GEO DICT
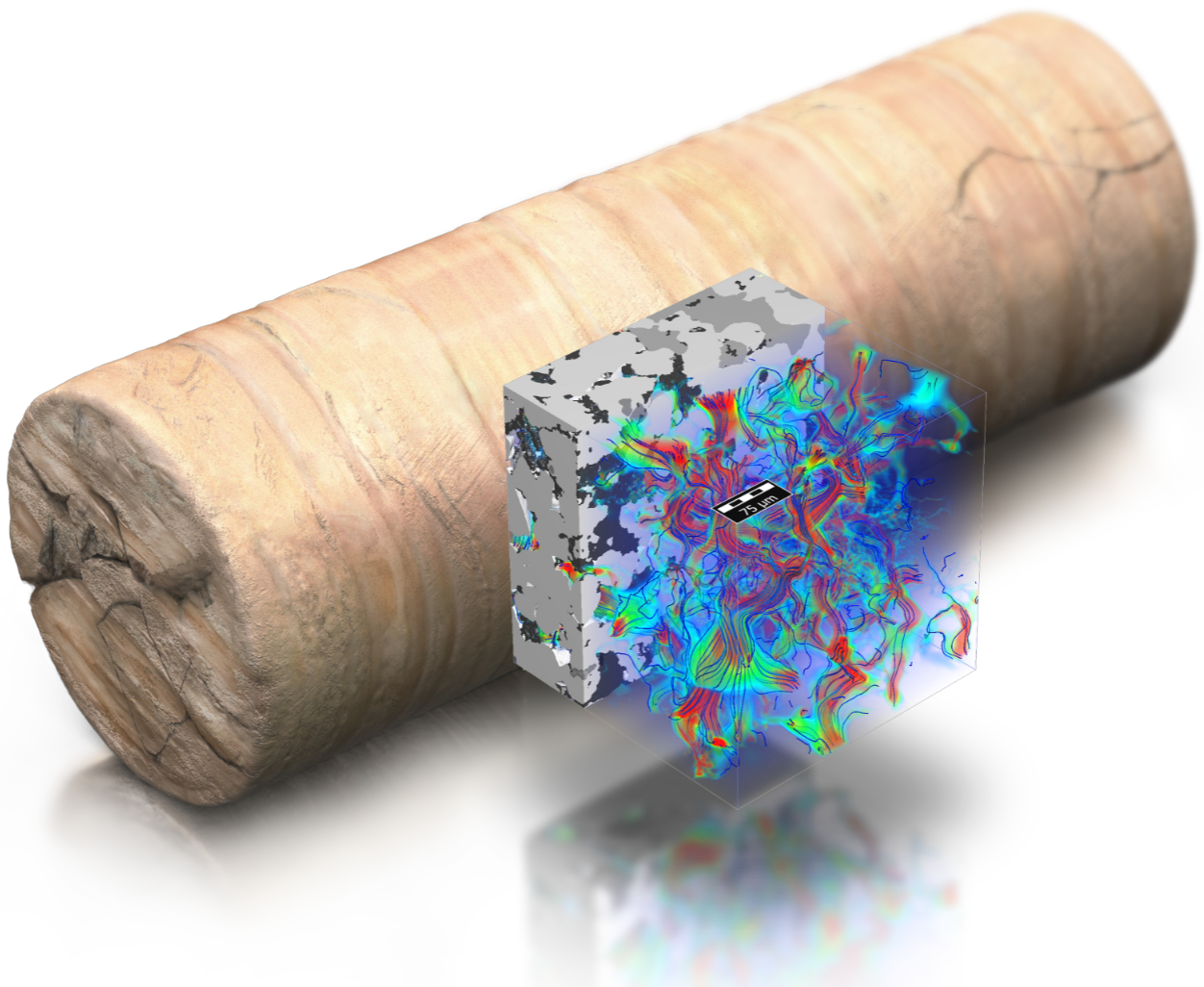
The Digital Material Laboratory

THE MOTIVATION

Studying rock physics aims to understand how rocks' physical properties impact various geosciences and engineering applications, such as hydrocarbon exploration, geothermal energy, and environmental monitoring. By analyzing how rocks respond in different environments, researchers can develop more accurate models and increase efficiency.

OUR SOLUTION

GeoDict's non-destructive approach to Digital Rock Physics allows researchers to create 3D digital models of rocks and simulate physical processes, including insights into the effects of local changes. GeoDict provides a quick and efficient solution for analyzing the physical properties of rocks in a wide range of geosciences and engineering applications, offering early decision-making results through fast simulations.

YOUR BENEFIT

GeoDict offers a solution for the Oil and Gas industry to analyze and predict main rock properties cost-efficiently. Its 3D digital models and simulations provide valuable insights into hydrocarbon reservoirs, leading to improved efficiency and better business outcomes. GeoDict's non-destructive approach saves time and resources, while its relieable and fast simulations allow for more informed decision making.
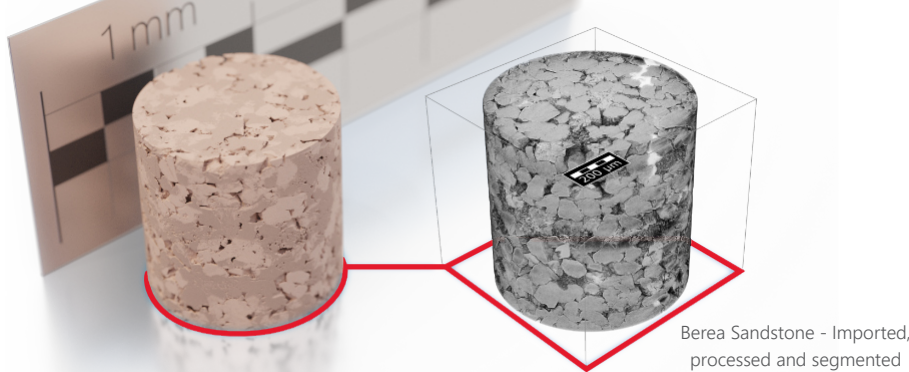
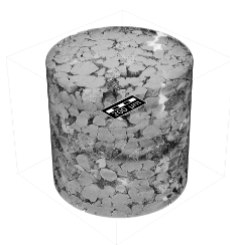Berea Sandstone - Imported, processed and segmented

Digitalization

Create a rock sample's digital twin for simulations and analyses by importing and segmenting its 3D images - from various methods like µCT and FIB-SEM - with GeoDict's advanced image filters and AI tools.
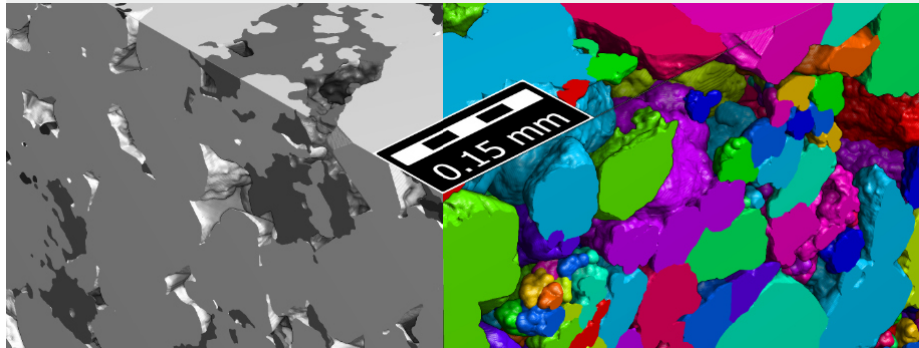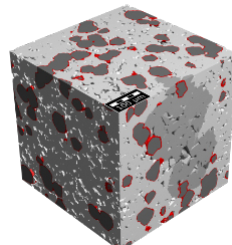

Material Analysis

Use AI to automatically detect and characterize grains and pores, identify connectivity and percolation pathways, and precisely measure porosity, size distribution, surface area, and tortuosity in material analysis.

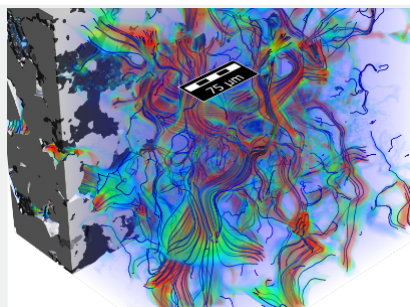Imported Berea Sandstone   Imported Carbonate   Generated Rock Model

Microstructure Design

Utilize GrainGeo to create realistic and customizable digital models of rocks, and ImportGeo to import and segment 3D images of real and artificial rock samples.

Fluid Flow Simulations:

- Absolute and relative permeability
- Multi-scale and multi-phase flow
- Capillary pressure curve (incl. MICP)
- Reactive flow
- CO2-sequestration

Electrical Rock Properties:

- Formation factor
- Resistivity index (incl. Thin Water Films)
- Saturation exponent
- Cementation exponent

Rock Mechanics:

- Elastic moduli
- Stiffness
- In-situ conditions
- Rock Fractures
- Material damage
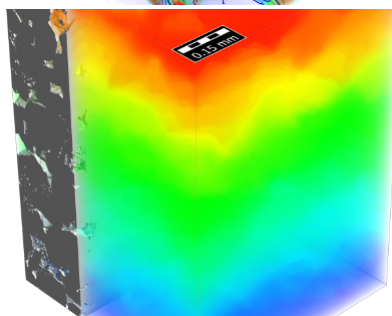- P-T reservoir conditions
- Poroelasticity

Property Prediction

Predict the properties of rocks with GeoDict's modules for property prediction. Accurately model fluid flow, electrical properties, and rock mechanics to gain insights into the behavior of rocks under various conditions. This information is crucial for industries such as oil and gas, geothermal energy, and environmental monitoring, where accurate predictions are essential for efficient and effective operations.

MATH 2 MARKET