



新疆及中亚邻区地学合作研究

Earth Science Research Cooperation in Xinjiang and Adjacent Regions in Central Asia

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International Collaboration in Central Asia

一、背景分析 Introduction

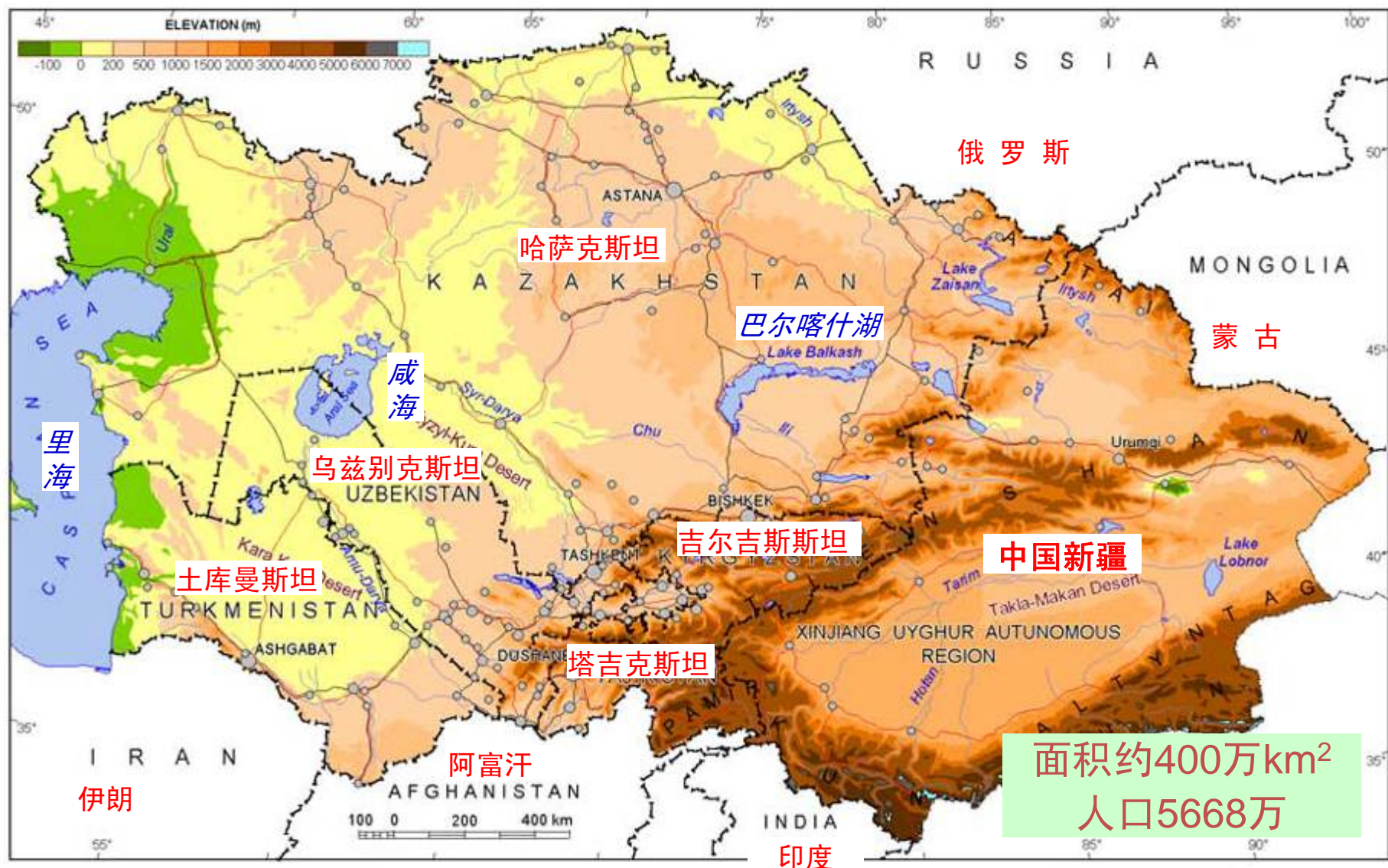
(一) 周边国家情况

A survey of neighboring countries in Central Asia

- 广义的中亚泛指亚洲中部, 包括中国新疆、西藏、内蒙古 3 个自治区和蒙古国、原苏联中亚地区
- 狭义的中亚仅包括阿姆河和锡尔河流域, 原苏联解体后, 这一区域的哈萨克斯坦、乌兹别克斯坦、吉尔吉斯斯坦、土库曼斯坦和塔吉克斯坦五国已形成一个大体相同的政治文化区域

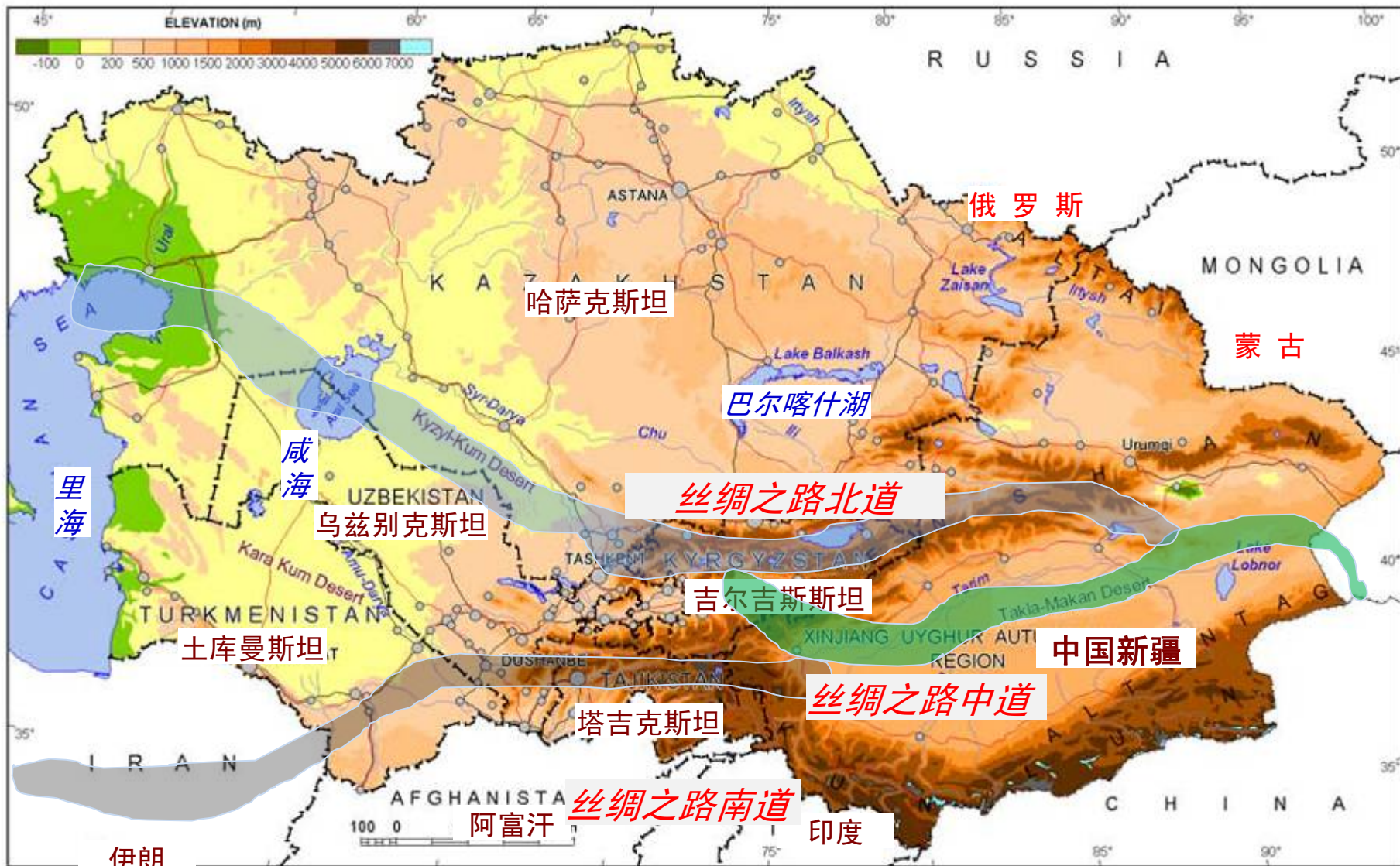
一、背景分析

(一) 周边国家情况



面积约400万km²
人口5668万

中亚五国及周边国家略图



中亚五国及周边国家丝绸之路分布略图

Simplified map of the five countries in Central Asia and neighboring countries showing the Silk Roads

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二、中亚地质-矿产资源简介

Summary of Geology & Metallogeny in Central Asia

(一) 中亚地质: 国际前沿 Central Asian Geology: hot topic



RANK	RESEARCH FRONTS	CORE PAPERS	CITATIONS	MEAN YEAR OF CORE PAPERS
1	<u>Tectonic evolution of the southern central Asian orogenic belt</u>	24	1,176	2010.1
2	Global terrestrial isoprene emissions and climate	25	1,300	2009.8
3	U-Pb zircon ages and geochronology of southern Tibet	45	2,521	2009.7
4	Greenland ice core chronology and the Middle to Upper Paleolithic transition	28	2,490	2009.6
5	Nucleation and growth of nanoparticles in the atmosphere	33	1,835	2009.6
6	Climate change and precipitation extremes	30	2,098	2009.5

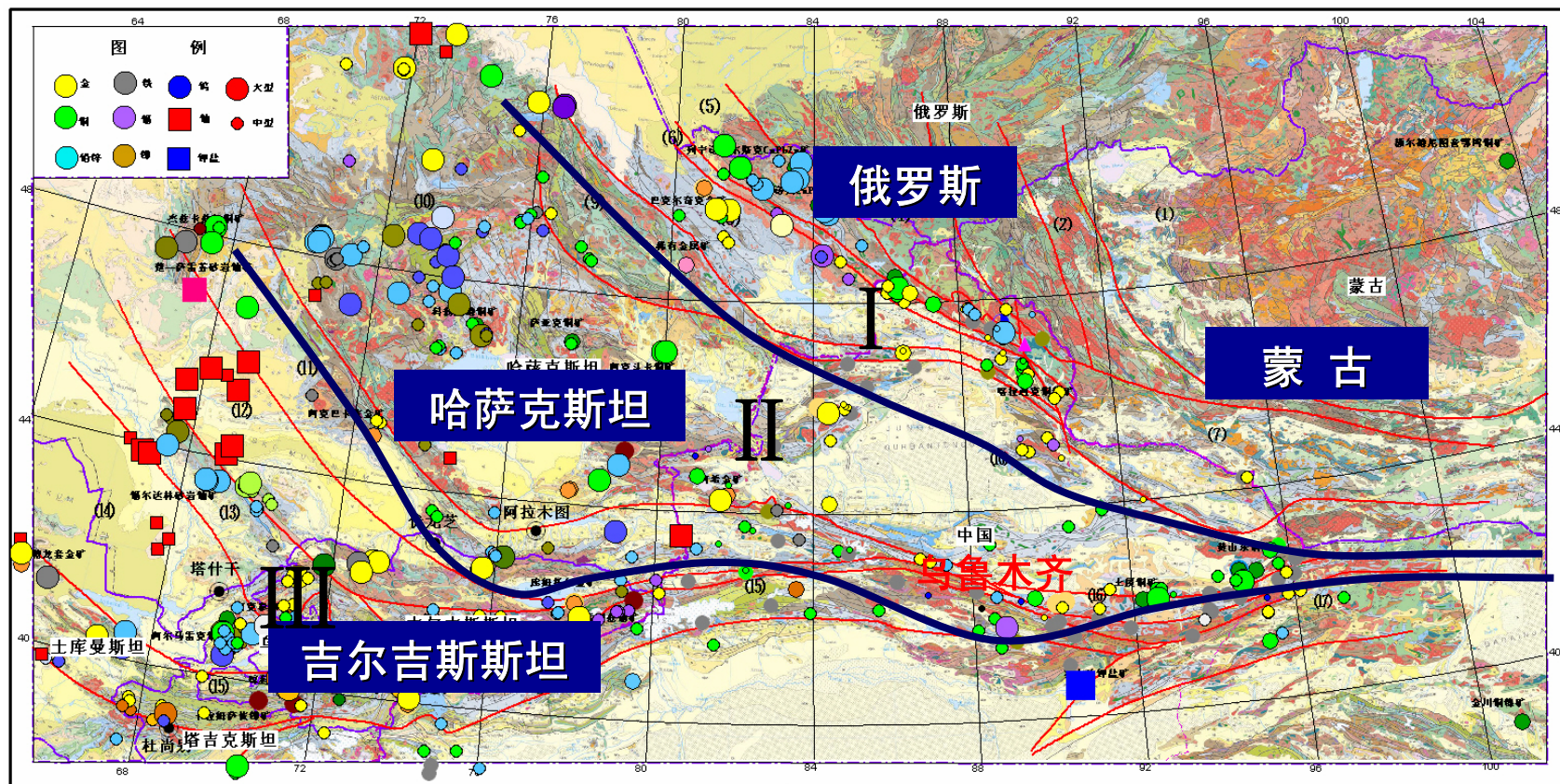
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二、中亚地质-矿产资源简介

(二) 中亚五国矿产资源：地质构造-成矿时空耦合

Mineral resources of the five countries in central Asia:
space-temporal coupling of tectonics and metallogeny



- I - 阿尔泰构造成矿带
- II - 环巴尔喀什-准噶尔成矿带
- III - 天山构造成矿带

(二) 中亚地区矿产资源

Mineral Resources in Central Asia

- 新疆与蒙、俄、哈、吉、乌等国同处中亚造山域，具有良好的多金属成矿地质条件，矿产贮藏十分丰富，大型矿床到单个矿点（其中包括金属、非金属、稀有金属等种类）经统计约13000个

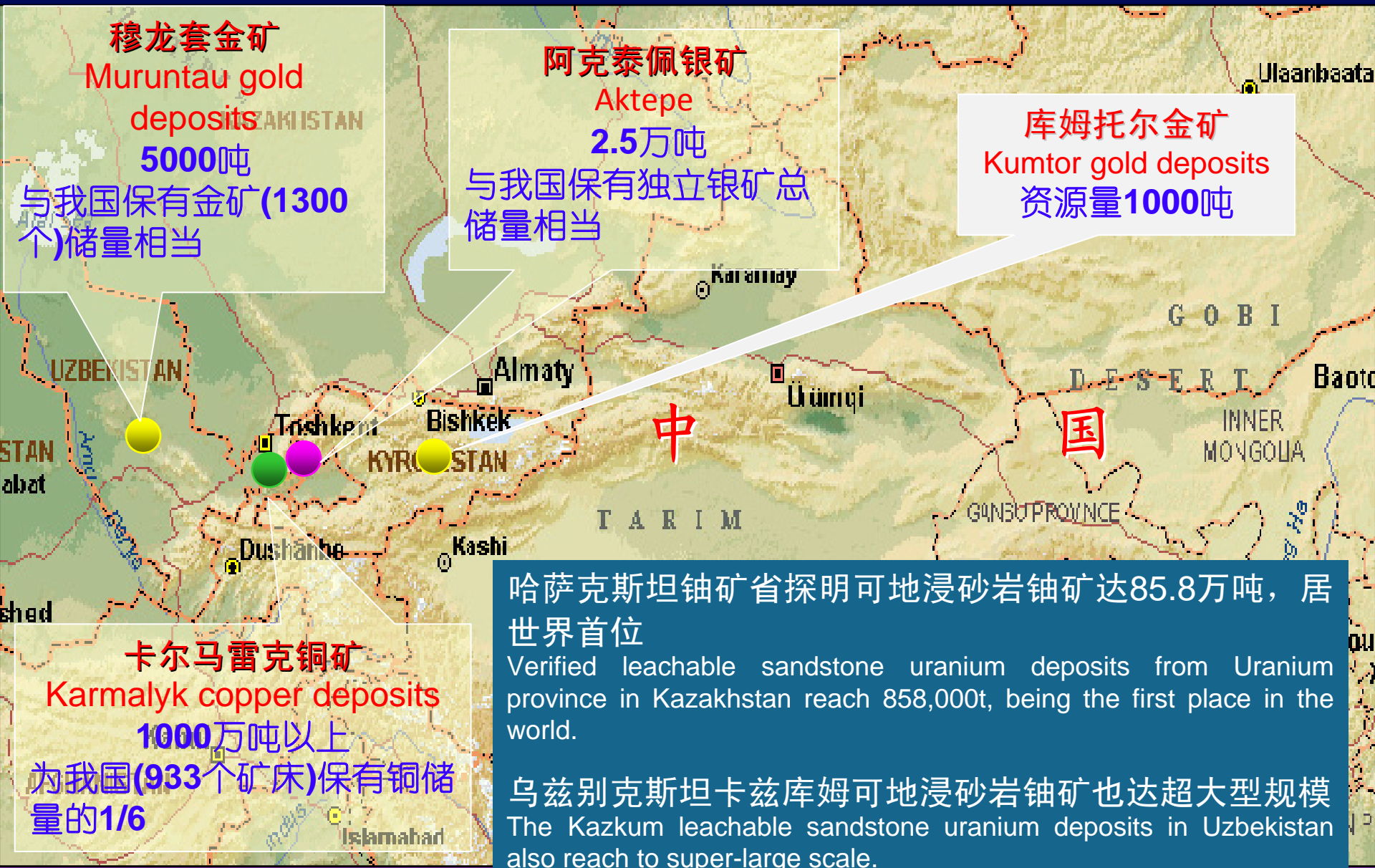
Xinjiang, Mongolia, Russia, Kazakhstan, Kyrgyzstan, Uzbekistan and other countries, located in the Central Asia Orogenic Belt, have favorable metallogenic geological conditions and abundant mineral resources. Deposits and ore spots (including metal, nonmetal, rare metals and other species) approximately reached 13000.

- 乌兹别克斯坦的穆龙套金矿（金储量4800吨）

The Muruntau gold deposit in Uzbekistan (gold reserves 4800t)

中亚造山带南部大型-超大型矿床分布

Distribution of Large/Super-large Ore Deposits



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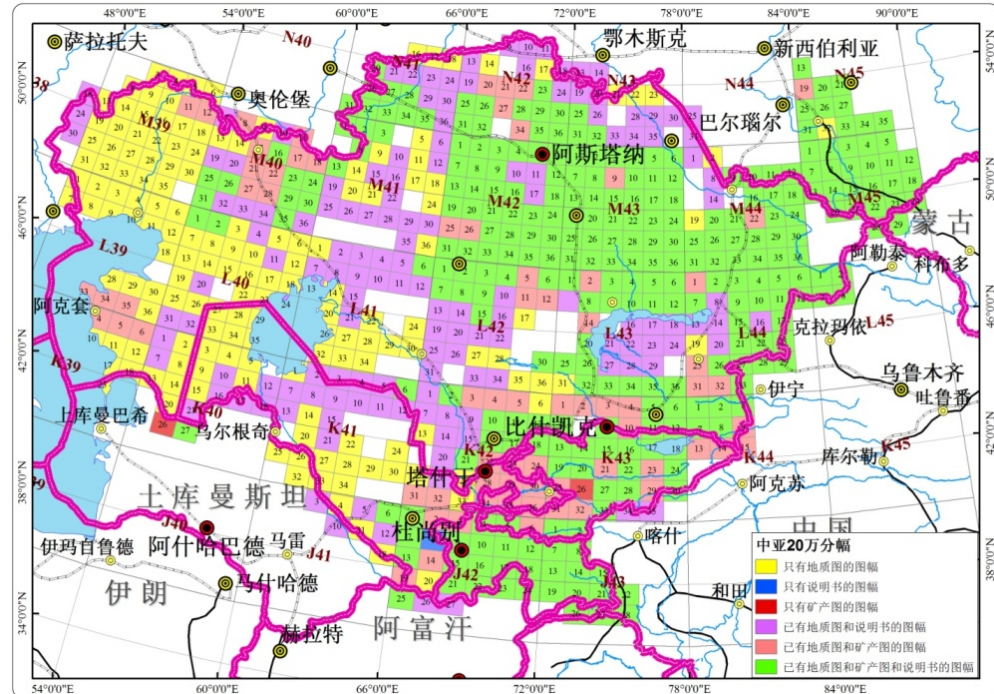
三、中亚国际合作实践

International Cooperation in Central Asia

(一) 合作计划 Cooperation Plans

- 多 多年来地质矿产勘查积累了大量的基础资料和矿床（矿）点数据
A large number of basic information and ore data has been accumulated
- 在上合组织框架下进一步加强矿产资源合作，是我国和中亚邻国的共同需求和重要合作领域

Strengthening the cooperation of the mineral resources in the Shanghai Cooperative Organization (SCO) framework is the common demand and important fields of cooperation between China and neighboring countries from Central Asia

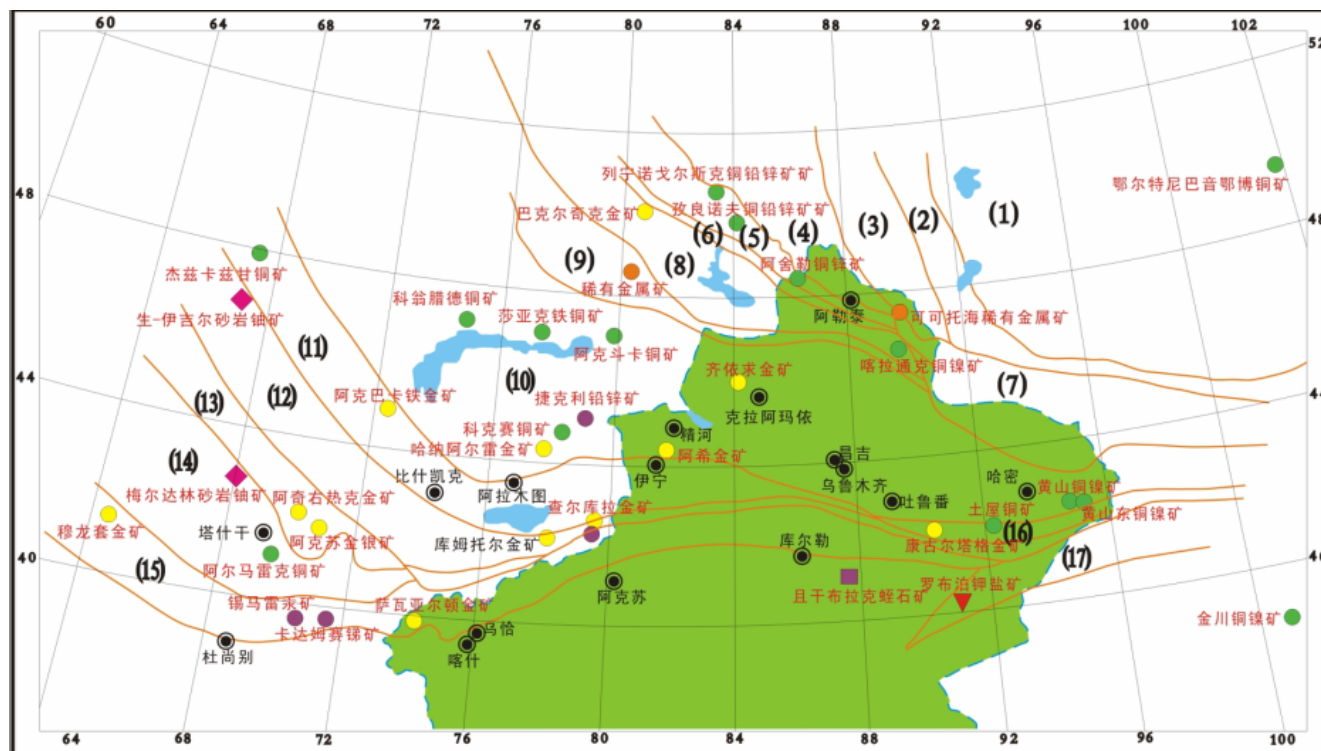


三、中亚国际合作实践

- 新疆和中亚邻国成矿带相连，具有相似的成矿背景，通过合作研究，实现信息共享，相互借鉴，相互促进

Xinjiang and neighboring countries from Central Asia share similar metallogenic belts and similar ore-forming background.

Through collaborative research to achieve information sharing and mutual promotion

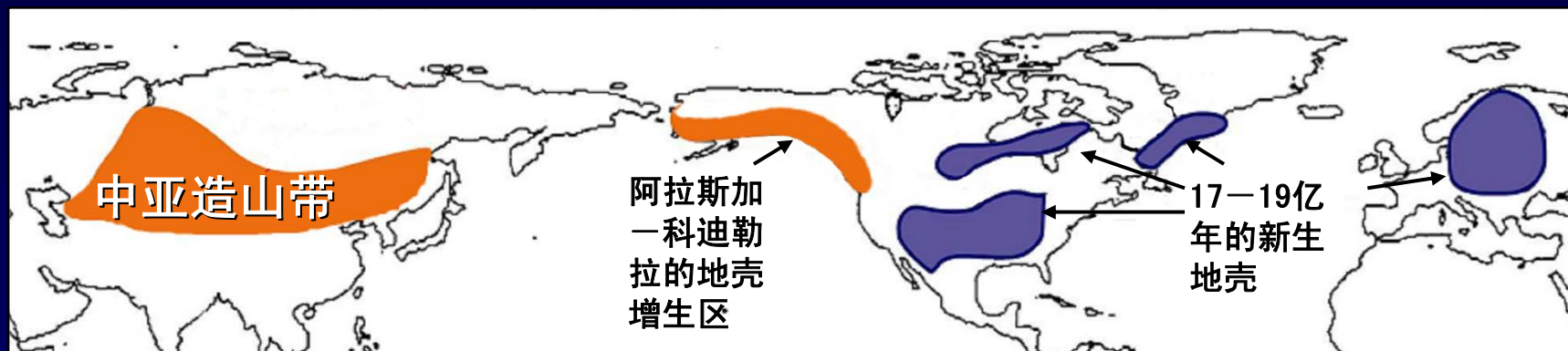


- (1) 巴颜乌拉震旦-寒武成矿带；(2) 哈尔锡林早古生成成矿带；(3) 德伦-萨格赛-诺尔特晚古生成成矿带；(4) 北阿尔泰早古生成成矿带；(5) 矿区阿尔泰-南阿尔泰晚古生成成矿带；(6) 额尔齐斯挤压带；(7) 东准噶尔-南蒙古晚古生成成矿带；(8) 卡尔巴石炭纪成矿带；(9) 成吉斯-塔尔巴哈台早古生成成矿带；(10) 巴尔喀什-准噶尔古生成成矿带；(11) 楚-伊犁古生成成矿带；(12) 北天山早古生成成矿带；(13) 中天山前寒武-古生成成矿带；(14) 库拉乌-费尔干纳前寒武-古生成成矿带；(15) 南天山古生成成矿带；(16) 觉罗塔格晚古生成成矿带；(17) 北山晚古生成成矿带

□ 国际重要计划项目 Important International Projects

研究成果已被多个国际地质对比计划和国际岩石圈计划作为重要研究基础之一，开展进一步研究

Results have been accepted as one of important researches by many IGCP and ILP projects, and further studies have been conducting.



- IGCP 420 中亚显生宙大陆增生
- IGCP 473 基于GIS的中亚成矿作用
- IGCP 480 横跨中亚造山带构造对比: 对大陆增生和陆内变形的意义
- IGCP 592 中亚大陆构建
- 国际岩石圈计划 地球增生系统

IGCP 592: Continental construction in Central Asia compared to actualistic examples in the western Pacific

合作首席科学家



Inna Safonova
Russia



Reimar Seltmann
UK



Min Sun
China



Wenjiao Xiao
China



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Comparative evolution of past and present accretionary orogens: Central Asia and the Circum-Pacific

Urumqi, Xinjiang Uygur Aut. Reg. China
4–10 September 2011

CONVENERS:

Alfred Kröner
Beijing SHRIMP Center, Institute of Geology, Chinese Academy of Sciences, Beijing, China, alkroener@igcas.ac.cn

Robert J. Stern
Geosciences Dept., University of Arizona, Tucson, Arizona, USA, rsstern@arizona.edu

Bor-Ming Jahn
Dept. of Geosciences, National Taiwan University, Taipei, Taiwan, bmjahn@ntu.edu.tw

Wenjiao Xiao
State Key Laboratory of Lithospheric Evolution, Institute of Geology & Geophysics, Chinese Academy of Sciences, Beijing, China, wj-xiao@mail.igcas.ac.cn

组织国际重要学术会议进行研讨

Penrose Conference, one of the most important meetings in Geological Society of America

GEODYNAMICS

Asian continental growth

The ancient Central Asian Orogenic Belt formed during a period of extensive continental crust formation. Comparison with modern continent-building systems suggests that the processes that operate today were already active at that time.

Karel Schulmann and Scott Paterson

作为彭罗斯Penrose 国际会议召集人之一，组织中亚增生学术讨论；Nature Geoscience系统地评述了此次会议对大陆增生研究的推进作用

continental crust. The complex history of this important orogen is still debated. At the Penrose conference on the Comparative Evolution of Past and Present Accretionary Orogens: Central Asia and the Circum-Pacific, held in Urumqi, China (Fig. 1), in September this year, the evolution of this orogenic system was investigated

years. During compression and mountain growth, existing continental crust is often melted and recrystallized. In contrast, accretionary orogens form above subduction zones, where dense oceanic crust sinks beneath less-dense oceanic or continental crust. Subduction brings together segments of crust of various types,

itself, are accreted to the overriding plate. Accretionary orogens are characterized by almost continuous plate convergence over hundreds of millions of years. This is because the subduction zones are continually fed by oceanic crust formed at a nearby mid-ocean ridge. Modern examples include the orogens forming

Beishan Orogen in NW China

Accretionary tectonics, magmatism, eclogite
and granulite complexes

IGCP 592

北山野外国际学术研讨会



2013年8月22-28日

IGCP#592 "Continental construction in
Central Asia"

(二) 合作交流 Cooperation and Scientific Exchange

- **中心定位：**面向国家战略需求、国际地球科学前沿，服务国家资源安全与战略，促进西部矿产资源基地建设，增强国家地质科技创新能力
Development orientation: in the light of national strategic demand and international earth science frontiers, to serve national resources security, to promote the base construction of mineral resources in western area China, and to strengthen the national geological scientific innovation.
- **主要任务：**创建区域成矿作用理论，研发矿产资源勘查新方法，发展成矿预测、矿产勘查和资源综合利用的新技术；
形成“理论支撑 - 技术集成 - 勘查示范 - 矿业开发”的创新价值链，为构建国家矿产资源安全保障体系提供科学依据和技术支撑，成为西部开发人才培养的重要基地



吉尔吉斯斯坦科学院阿德舍夫地质研究所

The Adyshev Institute of Geology

National Academy of Sciences of the Kyrgyz Republic

- 主要从事地质矿产研究，有9个研究室，在天山地壳发育和演化方面积累了一系列研究成果和基础数据
- 编制1:50万、1:100万吉尔吉斯斯坦地球动力学图和成矿图，1:50万吉尔吉斯斯坦天山变质岩系图
- 建立了大型-超大型矿床的模型、贵金属矿床模型



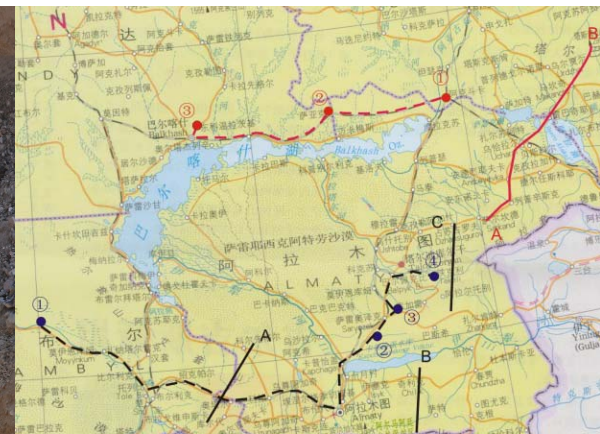
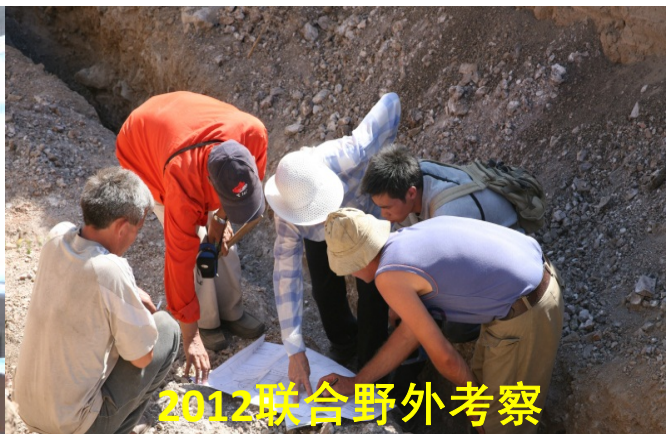
2013联合野外考察
Joint Field work in Kyrgyz Tianshan (2013)

哈萨克斯坦地质研究所

Institute of Geology

National Academy of Sciences of the Republic of Kazakhstan

- 主要从事区域地质学、地层学、成矿学、地球化学、矿床学和石油地质学研究，有19个研究室
- 拥有一个地质矿产资料室，图书资料9876本，地质图件325套，主要为1:100万地质图、1:20万地质矿产图以及矿床规律图，564个矿床（点）资料等
- 研究所有一大批老专家，具有丰富的地质矿产理论知识



2012联合野外考察
Joint Field work in Kazakhstan (2012)

塔吉克斯坦地质与地震研究所

Institute of Geology, Earthquake Engineering and Seismology of the Academy Science of the Republic of Tajikistan

- 前身为苏联科学院塔吉克地质研究所，是塔吉克斯坦地质学研究中心，主要从事古生物学、地层学、大地构造学、新构造地质学、成矿学研究
- 图书馆：拥有3万多套地学图书资料，主要包括地质、构造、地球物理、矿床、地震等资料
- 编制了1:50万天山地质构造图（塔吉克斯坦境内部分）



2013联合野外考察
Joint Field work in Tajik Tianshan (2013)

(三) 基地建设 Joint Research Labs in Central Asia

1.矿产资源合作工作站建设 Joint Research Centers

2.矿物岩石样品分析试验 Joint Labs for Mineral Analysis

- 在境外建立样品分析实验室
- 支持样品运输通关



合作国家科学院领导考察中亚联合实验室

Vice directors from academies of collaborative countries visit joint labs in Central Asia



敬请批评指正

Thanks for your attention

E-mail: wj-xiao@mail.iggcas.ac.cn



中吉联合野外考察

Joint Field work in Kyrgyz Tianshan (Late August-Middle September, 2014)