoProbe Lab. and Institute of Geology, CAGS, China), DENTITH Michael (University of Western Australia, Australia), LI Yaoguo (University of Colorado, USA)

Description: The geological processes in the lithosphere are closely related to deposition of minerals, many of which occur only in specific lithospheric settings. We invite contributions from geology, geophysics, geodynamics, geochemistry and petrology with focus on the links between the crustal structure, lithosphere evolution, plate tectonics, deep mantle processes, including LIPs, and the origin of various mineral deposits in different geodynamic and tectonic settings. Multidisciplinary contributions with focus on Precambrian cratons, continental collisional belts, modern and paleo-subduction systems, and large igneous provinces are particularly welcome.

Session 10 Earthquake Hazards 1: Before the earthquake: predicting, forecasting, alerting

Co-Conveners: ZHANG Yongxian (Institute of Earthquake Forecasting, CEA, China), CHEN Chieh-Hung (State Key Laboratory of Geohazard Prevention and Geoenvironment Protection, Chengdu University of Technology, China), KOSSOBOKOV Vladimir (Institute of Earthquake Prediction Theory and Mathematical Geophysics, Russian Academy of Sciences, Russia)，PERESAN Antonella（Seismological Research Centre National Institute of Oceanography and Applied Geophysics – OGS, Italy），WERNER Max（School of Earth Sciences, University of Bristol, UK）

Description: Earthquakes are not random occurrences but do lack an obvious principle of organization. Instead, earthquakes appear self-organized phenomena within Earth's hierarchy ranging from tectonic plates to grains of rocks that move relative to each other. Significant steps have been made towards assessing earthquake space-time-magnitude relationships and recognition of multifactorial patterns, showing the potential for reproducible, testable, and reliable operational earthquake forecasting. Regrettably, existing systems of operational early warning after an earthquake occurs have large "dead/blind zones" due to uncertainty in quick determinations of its size and location. Pre-earthquake anomalous phenomena exhibit spatiotemporal characteristics; realistic forecast assessment may consider different time scales from decades to months (or even weeks, or days) at global, regional, and local scales.

This session encourages the exchange of knowledge and sharing of good practices acquired through various methodologies. Contributions addressing the following theoretical and practical issues are welcome:
• Relevant state-of-the-art multidisciplinary observations.
• Systematic analysis, physical interpretation, and modelling of earthquake related processes.
• Validation and statistical justification of various candidates to precursors of catastrophic earthquakes.
• Earthquake forecast/prediction experiments and testing of predictability.
• Time-dependent seismic hazard assessment based on reproducible observables. • Methods for cascading risks assessment. • Problems in dissemination of earthquake related information.

Session 11 Earthquake Hazards 2: After the earthquake: rapid response

Co-Conveners: LI Ying (Institute of Earthquake Forecasting, China Earthquake Administration, China), WU Zhongliang (Institute of Earthquake Forecasting, CEA, China), MENG Guojie (Institute of Earthquake Forecasting, CEA, China), TAKAHASHI Hiroaki (Institute of Seismology and Volcanology, Hokkaido University, Japan), CARACAUSI Antonio (National Institute of Geophysics and Volcanology, Italy), RABEH Taha (National Research Institute of Astronomy and Geophysics, Egypt)，WU Shanshan (Shanghai Earthquake Administration, CEA, China)

Description: Rapid initiation of scientific expeditions after large earthquakes plays an important role in understanding earthquake cycles, analyzing disaster-causing factors, and promoting earthquake disaster prevention and mitigation. Numerous scientific expeditions have been conducted in many countries/regions stricken by devastating earthquakes in various initiation and work modes. Thus, we propose this session focusing on but not limited to: a) Causes of earthquakes; b) Processes of earthquake; c) Influence of earthquakes on regional earthquake hazard assessment. D) Factors contributing to earthquake disasters. E) Techniques applicable to earthquake investigation, such as space-borne electromagnetic detection, deep drilling, geoelectric observations, etc.

Session 12 Continental scientific drilling: Challenges and opportunities

Co-Conveners: ZENG Lingsen（SinoProbe Lab. and Institute of Geology, CAGS, China）, BOHNHOFF Marco (ICDP, Germany), BOUSH Park Lisa (University of Connecticut, USA), YASUHIRO Yamada (Kyushu University, Japan)

Description: Continental Scientific Drilling offers unique opportunities to investigate the workings of the interior of our planet. It contributes to major advances in many fields of socio-economic relevance, such as climate and ecosystem evolution, mitigation of geohazards, sustainable use of georesources, deep crustal and tectonic processes, and the deep biosphere. Drilling is the key method to retrieve uncompromised samples to complement surface studies and verify modelling results. Because boreholes provide access to the source regions of dynamic processes in the Earth's interior, they offer opportunities for near-field observations and long-term monitoring and acquisition of in-situ samples and -data. This session invites contributions that present ongoing and review recent achievements and scientific results from Earth sampling and monitoring through continental and marine drilling endeavors. In addition, we encourage papers that outline perspectives and visions for future drilling projects using new, innovative approaches, including but not limited to Land-to-Sea drilling, digital twins, and the use of scientific drilling legacy data.

Session 13 Developments in dense array seismology

Co-Conveners: YAO Huajian, ZHANG Haijiang (University of Science and Technology of China), TIAN Xiaobo (Institute of Geology and Geophysics, CAS, China), GUO Zhen (Southern University of Science and Technology, China), ZENG Xiangfang (Innovation Academy of Precision Measurement Science and Technology, CAS, China)

Description: Dense arrays have been widely used in seismological studies and have greatly facilitated our understanding of seismic source properties and Earth's structures of various length scales. Nodal arrays (geophones with built-in battery and digitizer) have more recently been used in high-resolution imaging of regional crustal structures, volcanic regions, fault zones, urban areas, oil and gas fields and mineral deposits, etc. These seismic nodes are much cheaper and easier to deploy than broadband sensors, making dense arrays with tens or hundreds of meters receiver spacing feasible for high-resolution imaging of shallow structures and high-precision earthquake locations. In addition, recent developments in

Distributed Acoustic Sensing (DAS) have make ultra-dense-array imaging and source location applicable even using existing telecommunication fiber cables. In this session, we invite contributions from all relevant studies using dense arrays composed of broadband seismometers, integrated geophones, or DAS. We are particularly interested in new techniques related to data processing, imaging, full waveform inversion, and source location (including induced and triggered earthquakes) based on dense arrays. Dense array applications with passive and active sources including ambient noise sources are all encouraged for submission.

Session 14 Electromagnetic geophysics

Co-Conveners: JIN Sheng (China University of Geosciences, Beijing, China), SCHULTZ Adam (Oregon State University, USA), YE Gaofeng （China University of Geosciences, Beijing, China）, COMEAU Matthew Joseph (Delft University of Technology, Netherlands), ZHANG Kun (SinoProbe Lab., China)

Description: We call for contributions on all aspects of Electromagnetic (EM) methods that advance our understanding of the tectonics and geodynamics of the lithosphere and asthenosphere. We seek presentations from field observations to physical/numerical modelling that image the solid Earth on both the regional and the global scales. Development of laboratory measurements of rock/mineral resistivity, new instrumentation, and new methodologies are also welcomed. Multi-disciplinary studies that combine the EM and other geophysical methods are particularly encouraged.

Special Sessions:

Session 15 SinoProbe-II, the next great geosciences voyage

Co-Conveners: ZHU Rixiang (Institute of Geology and Geophysics, CAS, China), DONG Shuwen (SinoProbe Lab. and Nanjing University, China), WANG Chengshan (China University of Geosciences, Beijing, China), HOU Zengqian (SinoProbe Lab. and Institute of Geology, CAGS, China)

Description: SinoProbe-II (2024-2030) has just been funded by the Chinese government with a grand new mission. Building on the foundation of SinoProbe-I, the ambitious aims of the SinoProbe-II are to: 1) significantly improve deep-Earth exploration technology; 2) increase the depth extent of deep Earth targets; 3) enhance the knowledge of the structure, composition, and deep evolution of the lithosphere of the

continental East Asia and its surface evolution, and 4) reveal the deep dynamics of mineralization, hydrocarbon accumulation, and geohazard. The expansion of deep Earth perspectives will lead to the birth of "Modern Deep Earth Science".

The main targets of the SinoProbe-II include: 1) Lithospheric Fine Structure Imaging: Integrated deep seismic profiling together with three-dimensional P- and S-wave velocity structure (broadband station spacing of 30×30 km), and electrical structural imaging of continental lithosphere at a 1°×1° resolution. 2) Deep Earth Composition: using techniques such as rock-probes, isotope tracing, and deep-penetration geochemistry, the material composition of the lithosphere at different layers will be determined. 3) Deep Processes and Surface Evolution Observational System, deploying multi-parameter, long-term, in-situ and real-time integrated physical, chemical, biological and geological observation systems in the zone where the continental margin and geodynamic processes are active. 4) Develop 10,000+ meter Scientific Drilling Technology and Equipment: developing extra-deep scientific drilling equipment, directly obtaining deep Earth samples, establishing geophysical and geochemical markers at great depths, testing or verifying the scientific validity of the geophysical and geology predictions. 5) Develop and broaden Deep Earth Science: study the deep materials and interfaces characteristics, deep Earth material circulation, deep Earth dynamics processes and mechanisms, sedimentary archives and environmental effects, investigate the mechanism of the unique properties of the lithospheric structure of East Asia in the Mesozoic and Cenozoic Eras and its response to the surface system, and the process of continental formation and evolution at the depth.

SinoProbe adheres to the principle of wide-open cooperation, and continues to exchange and share the science progress with global scientists, universities, institutes and organizations. SinoProbe strives to advance the geoscience for the sustainable development of the Mankind.

Special Sessions:

Session 16: Join the "China Deep Earth Science and Technology", SinoProbe Lab. Talent Boost Program

Co-Conveners: HOU Zengqian (SinoProbe Lab., China), TANG Jüxing (SinoProbe Lab. and CAGS, China), WU Dengding (CAGS, China)

Description: SinoProbe Laboratory (SinoProbe Lab.) is a new government-funded national fundamental research unit. It will serve as a platform of deep earth scientific research; the development center for core technology and key equipment for deep earth exploration; a support platform for the detection of deep energy, and deep mineral resources and underground space; the innovation base for deep earth observation experiments; the platform for sharing big data and the observing facilities for deep earth experiments; a new platform for international and intranational cooperation and talent development. It will be the operational unit of the SinoProbe-II, China Deep Earth Exploration Program, one of the national major scientific programs extending to 2030.

The SinoProbe Lab. relies on the Chinese Academy of Geological Sciences (CAGS), but is directly administered by the Ministry of Natural Resources with a flat management structure and flexible mechanisms. It re-organizes new research branches and integrates multiple existing institutions through different formats. The center will be constructed to facilitate joint experiments and tasks across the departments, and to pursue the maximum use of existing talent, material and financial resources by taking great advantages of different units, departments and nations. It will be a win-win sharing platform for all earth scientists and institutions worldwide.

At this session, Chinese Units will announce the new policies and positions to researchers worldwide with the goal of recruiting researchers, innovators, motivators and leaders to participate in the Deep Earth System Science (DESS). DESS includes Exploration of Deep Earth Structure, 4D Observation of Crustal Activity, Probing of Deep Material Composition and Distribution, Deep Material Cycles and Energy Conversion, Dynamic Behavior between Deep Earth Spherical Interfaces, Geodynamic Simulation, Data Processing and Imaging, Deep Exploration of Ore Deposits and Its 3D visualization, Super Deep Scientific Drilling, Exploration of Deep Gas and Oil, Geothermal Detection and Utilization, Development of Technology and Equipment (especially in geophysics), Deep Earth Science Big Data Management and Mining, and more. Please share your scientific experience, achievements, planning and visions of your field. We will provide diverse positions, hiring models, flexible work approaches and research funds to geoscientists in geology, geophysics, natural resources, engineering geology & geophysics, and big data,

whether early-career or world-renowned senior scientists. We will provide different integrated research & benefit packages according to individual situations based on bilateral agreement through personal negotiation.

Abstracts and Papers

The abstract submission tool opened online at https://deep2024.sinoprobe.org from June 1 2024. The deadline to submit your abstract is 1st August 2024. Only registrants to DEEP-2024 may submit abstracts. The abstract used for the online program shall not exceed two A4 pages including photos, figures and references.

Selected expanded abstracts will be published in Acta Geologica Sinica (English Edition) in the form of supplementary issue before the symposium. This special issue will be indexed by SCI. Detailed requirements of the abstracts can be found below in the instructions of abstract submission. ***Acta Geologica Sinica (***English Edition) is a Wiley open-access journal and indexed in Web of Science. Its current Impact Factor is 3.3, with a JCR category rank of 75/201 (Q2) in geoscience, multidisciplinary.

The research papers contributed to the symposium will be recommended to international journals for publication after the symposium. The full text of papers shall be written in accordance with relevant requirements of the Journals, such as ***Tectonophysics, Acta Geologica Sinica (English Edition)***, etc.

Presentation of Papers

The Scientific Programme of DEEP-2024 will consist of Colloquia and Symposia. Colloquia papers will be invited by the Organizing and Scientific Programme Committees. All scientific sessions will consist of oral and poster presentations. Oral and poster sessions will carry equal weight regarding the quality and level of the contributions.

Authors may choose either the oral or poster form for presentation of their contribution. The Organizing and Scientific Programme Committees will consider the author's preference for oral or poster session, but the final decision will be made by the Committee.

All DEEP-2024 sessions and events will be held physically. Only registered attendees will be able to access all of scientific content, from posters to general sessions. With more than 350 attendees from over 20 countries, we also offer numerous opportunities for you to meet new colleagues and friends.

Further guidelines for each session type will be given on https://deep2024.sinoprobe.org. Resources and instruction are also available to all presenters to ensure a successful presentation at the DEEP-2024. Please view the site for more information.

Call For One-Day Pre-meeting Workshop

Based on the preliminary topics of DEEP-2024 and hot issue in deep earth science, we **CALL for 1 day pre-meeting workshop proposals now**. The proposal must include workshop title, description (up to 1000 words), suggested conveners and speaker(s). The invited speakers of the workshop up to 4 persons. Please send your proposal to 1437922567@qq.com and sinoprobe@cags.ac.cn **before June 1, 2024**.

Field Trips

DEEP-2024 will offer post-meeting excursions intended for international participants. More details will be given on DEEP-2024 webpage.

Post-Meeting Field Trip 1：Ultrahigh-pressure metamorphism in the Dabie orogen: Tracing the continental crust into the mantle

Time Duration： 25-27, October,2024

Leader: Prof. WANG Qin, Nanjing University

Major cities or towns on the line: Beijing City (start), Hefei City, Nanjing City (end)

Geological features for observation and investigation:

The Dabie-Sulu orogen is one of the largest (~30,000 km^2) and best exposed ultrahigh-pressure (UHP) metamorphic terranes in the world. It was formed by northward subduction of the Yangtze craton beneath the North China craton in the Triassic. The central Dabie UHP metamorphic belt consists of interlayered pelitic and granitic gneisses, phengite-quartz schist, quartzite, marble, eclogite and garnet peridotite. These rocks commonly contain coesite and occasionally microdiamond as inclusions,

and was subjected to the peak metamorphism under P-T conditions of 3.0-4.0 GPa and 700-850 ℃ (i.e., >120 km) at 234-240 Ma. After a rapid syn-convergence exhumation under eclogite facies, these rocks experienced slow exhumation under amphibolite to greenschist facies conditions from the Latest Triassic to the Jurassic. In the Early Cretaceous, large amounts of granitic rocks intruded into the Dabie Mountains and resulted in a domal structure and the final unroofing of the UHP rocks.

During this field trip, we will visit four classic outcrops to see different types of eclogites and their country rocks: the Bixiling eclogite-garnet peridotite complex, the Xindian microdiamond-bearing eclogites within marbles, the Yezhai folded eclogites and eclogite-facies breccia, and a kilometer-scale eclogitic sheath fold in Shuanghe. These UHP metamorphic rocks provide a window to trace deep subduction and exhumation processes of continental supracrustal materials during continental collision.

Costs: 3000 CNY per-person (2400 CNY if share a standard room with two beds), which covers：

- High-speed train ticket from Beijing to Hefei (first class);
- Hotel stay (2 nights in Qianshan County on Oct. 25-26, one night in Nanjing University on Oct. 27), four-star hotel, meals and water in the field;
- Field vehicle rental/gasoline/toll, travel insurance;
- Administrative fees for preparing and setting up the field trip;
- Fees for entering private properties during the field excursion without sightseeing, etc.

Post-Meeting Field Trip 2： Meso-Cenozoic tectonics in the Daqingshan orogen, North China

Time Duration：25-28, October,2024

Leader: Prof. SHI Wei, Chinese Academy of Geological Sciences (CAGS)

Major cities or towns on the line: Beijing City (start), Ulanchap City, Hohhot City, Baotou City, Beijing City (end)

Geological features for observation and investigation:

- Pleistocene volcanoes to the north of Ulanchap City show lithospheric destruction in the Quaternary;
- The Middle Jurassic growth strata to the Baotou city constituted a roughly forward thrusting sequence with a slow uplift rate in the early stages and a suddenly accelerated uplift rate in the final stage,

responding to the initiation of Yanshanian deformation during 170–160 Ma due to N-S compression driven by the closure of the Mongol-Okhotsk Ocean.

- The Hohhot "MCC" to the north of Hohhot City, records top-to-southeast normal-sense exhumation of the deformed Archean-Proterozoic metamorphic basement that was intruded by Jurassic-Cretaceous complex granite mass. The basement was intruded by deformed Jurassic adakitic and undeformed Cretaceous A-type intrusions in the footwall. The mylonitic shear zone (S_1) located between undeformed Cretaceous granite and low-angle detachment faults with pervasively top-to-SE simple shearing (ca. 146-141 Ma). Here the three units composed the Hohhot "MCC" and reestablished Hohhot thermal upwelling-extensional structure (TUES) model: (a) the core-granite composed of Early Cretaceous (136-127 Ma) A-type granites; (b) the pure-shear-dominated shear zone (S_2^1) distributed in the core-granite periphery, with foliation (no lineation); (c) the low-angle detachment system (S_2^2) characterized by low-angle normal faults separating the footwall top-to-the-SE ductile structures and microbreccia zone from the hanging-wall Cretaceous supra-detachment basin along the flank of domal S1.

Costs: 3200 CNY per-person, which covers：

- Hotel stay (4 nights stay in the on Ulanchap City, Hohhot City, and Beijing City, respectively, on 25th-28th October 2024), meals and water in the field.
- Field vehicle rental/gasoline/toll.
- Administrative fees for preparing and setting up the field trip.
- Fees for entering private properties during the field excursion without sightseeing, etc.

Post Meeting Field Trip 3： Paleoseismic trenches on active faults in the suburb of Beijing

Time Duration：25 October, 2024

Leader: Prof. LIU Jing, Tianjin University

Major cities or towns on the line: Beijing City (start), Hebei Province, Beijing City (end)

Geological features for observation and investigation:

Major Holocene faults and large historical earthquakes in Hebei Province and Beijing; Late Quaternary sedimentary stratigraphy in trenches;

Seismic evidences in trenches, for blind faults and surface deformation zone, North China Plain; Large magnitudes of liquified evidences, including sand sills, sand volcanos, lateral spreading, *etc*, caused by instrumental, historical and ancient earthquakes; 3D liquefied bodies, revealed by combined trenches, including size, depth and expressions underground; Great earthquakes ruins, for example, -The Tangshan *M* 7.8 earthquake of 1976; Surface deformation zone, ruptured by great earthquakes in North China Plain;

Costs: 500 CNY per-person, which covers：

- Field vehicle rental/gasoline.
- Administrative fees for preparing and setting up the field trip.
- Simple lunch.
- Paleoseismic trench excavation and maintenance.
- Fees for entering properties during the field excursion without sightseeing, etc.

The Organizing and Scientific Program Committee reserves the right to limit the number of participants of field trip and to cancel or alter part of the route of the trip according to the local weather situation.

INVITATION FOR EXHIBITION

DEEP-2024 will provide dedicated areas for business and non-profit organizations to make close contact with academia, government, private sector and the international community. This should be a great opportunity to "Generate Leads, Build Your Brand, Enhance Your Knowledge, Meet the Industry, Launch New Products".

For more details and questions, please check the website or send your inquiry to 1437922567@qq.com or/and sinoprobe@cags.ac.cn.

GENERAL INFORMATION

Working Language

The working language of DEEP-2024 is **English**. All abstracts, papers, and presentations should be in English.

Registration

Online registration and abstract submission will start after **June 1, 2024** via http://deep2024.sinoprobe.org/.

Registration fees

Payment	Payment (before 1 September)	Payment (after 1 September)
Participating Member (non-participant in Workshop)	2500 CNY	3000 CNY
Participating Member (participant in Workshop)	3000 CNY	3600 CNY
Student Member (including Workshop)	1200 CNY	1500 CNY

Notice: Registration fee will **NOT** be refunded at any reason.

Payment

We accept a bank transfer or WeChat Payment for registration fees and field trip fees. There is no refund of the payment at any reason. **Accommodation fees must be paid directly to the hotel.**

Bank Transfer:

For Oversea Payment:

- Bank Name: Industrial and Commercial Bank of China
- Bank Address: Baiwan Zhuang Banking Office No. 15, San Li He Road Haidian District Beijing, 100037 China
- Account Holder Name: Chinese Academy of Geological Sciences
- Account Holder Address: 26 Baiwan Zhuang Road Xicheng District Beijing 100037 China
- Account No.:0200 0014 0900 8803 752
- Swift code: ICBKCNBJBJM

- Inquiry：Mrs. WEN Jun, Tel: +86-(10)-68999472, E-mail: 513841882@qq.com

中国境内转账：

- 户名：中国地质科学院
- 开户行：工商银行北京百万庄支行
- 纳税人识别号：110102400002574
- 银行账号：0200 0014 0900 8803 752
- 行号：102100000144
- 背书注明：汇款须备注 DEEP2024+单位名称
- 特别注意：会议报道现场索取发票及相关注意事项请参照网站说明。
- 财务联系人：王一博、文君
- 电话：010-68999300
- 邮箱：253678908@qq.com

WeChat Payment:

- QR Code would be provided on-line.
- Please endorse the payment by: DEEP2024 + Payer's Name + Unit in

Financial Support

DEEP-2024 will provide financial support to selected foreign and oversea Chinese invited speakers of the Workshop and Plenary Session as well as conveners and keynote speakers of the topical sessions. This financial support consists of four levels: international air ticket in economy class, accommodation fee, post-symposium field trip fee or cover the all these items. Registration fees are waived for foreign and oversea Chinese invited speakers and conveners. Limited financial support for travel expenses will be available to early career scientists worldwide to encourage their participation.

Applications for financial support should be made through the online Registration and Abstract Submission tool before **August 1, 2024 or as early as possible**.

If you have any question concerning financial support, please send e-mail to 1437922567@qq.com or/and sinoprobe@cags.ac.cn.

Visa Application

Registrants who are not entitled to visa exemption by agreement between China and the country concerned should hold valid visas and contact their travel agent or the Chinese Embassy, Consulate or other representative agency in their country or region regarding the need for visas to enter the People's Republic of China.

To apply for visas, registrants may be requested by the Chinese Embassy or Consulate to submit a letter of invitation. If you need an invitation letter, please send the following information, including you and your accompanying members, as soon as possible to dic@cags.ac.cn. If you only require the invitation letter for yourself, the online registration tool for the application submission is preferable. The following information is required:

1. Full name (family name, given name and others in that order).
2. Birth date (year/month/day).
3. Nationality.
4. Name of your institution and your position there.
5. Address, phone number, fax number, E-mail, etc.
6. Passport number.
7. City where you will apply for the visa (Embassy/Consulate)

Accommodation in Beijing

The reserved hotel list and booking page for participants will be provided on the DEEP-2024 webpage. The venue of DEEP-2024 is BEIJING NEW CENTURY HOTEL (Google as: Hotel Nikko New Century Hotel).

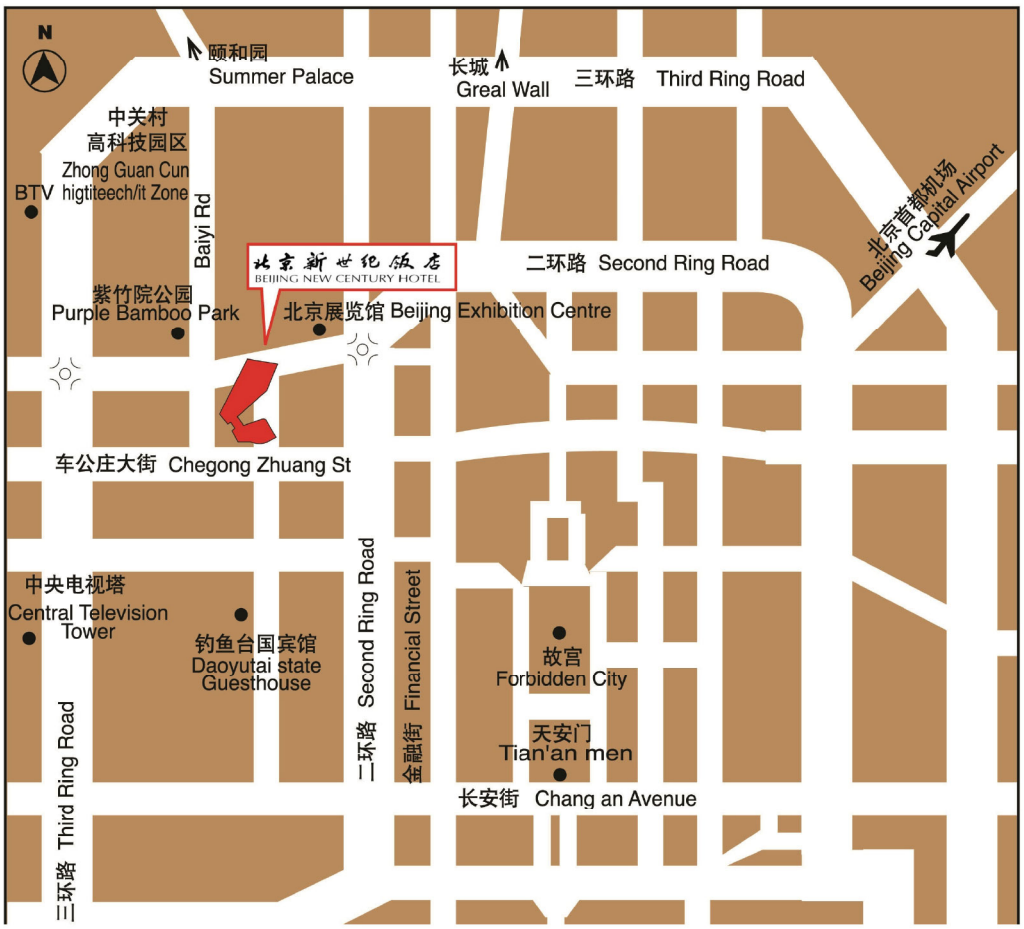
For the participants to make a reservation please provide the required information on the online registration form.

BEIJING NEW CENTURY HOTEL

Location of the Hotel： No. 6, Southern Road, Capital Indoor Stadium, Beijing China

Public Transit Stops Nearby：

- Subway:
  Exit B, Baishiqiao South Station of MTR Line 6 & Line 9
  Exit C, National Libarary Station / Exit D, Beijing Zoo Station of MTR Line 4
- Bus: There are many buses stops nearby, the stop names are as Bai Shi Qiao.



DATE MILESTONES

27 March 2024:	Deadline of session proposal
1 April 2024:	Website Online
1 June 2024:	Online Registration, Abstract Submission, Field Trip sign-up, and Housing Application are all open
1 August 2024:	End of abstract submission
1 September 2024:	End of field trip sign-up
10 October 2024:	Distribution of Program
21 October 2024:	Pre-meeting Workshop
22-24 October 2024:	DEEP-2024, Beijing

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5 Field Trip Service

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