

More than mining – Engine for Progress

Welcome to the online presence of the **Institute for Advanced Mining Technologies (AMT)** at RWTH Aachen University.

The AMT is part of the **Faculty of Georesources and Materials Engineering** at the RWTH Aachen and belongs to the **Division of Mineral Resources and Raw Materials Engineering (FRE)**.

In research and teaching, the AMT stands for a **safe, efficient and responsible supply of raw materials** through the **automation and digitization of mining machines and processes** and is one of the leading institutes in this field. For example, the term "Mining 4.0" was coined by AMT scientists and introduced into the international discourse.

A sustainable supply of raw materials is a direct **prerequisite for all technological developments** and is of great strategic importance for Europe. A large number of different raw materials are used in the manufacture of modern high-tech products. For example, a smart phone contains over thirty different elements of the periodic table. Various raw materials are required for the development of new composite materials, e.g. in lightweight construction or in medical technology, but also for the implementation of the energy revolution, from electric cars to wind turbines to solar cells. It is precisely the combination of different raw materials that is decisive for optimizing their properties. The basis for this, however, is the extraction of raw materials.

Mining operations are **large industrial plants of high complexity**. On the one hand, every geological deposit of raw materials is unique, which is why no mining operation is completely like another. On the other hand, there are very different geographical and economic boundary conditions in mining, unlike in regular production and manufacturing. Not only does mining extend geographically from the desert to the Arctic, from open pit mining to 3500 m deep mining, but the degrees of mechanization also vary considerably from artisanal small-scale mining to highly automated and partially autonomous operations.

The Institute for Advanced Mining Technologies is dedicated to this challenging environment. By pointing the way from traditional mining to digitization and computerization to advanced mining technologies as a guiding vision for research and teaching, the Institute for Advanced Mining Technologies **contributes to the sustainable safeguarding of technological progress for society as a whole**. Finally yet importantly, the research and technologies developed at the institute are high-tech and range from sensors that function like sensory organs to underground robotics - for a future-oriented mining industry!

