

# SCHOOL OF MINES

First-class School

First-class Academic Group

First-class Academic Work

First-class Discipline

First-class Major

First-class Students

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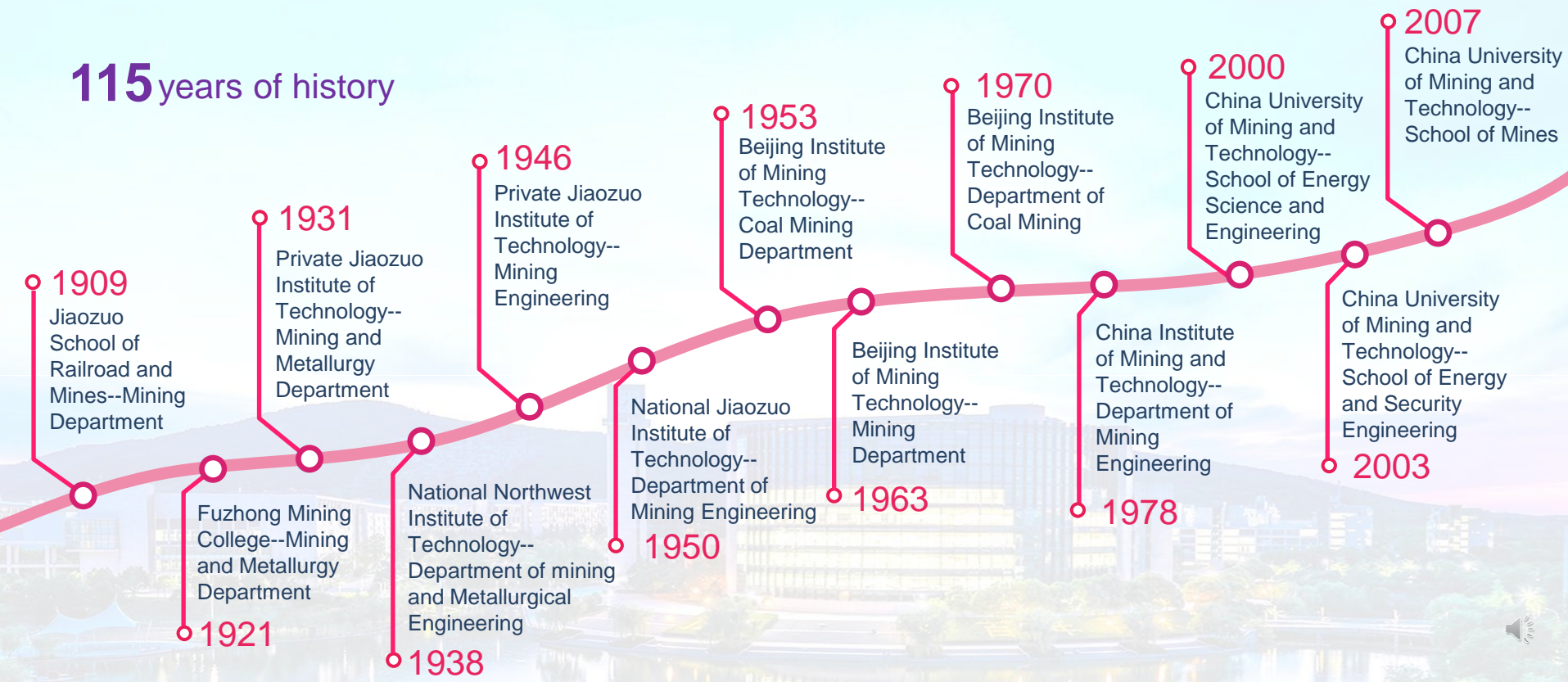
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## FIRST-CLASS SCHOOL

115 years of history



## FIRST-CLASS SCHOOL

### 5 Undergraduate Majors

Mining Engineering 1909

New Energy Science and Engineering 2019

Intelligent Mining 2021

Industrial Engineering 1985

Transportation 1988

### 6 Departments

Mining Engineering

Open-Pit Mining Engineering

Resource Engineering

New Energy Science and Engineering

Industrial Engineering

Transportation

### 18 National-and-Provincial Teaching and Research Platforms

Mining-Engineering Postdoctoral Scientific Research Mobile Station

State Key Laboratory of Coal Resources & Safe Mining

Overseas Expertise Introduction Center for Discipline Innovation in Resource Utilization and Disposal of Solid Waste in Mines

National Experimental Teaching Demonstration Center of Mining Engineering

National Virtual Simulation Experimental Teaching Center of Mining Engineering

Education Ministry Key Laboratory of Deep Coal Resources Mining

Jiangsu Engineering Laboratory of Mine Earthquake Monitoring and Prevention

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## FIRST-CLASS SCHOOL

Degree Authorization Centers			Names	Time
<div>A full coverage of degree authorization centers (15 centers of 8 types)</div> <div>The earliest authorization (1998)</div>	Doctoral Degree Authorization Centers	First-level Discipline	Mining Engineering	1998
		Second-level Discipline	Mining Engineering	1984
			Resource Development Planning and Design	2002
		Interdiscipline	Artificial Intelligence	2020
			New Energy Science and Engineering	2021
	Professional Degree	Resource and Environment	2021	
	Mater Degree Authorization Centers	First-level Discipline	Mining Engineering	2006
		Second-level Discipline	Mining Engineering	1981
			Resource Development Planning and Design	2002
			Management Science and Engineering	1981
			Artificial Intelligence	2020
		Interdiscipline	New Energy Science and Engineering	2021
			Resource and Environment	2019
		Professional Degree	Engineering Management	2010
			Transportation	2019

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## FIRST-CLASS ACADEMIC GROUP

**153** Full-time faculty  
and staff

**46** Professors

**40+** Talents with honored titles  
at or above provincial level

**3** Academicians



Minggao Qian



Manchao He



Hongpu Kang

**6** National-level  
Talents



Jixiong Zhang



Yanli Huang



Bingxiang Huang



Qiangling Yao



Lei Zhang



Dan Ma



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## FIRST-CLASS ACADEMIC GROUP

EXCELLENT

TALENTS

49 ONES  
SINCE 2010

Talent Type	Name and Grant Time
National Outstanding Youth Fund of NSFC	Jixiong Zhang (2017)
National Plan of 10000 Leading Talents	Nong Zhang (2016); Jixiong Zhang (2016); Bingxiang Huang (2019); Yanli Huang (2021)
National Excellent Youth Fund of NSFC	Bingxiang Huang (2015); Yanli Huang (2020); Dan Ma (2021)
Young Scholars program of National High-level Talents Plan	Qiangling Yao (2021); Lei Zhang (2023)
National Young and Middle-aged Experts with Outstanding Contributions	Dongsheng Zhang (2017)
The Special Government Allowance of the State Council	Nong Zhang (2010); Qingxiang Cai (2012); Jixiong Zhang (2018); Shihao Tu (2020)
National High-level Talents	Dongsheng Zhang (2017)
Young and Middle-aged Leading Talents of the Ministry of Science and Technology	Nong Zhang (2013); Jixiong Zhang (2014); Bingxiang Huan (2018); Yanli Huang (2021)
National Teaching Team	Shihao Tu (2010)
China Youth Science and Technology Award	Yanli Huang (2020)





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## FIRST-CLASS ACADEMIC GROUP

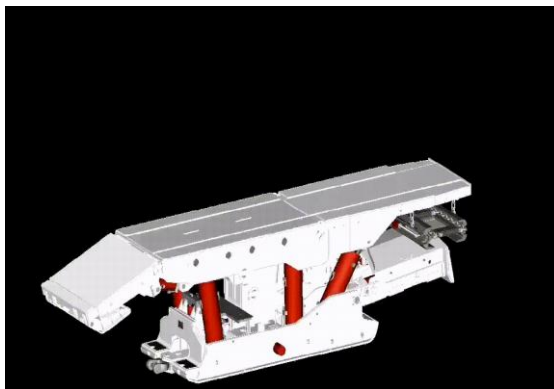
### Rock Control and Green Mining

**8**Prof. **9**A.P. **3**Lecturer

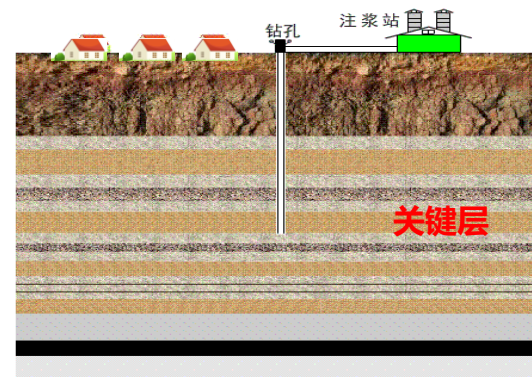
Developed the first comprehensive mechanized backfilling and coal mining core equipment in China, achieving efficient coordination between backfilling of mined-out areas and control of the surrounding rock strata. Demonstration projects have been established in 26 mining districts across Shandong, Anhui, and Inner Mongolia.



**Comprehensive mechanized solid backfilling coal mining technology.**



**Hydraulic support for backfilling coal mining.**



**Overburden isolation grouting backfilling technology.**

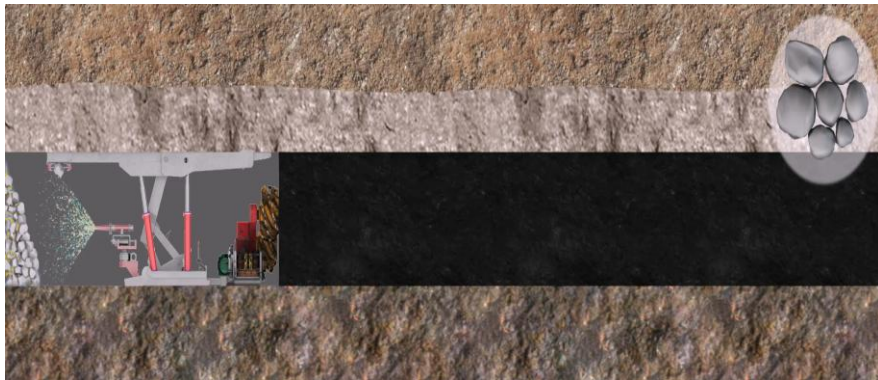
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## FIRST-CLASS ACADEMIC GROUP

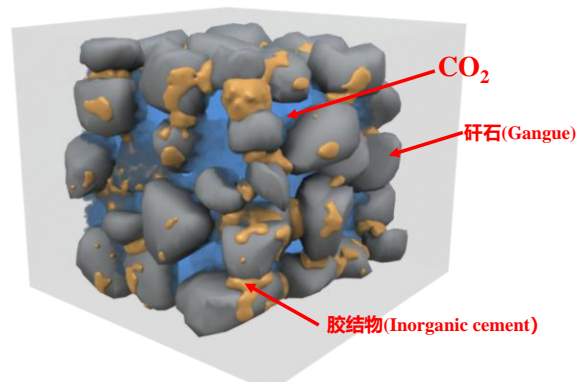
### Rock Control and Green Mining

**8**Prof. **9**A.P. **3**Lecturer

Conducted research on the construction and mechanical behavior of high-porosity, negative-carbon backfilling materials from coal gangue, the mechanisms and performance of negative-carbon processes, the development of rapid-setting gel materials, and negative-carbon filling mining technologies. Breakthroughs are anticipated in the area of negative-carbon filling materials and technologies.



**Negative-carbon efficient backfilling and mining technologies and processes.**



**Backfilling body of CO<sub>2</sub>, coal gangue, and rapid-setting binder mixture.**

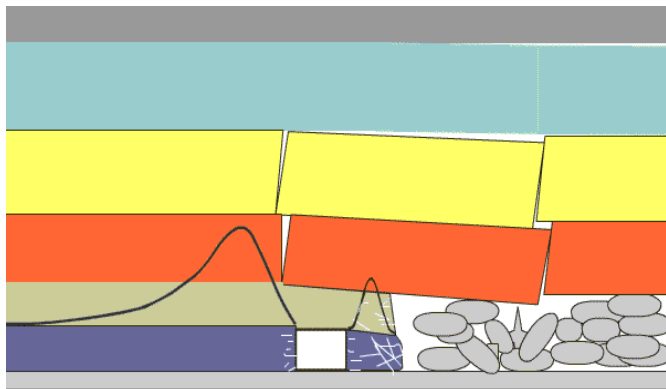


## FIRST-CLASS ACADEMIC GROUP

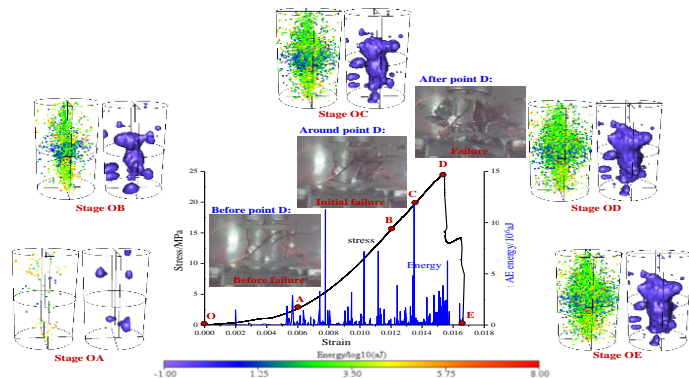
### Rock Burst

6 Prof. 4 A.P.

Established dynamic and static loading stress, vibration, and energy dynamics models, revealing the mechanisms underlying the superimposition of dynamic and static loading that induces impact ground pressure. Proposed the principle of synergistic monitoring and early warning across the stress, vibration, and energy fields.



The process of impact ground pressure induced by the superimposition of dynamic and static loading.



Stress-vibration-energy  
response information

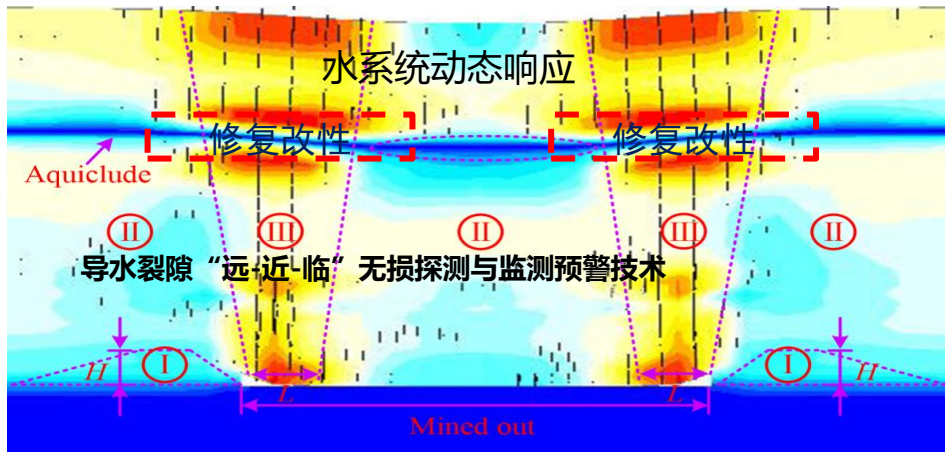
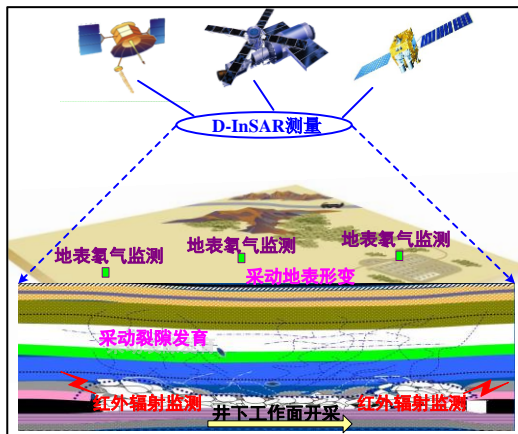
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## FIRST-CLASS ACADEMIC GROUP

### Water Retention Mining

6 Prof. 5 A.P.

Developed non-destructive detection and monitoring early warning technologies for water-conducting fractures using the "far-near-lateral" approach, techniques for the modification and restoration of aquitards, and mining area planning and design methods based on water resource carrying capacity. This has resulted in a comprehensive technical system for protective and efficient coal mining that prioritizes water resource conservation.



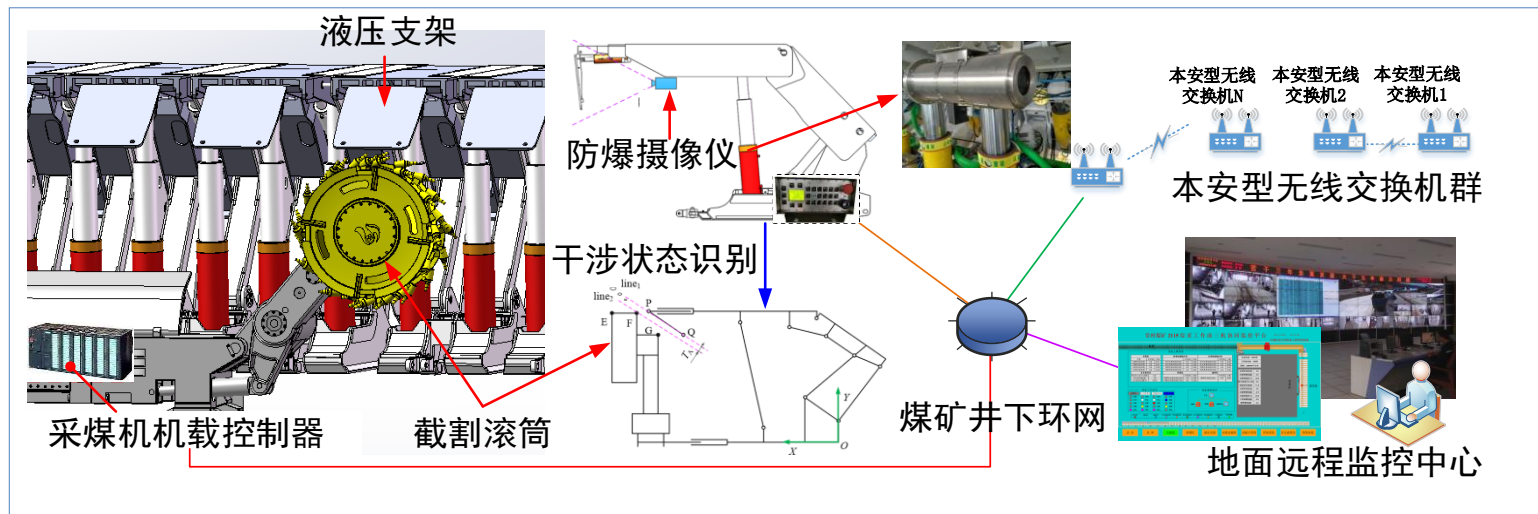
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## FIRST-CLASS ACADEMIC GROUP

### Intelligent Mining

7 Prof. 7 A.P. 2 Lecturer

Developed multi-parameter precise perception technologies and monitoring system equipment for the posture information of intelligent mining environments and equipment groups. This addresses challenges such as difficulties in sensing complex mining environments, low accuracy, and the low reliability of sensing equipment.



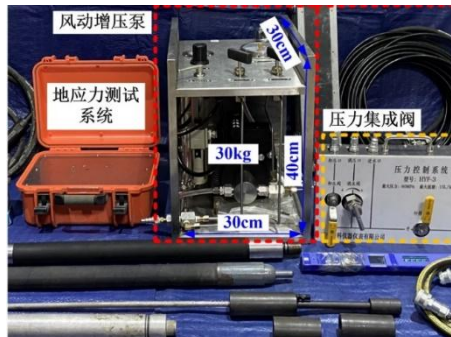
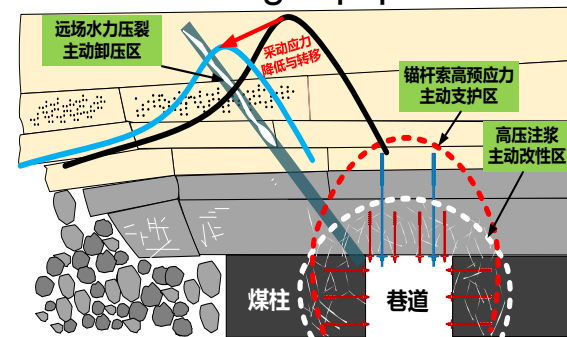
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### Roadway surrounding rock control

11 Prof. 13 A.P. 10 Lecturer

Revealed the mechanisms of rheological behavior and structural instability leading to large deformations in surrounding rock of deep, heavily mined tunnels, and established an integrated synergistic control theory of "pressure relief-modification" for tunnels. Invented China's first portable, pneumatic-hydraulic fracturing equipment for in situ testing of ground stress, coal rock strength, and deformation, filling a gap in the availability of geomechanical parameter testing equipment for deep coal seams in China.



Integrated synergistic control theory of pressure relief and modification for tunnel surrounding rock

Complete set of equipment for in situ testing of geomechanical parameters of coal rock masses

## FIRST-CLASS ACADEMIC GROUP

### Roadway surrounding rock control

11 Prof. 13 A.P. 10 Lecturer

Innovated integrated equipment for rapid excavation and anchoring in deep tunnels, achieving automatic mesh laying, automatic support, precise positioning, automatic cutting, and automatic guidance. This innovation has reduced the tunnel formation period from 10 months to 4 months, while shortening the formation cycle of mining faces by 60%.



High-efficiency integrated equipment for excavation and anchoring in deep tunnels



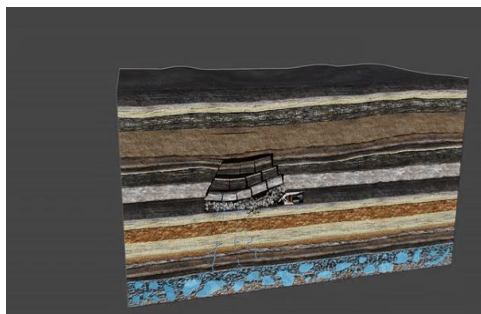
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## FIRST-CLASS ACADEMIC GROUP

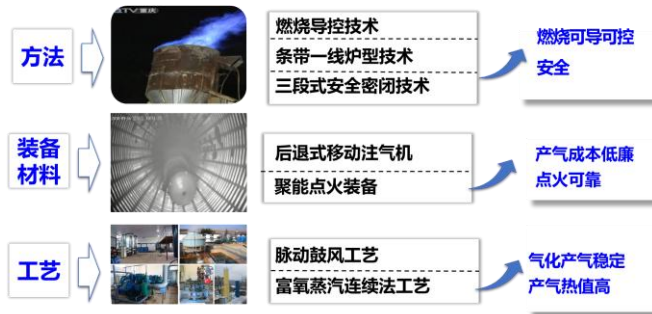
### Mining of coal-related resources

6 Prof. 2 A.P. 4 Lecturer

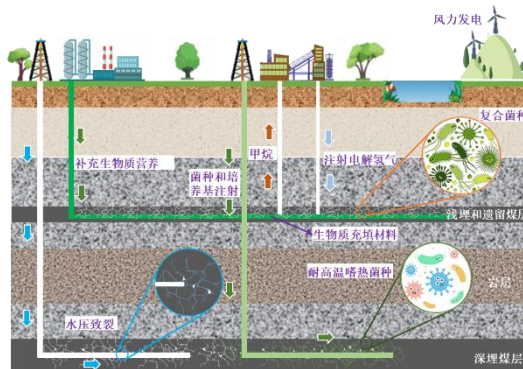
Focused on the extraction of associated resources from coal seams has conducted studies on unconventional geothermal extraction technologies, the mechanisms of in situ coal resource gasification, coupled multi-physical field theories for in situ fluidized extraction, and microbial in situ gas production technologies. These efforts aim to transform solid resources into gaseous or liquid forms for extraction.



Formation mechanisms of hydrothermal-type high-temperature mine hazards



Underground in situ coal gasification technology



Microbial in situ fluidized extraction of coal



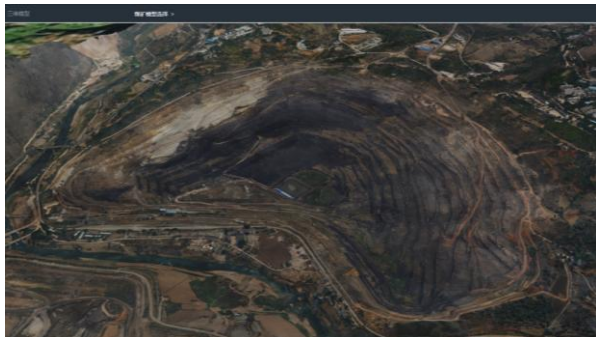
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## FIRST-CLASS ACADEMIC GROUP

### Open-pit mining

2Prof. 5A.P. 2Lecturer

Developed a smart mining operation system based on mining technology, aerial surveying and remote sensing technology, geographic information system (GIS) technology, and cloud technology, resulting in a data intelligent platform featuring "one map, one table, and one diagnostic report."



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## FIRST-CLASS ACADEMIC WORK

Since 2010

**100+ Million**  
**Annual S&T Budget**

**5**  
**National S&T  
Award**

**150+**  
**Ministerial and  
Provincial S&T Award**

**120+** National  
S&T Funds

**200+** Ministerial and  
Provincial S&T Funds

**5000+** College-Enterprise  
S&T Projects

**1000+** SCI Paper

**3000+** EI Paper

**1000+** Granted Patents

**20+** Software copyright

**10+** Industry standard

**100+** Published Textbooks and Monographs



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## FIRST-CLASS ACADEMIC WORK

### National Major Projects (24 Terms since 2010)

Type	Name	Leader
Key Program of NSFC	A Basic Research on Underground Utilization of Coal-Gangue-Based Functional Materials	Jixiong Zhang
National Major Talent Project	Coal Resource Exploitation and Ecological Environment Protection in typical Ecologically Fragile Mining Areas in the Yellow River Basin	Yanli Huang
Joint Key Program of NSFC	A Study on Basic Theory and Key Technology of Gob-side Entry Retention with Grouping Controlled Cutting Roof in Fully Mechanized Caving Mining	Jianbiao Bai
National Key R&D Program	The Theory and Technology of Coordinated Mining of Coal and Associated Strategic Metal Minerals	Bingxiang Huang
National Major Talent Project(Youth) of NSFC	Filling Mining and Water Resource Protection	Yanli Huang
National Major Talent Project(Youth) of NSFC	Seepage Mechanics of Rock Mass and the Prevention and Control of Water Inrush	Dan Ma
Key Program of NSFC	A Basic Research on Rapid Tunneling of Coal Roadway and Intelligent Control of Surrounding Rock	Nong Zhang
National Key R&D Program	Research and Demonstration of Key Technical Equipment for Underground Intelligent Sorting and in-Situ Filling in Deep Coal Mines	Jixiong Zhang
National Key R&D Program	Deep Underground Sorting and Filling Space Layout Method and Selective Recovery Technology	Shihao Tu
National Major Talent Project of NSFC	Filling Mining and Strata Control	Jixiong Zhang

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## FIRST-CLASS ACADEMIC WORK

Awards of National-Ministerial-Provincial-and-Industrial-Level (33 Terms Since 2010)

Type	Name	Winner	Level
State Technological Invention Award	Comprehensive Mechanized Solid Waste Dense Filling and Coal Mining Integration Technology	Jixiong Zhang Yanli Huang	Second Prize
State S&T Progress Award	Key Technologies for Integrated Prediction and Prevention of Deep Dynamic Disasters in Coal and Gas Outburst Mines	Linming Dou	Second Prize
State S&T Progress Award	Technology and Application of High Step Throw Blasting and Bucket Shovel Dumping in Opencast Coal Mine	Keming Li	Second Prize
State S&T Progress Award	In Situ Rapid Test of Geomechanics and Surrounding Rock Control Technology in Coal Mine	Jianbiao Bai	Second Prize
State S&T Progress Award	Key Technology of Coal Mining and Ecological Environment Protection in Ecological Fragile Area of Ordos Basin	Liqiang Ma	Second Prize
S&T Progress Award of Anhui Province	Stratification Control Theory and Key Technology of Surrounding Rock of High Stress Unloading Vulnerable Roadway in Deep Mine	Nong Zhang	First Prize
Technological Invention Award of Shanxi Province	Test Method and Device for Cracking - Dynamic Seepage Characteristics of High Temperature and High Pressure Rock Mass	Zhijun Zhang	First Prize
Technological Invention Award of Sichuan Province	Fracturing Control Theory and Technology of Hard Roof Coal Face End Hanging Roof	Bingxiang Huang	First Prize



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## FIRST-CLASS DISCIPLINE AND MAJOR

**Traditional and  
Advantageous  
Disciplines**

**Ranking No. 1 in  
Discipline Evaluation  
by Education Ministry**

**Leading  
Domestically  
and Overseas**

1984

Doctoral Degree  
Authorization Center  
Mining Engineering

1988

One of the National  
Major Disciplines  
Mining Engineering

2006

One of First 985  
Innovation Platform for  
Advantageous Disciplines  
Mining Engineering

2010

One of the Advantageous  
Disciplines In Jiangsu Province  
Mining Engineering

2022

QS Ranking: 14th

1981

Master Degree  
Authorization Center  
Mining Engineering

1985

Postdoctoral Scientific  
Research Mobile Station  
Mining Engineering

1995

First National  
"211 Project"  
Mining Engineering

2007

National Major  
First-level Discipline  
Mining Engineering

2017

National Word-Class  
Construction Discipline  
Mining Engineering



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## FIRST-CLASS DISCIPLINE AND MAJOR

### Mining Engineering

National First-class Major

### Intelligent Mining

A Newly Authorized Major

### Transportation

Provincial First-class Major

### New Energy Science and Engineering

A Newly Authorized Major and Doctoral Degree  
Authorization Center

### Industrial Engineering

Provincial First-class Major and Applying for a National  
First-class One





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## FIRST-CLASS STUDENTS

**2242**

**Student  
Enrollment**

**1196**

Undergraduates

**697**

Master's  
students

**349**

Doctoral  
students

**117**

International  
student

Over the past 113 years, more than 15,000 graduates have been put into all sections of our economy, most of whom have grown into the backbone of their respective professions.



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## **DISCIPLINE DEVELOPMENT PLANNING**

**First-class Discipline**

**The 14th-five-year Planning**

**Double First-class Construction**

**Short-term Planning (2021~2025)**

### **1st Area: Green Mining**

Task 1: Coal-based Solid Waste Disposal and Resource utilization  
Task 2: Underground Environment Protection and Treatment  
Task 3: Mine Green Functional Materials

### **2nd Area: Deep Development**

Task 4: Dynamic Disaster Monitoring, Early Warning and Prevention and Control Technology  
Task 5: Theory and Method of Surrounding Rock Control in Deep Roadway

**Medium-term Planning (2021~2030)**

### **3rd Area: Intelligent Mine**

Task 6: Theory and Technology of Intelligent Tunneling

Task 7: Mine Intelligent Low-carbon Mining

**Long-term Planning (2021~2035)**

### **4th Area: Future Mining**

Task 8: Collaborative Development of Mine Geothermal and Coal

Task 9: Fluidized Mining of Deep Solid Minerals



**THANKS FOR YOUR WATCHING**

