



## **NATO CCMS Pilot Study Meeting**

**Prevention and Remediation In Selected Industrial Sectors:  
Small Sites in Urban Areas**

# **Current Research Topics**

**Dr. Anthimos Xenidis**

**Lab. of Metallurgy**

**National Technical University of Athens (NTUA)**



# *Contents*

- Short presentation of NTUA
- Short presentation of Lab. of Metallurgy
- Current and completed research projects



# National Technical University of Athens (NTUA)

- NTUA is the **oldest** and most **prestigious** educational institution of Greece in the field of **technology**
- It was **founded** in 1836
- It contributed to the country's scientific, technical and economic development
- It is closely linked with Greece's struggle for independence, democracy and social progress



# National Technical University of Athens (NTUA)

- 8 Engineering schools, around 7 000 students
  - ✓ Civil Engineering
  - ✓ Mechanical Engineering
  - ✓ Electrical and Computer Engineering
  - ✓ Architecture Engineering
  - ✓ Chemical Engineering
  - ✓ Rural and Surveying Engineering
  - ✓ ***Mining and Metallurgical Engineering***
  - ✓ Naval Architecture and Marine Engineering
- Research is carried out in about 100 laboratories
- Patission street complex and Zografou Campus



# National Technical University of Athens (NTUA)



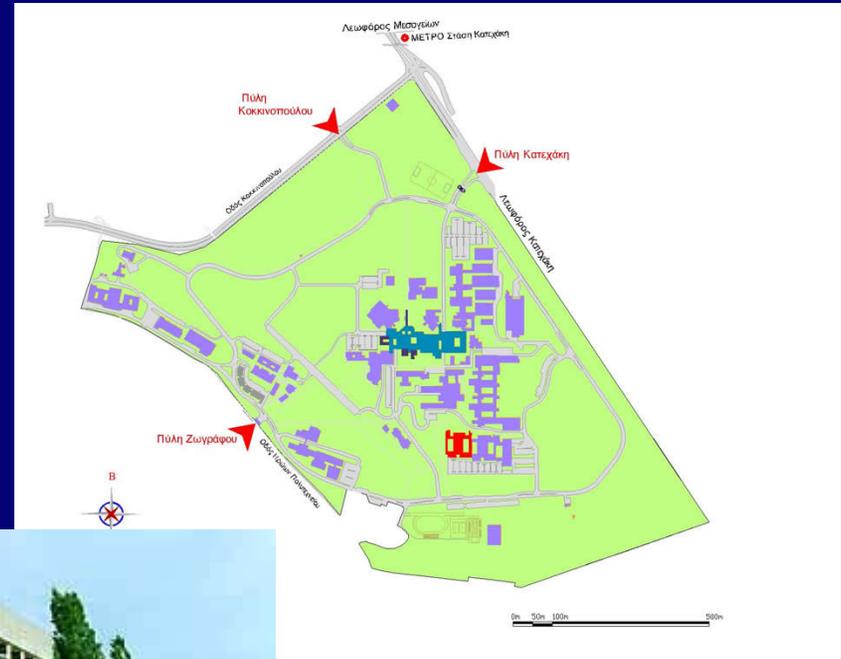
## The Patisson Complex





# National Technical University of Athens (NTUA)

## Zografou Campus





# National Technical University of Athens (NTUA)

## ➤ **Laboratory of Metallurgy**

- ✓ **School of Mining Engineering and Metallurgy**
- ✓ **Participated in a number of national and EC funded projects**
  - ✧ **Extractive metallurgy**
  - ✧ **Environmental problems usually associated with mining, mineral processing and extractive metallurgy activities**



# Lab of Metallurgy - Research Activities

## Material Processing

- \* **Hydrothermal synthesis of materials**
- \* **Industrial material processing**
- \* **Waste processing**
- \* **Hydrometallurgy**
- \* **Pyrometallurgy**

## Environment

- \* **Characterisation - Risk assessment**
- \* **Waste treatment and disposal**
- \* **Soil and groundwater pollution**

## Life Cycle Assessment (LCA)

## Modelling - Simulation

- \* **Production process modeling**
- \* **Computer simulation of production processes**

## Networks

- \* **EUROTHEN**
- \* **OSNET**



# *Selected research projects*

## Soil and groundwater pollution

- Soil remediation in the municipality of Lavrion (LIFE, completed)
- Innovative industrial technologies for the rehabilitation of land contaminated from polymetallic sulphide mining and processing operations (ROLCOSMOS, completed)
- Development of technologies using the activity of sulphate and metal reducing bacteria to remove heavy metals and metalloids from groundwater and soils (METALBIOREDUCTION, completed)
- Rehabilitation of soil with bio-hydrometallurgical methods (PYTHAGORAS II, ongoing)
- Long-term Performance of Permeable Reactive Barriers used for the Remediation of Contaminated Groundwater (PEREBAR, completed)
- Integrated treatment of industrial wastes towards prevention of regional water resources contamination (INTREAT, on-going)



# *Selected related projects*

## Waste treatment/management

- Marine pollution in the Black Sea due to mining activities: risk assessment, development of preventive and remedial action (COPERNICUS, completed)
- Life cycle assessment of mining projects for waste minimisation and long term control of rehabilitated sites (LICYMIN, completed)
- Prediction, protective and remedial action against acid mine drainage (PRAMID)
- Development and application of low cost engineered barriers for the environmental safe disposal of sulphidic mine wastes (GEOPEDA, comp.)
- Development of a vegetation cover on alumina red mud depositions (AXERIL, compl.)



# *Selected related projects*

## Waste treatment/management/reuse

- Rehabilitation of abandoned bauxite surface mines using alumina red mud as filler (LIFE, ongoing)
- Use of bauxite residues for carbon sequestration (DEDIA, on-going)
- Hard pan formation in sulphidic wastes (PYTHAGORAS II, on-going)
- Iron and steel production from bauxite residues (PAVET, on-going)
- Sustainable Improvement in Safety of Tailings Facilities (TAILSAFE, compl.)
- The Treatment of Mine Waste to Achieve Cost Effective Engineered Closure of Tailings Dams (CLOTADAM, compl.)

# **The Lavrion Case Study**

**Presentation will be given by  
Dr. Alecos Demetriades**