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Five Scientific Advances by NIGPAS were selected as "2016 Top Ten Palaeontological Advances in China"

On March 22nd, the Palaeontological Society of China, the most renowned Chinese palaeontological organisation with 88-year history, announced its annual “Top Ten Palaeontological Advances in China” for 2016 for the first time. Five Advances with the leading efforts of NIGPAS researchers were selected, such as:

1) Molecular evidence of keratin and melanosomes in feathers of the Early Cretaceous bird *Eoconfuciusornis* (PAN Yanhong et al., *PNAS*).

2) Decimetre-scale multicellular eukaryotes from the 1.56-billion-year-old Gaoyuzhuang Formation in North China (ZHU Shixing et al., *Nature Communications*). This research is also recognised as "2016 Top Ten Geological Advances" announced by the Geological Society of China.

3) Debris-carrying camouflage among diverse lineages of Cretaceous insects (WANG Bo et al., *Science Advance*) and Extreme morphogenesis and ecological specialization among Cretaceous basal ants (PERRICHOT Vincent et al., *Current Biology*). Dr. PERRICHOT is now doing postdoc in our institute.

4) Meroblastic cleavage identifies some Ediacaran Doushantuo embryo-like fossils as metazoans (YIN Zongjun et al., *Geology*).

5) A Jurassic wood providing insights into the earliest step in Ginkgo wood evolution (JIANG Zikun et al., *Scientific Reports*). Prof. WANG Yongdong from our institute is the corresponding author of this paper.
The International Symposium for the Conservation and Scientific Research on Weng’an Biota was held in Guizhou

From April 1st to 3rd, the International Symposium for Conservation and Scientific Research on Weng’an Biota was held in Weng’an County, Guizhou Province, China. The symposium was co-organised by NIGPAS, Weng’an local government and Guizhou University.

The symposium was focusing on the phosphate mining in Weng’an, which was stopped due to its threatening to the outcrops of the 600-million-year Doushantu Formation containing well-preserved sponges and embryos of the earliest animals on Earth. The 3D preservation with cellular and subcellular structures of the fossils in the phosphate rocks has made Weng’an a unique geological window to the earliest evidence of animal evolution. Over 20 years, the discoveries in Weng’an have attracted the world’s attention and foretold the undiscovered possibility.

In order to keep the fossil remains from being pulverized by phosphate mining, the scientists from several countries gathered in Weng’an and talked with the government officers face-to-face. The experts include Prof. David Bottjer (University of Southern California), Prof. Douglas Erwin (American Museum of Natural History), Prof. Phillip Donoghue (Bristol University, Fellow of The Royal Society), and many Chinese palaeontologists. Finally, the government and the scientific society reached an agreement that some key outcrops and sections should be reserved permanently. The scientists will help the government to establish a popular science base (Geopark) in Weng’an, develop the scientific education and further the sustainable development in the local area.

NATURE: Mining threatens Chinese fossil site that revealed planet's earliest animals

SCIENCE: Early animal fossils at risk
A deep root for the Cambrian explosion in Pre-Cambrian (Geology, 2017)

Much uncertainty remains as to the temporal relationship between the Ediacaran and Cambrian biotas, yet this is critical to our understanding of the rise of metazoans. Prof. ZHU Maoyan from NIGPAS, here with his team, present new high-resolution carbon isotope chemostratigraphy and biostratigraphy for a terminal Ediacaran to Cambrian succession on the eastern Siberian Platform, Russia, which shows the presence of a succession of diverse fossil assemblages before the start of the basal Cambrian negative carbon isotope excursion (BACE).

Soft-bodied Ediacaran biota (Beltanelliformis) occurred before the start of the late Ediacaran positive carbon isotope plateau (EPIP), a mixed Ediacaran and Cambrian skeletal biota such as Cloudina, Anabarites, and Cambrotubulus. It appeared within the EPIP, and became diverse Cambrian-type small shelly fossils including Protopertonia and other protocondonts, halkieriids, chancelloriids, hyoliths, hyolithelminthes. The burrowing trace fossil Diplocraterion appeared at the beginning of the BACE. These integrated data show that taxa attributed to so-called Ediacaran and the earliest Cambrian skeletal biotas in fact overlap without notable biotic turnover, and thus refute the presence of a large isotope excursion coincident with mass extinction of all Ediacaran biota.

ZHU Maoyan and his colleagues propose a new biozone, i.e. the Cloudina-Namacalathus-Sinotubulites Assemblage Zone, to precede the known small shelly fossil (SSF) zones. These observations raise doubts as to whether there is any true separation between the Ediacaran and Cambrian skeletal biotas, and suggest that there is a deep root for the Cambrian explosion of metazoans.

The palaeodiversity of Agaricales: evidence from mushrooms and mycophagous beetles in amber (Nature Communications, 2017)

Mushrooms, or Agaricomycetes, are common, conspicuous and morphologically diverse fungi. Most agaricomycete fruiting bodies are ephemeral, so they are extremely rare in fossils. Up to now, all described species of gilled mushrooms, or Agaricales, have been known exclusively from amber. Among them, two forms are from the Mesozoic, including the earliest known mushrooms, *Palaeoagaracites antiquus* from a 99-million-year-old Burmese amber, and the slightly younger *Archaeomarasmius leggetti* from a New Jersey amber (about 90 million years old). The remaining three species are known from an early Miocene Dominican amber, some 20-million-year-old. Evidence indicating the origin and early diversification of Agaricomycetes is very limited.

Recently, a research team led by Prof. HUANG Diying from Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences (NIGPAS) reported a diverse of gilled mushrooms and mycophagous rove beetles from Burmese amber, the latter belonging to Oxyporinae, modern members of which exhibit an obligate association with soft-textured mushrooms. The results have been published in Nature Communications on March 16, 2017.

All mushrooms they studied are very well-preserved and can be grouped in four forms. A stalk and a complete intact cap containing distinct gills are visible in most of these amber mushrooms. The new discovery suggests a long-term evolutionary stasis of body form for at least 99 million years and highlights the palaeodiversity of mushrooms, pushing back the presence of agarics by at least 25 million years.

More interestingly, the mouthparts of these early oxyporine rove beetles, including enlarged mandibles and greatly enlarged apical labial palpomeres with dense specialized sensory organs, match those of modern taxa and indicate a mushroom feeding habit of these beetles. The diverse and morphologically specialized oxyporine beetles had also been appeared by the Early Cretaceous, some 125 million years ago. Their finding displays an ancient ecological community assembling diverse mushrooms and beetles and established on specialized trophic interaction by this early date.

INTERNATIONAL COLLABORATION

MoU signed between NIGPAS and international institutions

Memorandum of Understanding signed between NIGPAS and BGS

Prof. Mike Stephenson, Director of Science and Technology, British Geological Survey (BGS) visited NIGPAS in early May, 2017.

During his visit, Prof. Mike Stephenson and Vice Director ZHAN Renbin of NIGPAS signed a Memorandum of Understanding between two parties, furthering the cooperation in the fields of research, education and training, knowledge exchange and technological development in the multidisciplinary areas of geoscience.

The British Geological Survey is among the world-leading geological survey organisations. Focusing on the public affairs relating to the studies of earth and environmental processes, BGS serves as UK’s premier provider of objective and authoritative geoscientific data, information and knowledge to help society to use its natural resources responsibly, manage environmental change and be resilient to environmental hazards.

Memorandum of Understanding signed between NIGPAS and Swedish Museum of Natural History
Prof. Vivi Vajda, head of the Department of Palaeobiology, Swedish Museum of Natural History visited NIGPAS in May 2017. During her visit, Prof. Vivi Vajda and Vice Director ZHAN Renbin of NIGPAS signed a Memorandum of Understanding between two parties.

China and Sweden have long ties in the field of palaeontology extending back to the very early 1920s. The two institutions have research staff, collections, and research facilities that are mutually beneficial. Under this MoU, NIGPAS and Swedish Museum of Natural History will strive to develop new and ongoing research collaboration within the fields of palaeobotany and invertebrate palaeontology through mutual research visits, joint fieldwork expeditions and exchange of PhD students.

International activities with NIGPAS people

WANG Chengyuan of NIGPAS was awarded the Pander Medal

The 4th International Conodont Symposium (4th ICOS) in conjunction with the International Subcommissions on Stratigraphy of Devonian (SDS) and Silurian (ISSS) was held in Valencia (Spain) from 25-30 June 2017. During the meeting, Prof. WANG Chengyuan of NIGPAS was awarded the Pander Medal by the Pander Society, in recognition for his extremely active and high-quality contributions to conodonts and their applications to geologic history and stratigraphy.

WANG Weiming of NIGPAS was elected as Vice-President of the International Federation of Palynological Societies (IFPS)

During the 14th International Palynological Congress held in Salvador, Brazil last year, the International Federation of Palynological Societies (IFPS) established a new session of the governing council. According to the IFPS' constitution, a full brewing was made before voting for the vice-presidents. Recently, Prof. WANG Weiming of NIGPAS was elected as the vice-president of the IFPS' fifteenth Council.
Foreign visitors to NIGPAS

Prof. Tatsuo Oji from Nagoya University, Japan visited NIGPAS

Prof. Tatsuo Oji, former President of the Palaeontological Society of Japan (PSJ) and the staff of the Nagoya University, paid a visit to NIGPAS on February 23rd -24th. He discussed with Director YANG Qun of NIGPAS on the cooperation between PSJ and the Palaeontological Society China (PSC), gave a lecture on Ediacaran studies and observed the Ediacaran fossils stored in NIGPAS.

Prof. LI Rong-Yu from Brandon University, Canada visited NIGPAS

From May 5 to June 4, Prof. LI Rong-Yu from Brandon University, Canada paid an one-month visit to NIGPAS. He was invited to cooperate with Prof. ZHAN Renbin and Dr. HUANG Bing, and to give lectures and academic instructions to the students at NIGPAS. His recent research, which focused on multiple fossils from the Upper Cretaceous of Manitoba, Canada, was an excellent case for reconstructing the food chain/web in the past.

Macroevolution of Early Palaeozoic Faunas and IGCP 653 Workshop held in Nanjing

Macroevolution of Early Palaeozoic Faunas and IGCP 653 Workshop were held in Nanjing from May 16 to 17, 2017. More than 60 participants from China, Germany, Canada and Australia attended the workshop. Prof. ZHANG Yuandong of NIGPAS hosted the Opening & Closing ceremonies.

During the workshop, Prof. Thomas SERVAIS from University of Lille, France gave two lectures entitled “The GOBE: definition, conception and duration” and “Evolution of the phytoplankton and the marine food chains in the Lower Palaeozoic: Ordovician Plankton Revolution”, respectively. Prof. David HARPER from Durham University, UK gave lectures on “Evolution of the early metazoans in the Ediacaran and Early Palaeozoic”, “Lower Palaeozoic timescales and Ordovician stratigraphy” and “PAST Software: case history on heterochrony in trilobites and vertebrates”. Dr. FAN Junxuan of
NIGPAS reported on “An introduction to Paleobiology Database (PBDB) and Geobiodiversity Database (GBDB)” and “Guide to PBDB online system: structure, data and applications”.

Dr. Stephen KERSHAW from Brunel University London visited NIGPAS and gave lectures on sedimentology

From May 22nd to 23rd, Dr. Stephen KERSHAW from Brunel University London and Dr. Li KERSHAW from University of Cambridge were invited to NIGPAS to cooperate with Dr. LI Yue on Silurian biotas, sedimentology and environment.

Dr. Stephen KERSHAW gave a comprehensive lecture on sedimentology to the students, talking about the definition and taxonomy of carbonate and clastic rocks, teaching on how to learn from the geological map and thus construct its 3D model. Dr. Li KERSHAW talked about the sinter deposits and related carbonates.
Newly Assumed Guest or Visiting Professorship

From April 28 to 31, 2017, Prof. David J. BOTTJER from University of Southern California, USA made a series of lectures on Paleogenomics in NIGPAS. During his visit, NIGPAS Director YANG Qun presented him a medal of Guest Professor of NIGPAS.

Prof. Glenn A. BROCK from Macquarie University, Australia has assumed his CAS visiting professorship in May. His cooperative research project at NIGPAS is “High resolution chronostratigraphic correlation and palaeobiogeography of Cambrian animal life between China and Australia”. His collaborator is Dr. LI Guoxiang of NIGPAS.

Dr. Oliver LEHNERT from University of Erlangen, Germany has assumed his CAS visiting professorship in May. His cooperative research project at NIGPAS is “Ordovician climate change: the trigger to the GOBE”. His host is Dr. WU Rongchang of NIGPAS.

Dr. Anisimova S. ANATOLIEVNA from Institute of the Earth’s Crust of SB RAS, Russia has assumed her CAS visiting professorship in May. Her cooperative research project at NIGPAS is “Paleontological studies in the Siberian and Tarim cratons”, and her collaborator at NIGPAS is Prof. ZHOU Chuanming.
### Seminars given by international scholars, January - June 2017

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<td>Early sponges: phylogeny, diversity and the end-Ordovician Anji Biota</td>
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<td>Prof. Tatsuo OJI</td>
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<td>Prof. Li Rong-Yu</td>
<td>Reconstruction of food chain/web &amp; a case study from the Upper Cretaceous of Manitoba, Canada</td>
<td>2017-05-10</td>
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<td>Prof. Oliver LEHNERT</td>
<td>Significance of Early Palaeozoic palaeokarst for the interpretation of geodynamic processes and glacially induced sea level changes</td>
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<td>Fossil Treasures from the lower Cambrian of Australia: biofacies, biodiversity and biogeography</td>
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<td>Biotic consequences of the end-Cretaceous asteroid impact</td>
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Public outreach activities

- On March 6th, RONG Jiayu, professor of NIGPAS, Academician of Chinese Academy of Sciences, was invited to give a public lecture on the topic “Evolution and Humans” at Zhejiang University, Hangzhou.

- On April 18th, SHEN Shuzhong of NIGPAS, Academician of Chinese Academy of Sciences, was invited to be a guest lecturer on “YANG Zhongjina Forum” in Northwest University, giving a talk on “End-Permian Extinction”.

- On June 22nd, CHEN Xu of NIGPAS, Academician of Chinese Academy of Sciences, was invited to attend the Master’s Academic Forum in Central South University, giving a talk on “The Black Shale across the Ordovician-Silurian transition in South China”.

“Darwin Forum”, the public outreach activity organised by Nanjing Museum of Palaeontology and supported by the Department of Popular Science and SKLPS, NIGPAS, was praised as Top Ten Brand Activities on Popular Science by Jiangsu Association of Science & Technology Museums in late March.

On May 16th, Nanjing Museum of Palaeontology signed a cooperative agreement on the Programme of “Museum Biological Evolution Curricula for Primary School Students” with Daishan Experimental Primary School.

On May 21st, about 50 Nanjing citizens participated in the Popular Science Tour and paid visits to the Nanjing Museum of Palaeontology, NIGPAS. The Popular Science Tour is among the booming activities for science education in recent years.

From May 18th to 22nd, the Fossil Web of NIGPAS was invited to attend the 5th International Expo of Minerals and Gems in Binzhou, Hunan Province, China. The Exhibition Area for Interactive Experience by the Fossil Web was a success, diffusing the palaeontological knowledge to the public in a vivid way.

On May 20th, the 11th Annual Meeting for Fossil Connoisseurs was held in Nanjing Museum of Palaeontology. More than 20 fossil connoisseurs gathered in NIGPAS and discussed their fossil collections with the experts of NIGPAS.

From May 23rd to 26th, the series of activities of 2017 Popular Science Week in Jiangsu started in Nanjing International Exhibition Centre. Nanjing Museum of Palaeontology was invited to exhibit the new science discoveries by NIGPAS.
On May 27th, the 6th Council Meeting of the Working Committee for Popular Science was held in NIGPAS. 2016 Top Ten Popular Science News of Palaeontology was announced by the Working Committee.

On May 25th, Dr. FENG Weiming of NIGPAS was awarded the Medal of Innovation and striving by the Nanjing Association of Science and Technology.
Research Updates

↑ Distribution and evolution of Carboniferous reefs in South China (YAO Le and Wang Xiangdong, 2016, Palaeoworld)

↑ Morphology of diverse radiodontan head sclerites from the early Cambrian Chengjiang Lagerstätte, south-west China (ZENG Han et al., 2017, Journal of Systematic Palaeontology)

↑ Palynomorphs from massive metamorphosed rocks in Lvchun, Yunnan, Southwest China: evidence from the Ludlow Age and its geological implications (LIU Feng et al., 2017, Review of Palaeobotany and Palynology)
↑ Integrated carbon, sulfur, and nitrogen isotope chemostratigraphy of the Ediacaran Lantian Formation in South China: Spatial gradient, ocean redox oscillation, and fossil distribution (WANG Wei et al., 2017, Geobiology)

↑ Flourishing sponge-based ecosystems after the End-Ordovician mass extinction (Botting JP et al., 2017, Current Biology)

← Vegetation and climate changes over the last 30000 years on the Leizhou Peninsula, southern China, inferred from the pollen record of Huguangyan Maar Lake (MENG Yuting et al., 2017, Boreas)
† First record of fossil basidiomycete clamp connections in cordaitalean stems from the Asselian–Sakmarian (lower Permian) of Shanxi Province, North China. (WAN Mingli et al., 2017, *Palaeogeography Palaeoclimatology Palaeoecology*)

← Specialized adaptations for springtail predation in Mesozoic beetles (Yin ZW, Cai CY et al., 2017, *Scientific Reports*)

← A new SIMS zircon U-Pb date from the Ediacaran Doushantuo Formation: age constraint on the Weng’an biota. (ZHOU Chuanming et al., 2017, *Geological Magazine*)
↑ The stratigraphic complexity of the middle Ediacaran carbon isotopic record in the Yangtze Gorges area, South China, and its implications for the age and chemostratigraphic significance of the Shuram excursion. (ZHOU Chuanming et al., 2017, Precambrian Research).

↑ Extreme adaptations for probable visual courtship behaviour in a Cretaceous dancing damselfly (ZHENG Daran et al., 2017, Scientific Reports).

Early evolution of specialized termitophily in Cretaceous rove beetles. (CAI Chenyang et al., 2017, Current Biology)

Evolution and palaeogeographical dispersion of the radiolid rudist genus Auroradiolites (Bivalvia: Hippuritida), with descriptions of new material from Tibet and archived specimens from Afghanistan (RAO Xin et al., 2017, Papers in Palaeontology)


The presumed ginkgophyte Umaltolepis has seed-bearing structures resembling those of Peltaspermales and Umkomasiales (Herrera F, Shi GL et al., 2017, PNAS)
Benthic foraminiferal assemblages and bottom water evolution of the Portuguese margin since the Middle Pleistocene. (GUO Qimei et al., 2017, Global and Planetary Change)

Appendages of an early Cambrian metadoxid trilobite from Yunnan, SW China support mandibulate affinities of trilobites and arthropods. (ZENG Han et al., 2017, Geological Magazine)

Charophytes from the Cretaceous–Paleogene transition in the Pingyi Basin (Eastern China) and their Eurasian correlation. (LI Sha et al., 2016, Cretaceous Research)

The first Late Triassic Chinese triadophlebiomorphan (Insecta: Odonatoptera): biogeographic implications (ZHENG Daran et al., 2017, Scientific Reports)

New species of Thylacocephala (Arthropoda) from the Spathian (Lower Triassic) of Chaohu, Anhui Province of China (JI Cheng et al., 2017, Paläontologische Zeitschrift)

A new diminutive euphyllophyte from the Middle Devonian of West Junggar, Xinjiang, China and its evolutionary implications. (XU Honghe et al., 2017, Alcheringa)
New Books

As a handbook for both beginners and experts on palynology, the new book summarised the taxonomy and characters of Quaternary pollen and spores, including 409 plates, containing 1000 genera of pollen and spores in 300 families.


The Permian pandemic ammonoids in Nanpanjiang Basin (41 genera, including two new genera Glenisteroceras and Fusicrimites, and 56 species, including 21 new species) are systematically described and/or discussed in the new memoir. A relatively complete Permian basinal ammonoid sequence with six zones has been newly recognized in South China.

The Research Group on the Mesozoic Terrestrial Biotas

The Research Group on the Permo-Carboniferous Floras led by Prof. WANG Jun mainly focuses on studies of the Carboniferous and Permian fossil plants and their ecology through multidisciplinary approach, including palaeobotany, taphonomy, stratigraphy, sedimentology, and palaeoclimatology.

The group currently consists of 2 research professors, 1 associate research professor, 2 assistant research professors, and 5 graduate students. Each member of the group has his/her own specified research area. Tens of Carboniferous and Permian fossil sites have been excavated, yielding thousands of well-preserved fossil plants. The following 5 topics are main research themes of the group: 1) Reconstruction of the Permian “coal forest” buried by a volcanic ash fall with a high resolution from Inner Mongolia; 2) Systematic palaeobotany, utilizing materials such as impressions, compression specimens with cuticles, and permineralized woods; 3) Regional and global biotic response to the environmental and climatic changes during this time interval, i.e., the transition from an icehouse world to a greenhouse world; 4) Interactions between plants and other organisms/environments (plant-animal interactions, plant-fungus associations, wildfires); 5) Formative mechanism of mixed floras in northern China, including Cathaysia-Angara mixed flora, and Cathaysia-Euramerica mixed flora.

Recent projects of the group funded by NSFC and CAS include studies on the Permo-Carboniferous floras and stratigraphy in northern China. During the past 5 years, the group has published more than 40 papers in international journals, such as, *PNAS*, *Review of Palaeobotany and Palynology*, and *Palaeogeography, Palaeoecology, Palaeoclimatology*. 
M.Sc., Ph.D., and Postdoctoral Programs

NIGPAS offers M.Sc. and Ph.D. degree-granting programs and a postdoctoral program in paleontology, stratigraphy, and geobiology. Undergraduate students or M.Sc. holders who are interested in applying for M.Sc. or Ph.D. programs are warmly welcome and are required to take the entrance examinations (two subjects respectively related to the particular specialities).

The postdoctoral program is open to young scientists worldwide who hold a Ph.D. degree and are under the age of 40. All Ph.D. holders of geology and related subjects who are interested in collaborating with staff members of NIGPAS are encouraged to contact us to start a new life at NIGPAS. The main research areas of our Institute include:

- The Origin and Evolution of Early Life on Earth
- Evolutionary Paleontology
- Chronostratigraphy
- Systematic Paleontology (of all invertebrate fossil groups and fossil plants)
- Paleocology, Paleogeography and Paleoclimatology
- Molecular Paleobiology
- Geobiology
- Co-evolution of Life and Environment in deep time
- Applied Paleontology and Stratigraphy

Interested applicants may contact relevant experts of our Institute or the particular office for foreign affairs of NIGPAS for more information (see contact information below).

Program for Visiting Scientists

Three types of fellowships, which are primarily funded by the PIFI program of Chinese Academy of Sciences (CAS), are available for overseas scientists to conduct research and collaborations at NIGPAS. They are: 1) Distinguished fellows, 2) Visiting fellows, 3) Postdoctoral fellows. A similar fellowship program is also open to young scholars from Taiwan.

Relevant information is available at the following web site:

http://international-talent.cas.cn/front/index.html#/bicsite/pifiIntroduce/pifi (latest update on 2017-07-17)

Interested applicants also can contact us for more information using the address at the end of the passages.

Faculty Positions (3-5 yearly) Open: Applications invited

Recent Ph.D. holders and experienced scientists of various career levels, with research capabilities potentially enhancing or supplementing the current programs at NIGPAS (please refer to http://english.nigpas.cas.cn/rh/tps/), are invited to apply for our faculty positions. Interested persons are encouraged to send a letter of enquiry to the contact information below.
Recruitment for Senior Faculty Positions

As one of the academic leaders, successful applicant will be responsible to establish a research program in paleontology and related fields that will complement or enhance the institute current research programs. Interdisciplinary approaches are especially encouraged.

The applicant should have a demonstrable track record and abilities to develop an advanced research program in paleontology and related areas. A Ph.D. degree and former appointment at a senior level in universities or other academic institutions are required. A minimum of three years full time commitment is required for this position.

For successful applicants, the institute will provide a start-up research grant (negotiable amount), necessary lab and office space, and supporting staff.

**We also would appreciate your recommendation of any capable candidates. Let us know.**

Contact us

For comments and suggestions, please contact:
Office of Foreign Affairs
Nanjing Institute of Geology and Palaeontology, CAS
39 East Beijing Road, Nanjing 210008, P.R. China
Phone: 0086 25 83282105 Fax: 0086 25 83357026 Email: ngb@nigpas.ac.cn; chxzh@nigpas.ac.cn