# 岩土力学与工程前沿讲坛

## Forum on Geomechanics and Geo-engineering

No.SKL*2020-15*

应武汉岩土所岩土力学与工程国家重点实验室邀请，美国麻省大学阿姆赫斯特分校张国平教授开设线上系列学术讲座，信息如下：

| | |
|---|---|
| 报告人<br>Lecturer | **张国平 教授** |
| 报告题目<br>Theme | **工程粘土矿物学（中文 20 讲）** |
| 报告时间<br>Time | **2020 年 12 月 1 日至 2021 年 1 月 14 日** |
| 报告地点<br>Spot | 腾讯会议平台（无密码登陆） |

欢迎广大科研人员及研究生参加！

# 岩土力学与工程前沿讲坛

## Forum on Geomechanics and Geo-engineering

## 报告人介绍

**Guoping Zhang** is currently a professor in the Department of Civil & Environmental Engineering at the University of Massachusetts Amherst. He obtained a PhD in Geotechnical Engineering with a minor degree in Materials Science and Engineering from MIT in 2002. His research is centered on clay-based and clay-derived materials, including clay minerals, clay-biopolymer aggregates and flocs, shales, geopolymers, and superhydrophobic materials, as well as their property (mainly mechanical) characterization and applications, with funding from a variety of federal, state, and industrial sponsors.

## 讲座内容与安排

---

**第 1 讲** (12 月 1 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Introduction***

Course syllabus & conduct

Origin and importance of this course

Motivation

**第 2 讲** (12 月 3 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Clay mineralogy: definition, classification, and examples***

Definition, basic concepts

Occurrence and formation

**第 3 讲** (12 月 4 日，上午 9:00-11:00，腾讯会议号：95325695070)**:**

***Clay mineralogy: definition, classification, and examples***

Occurrence and formation

Classification

**第 4 讲** (12 月 8 日，上午 9:00-11:00，腾讯会议号：79693419965)**:**

***Clay mineralogy: definition, classification, and examples***

Size and micromorphology

Crystal structure, composition, defect and disorder

**第 5 讲** (12 月 10 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Clay mineralogy: definition, classification, and examples***

Crystal structure, composition, defect and disorder

Common and special clay minerals

**第 6 讲** (12 月 11 日，上午 9:00-11:00，腾讯会议号：95325695070):

***Identification, quantification, and analysis***

X-ray diffraction and Braggs Law

Sample preparation and chemical treatment

**第 7 讲** (12 月 15 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Identification, quantification, and analysis***

Quantification and data interpretation

Scanning electron microscopy

**第 8 讲** (12 月 17 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Identification, quantification, and analysis***

Atomic force microscopy

Thermal analysis

**第 9 讲** (12 月 18 日，上午 9:00-11:00，腾讯会议号：95325695070):

***Identification, quantification, and analysis***

2D X-ray diffraction

Small-angle X-ray scattering

**第 10 讲** (12 月 22 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Surface properties and clay-water interactions***

Surface charges, basic interfacial and surface forces

Cation exchange, swelling, intercalation and organic solvation

**第 11 讲** (12 月 24 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Surface properties and clay-water interactions***

Cation exchange, swelling, intercalation and organic solvation

Clay-water-ion interactions: adsorption, absorption, and bonding mechanisms

**第 12 讲** (12 月 25 日，上午 9:00-11:00，腾讯会议号：95325695070):

***Surface properties and clay-water interactions***

Clay-water-ion interactions: adsorption, absorption, and bonding mechanisms

Solubility and ion exchange

**第 13 讲** (12 月 29 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Surface properties and clay-water interactions***

Solubility and ion exchange

**第 14 讲** (12 月 31 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Introduction of Molecular Dynamics Simulations***

Basic Newton’s Laws

Atomic structural models

**第 15 讲** (1 月 1 日，上午 9:00-11:00，腾讯会议号：95325695070):

***Introduction of Molecular Dynamics Simulations***

Atomic structural models

Interatomic forces and bonds

**第 16 讲** (1 月 5 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Introduction of Molecular Dynamics Simulations***

Interatomic forces and bonds

Force fields

**第 17 讲** (1 月 7 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Introduction of Molecular Dynamics Simulations***

Force fields

Common MD simulation platforms: LAMMPS, Materials Studio, GROMACS

**第 18 讲** (1 月 8 日，上午 9:00-11:00，腾讯会议号：95325695070):

***Introduction of Molecular Dynamics Simulations***

Common MD simulation platforms: LAMMPS, Materials Studio, GROMACS

Output analysis and visualization

**第 19 讲** (1 月 12 日，上午 9:00-11:00，腾讯会议号：79693419965):

***Introduction to Profex for diffraction data***

Qualitative analysis

**第 20 讲** (1 月 14 日，晚上 20:30-22:30，腾讯会议号：54947181356):

***Introduction to Profex for diffraction data***

Quantitative analysis