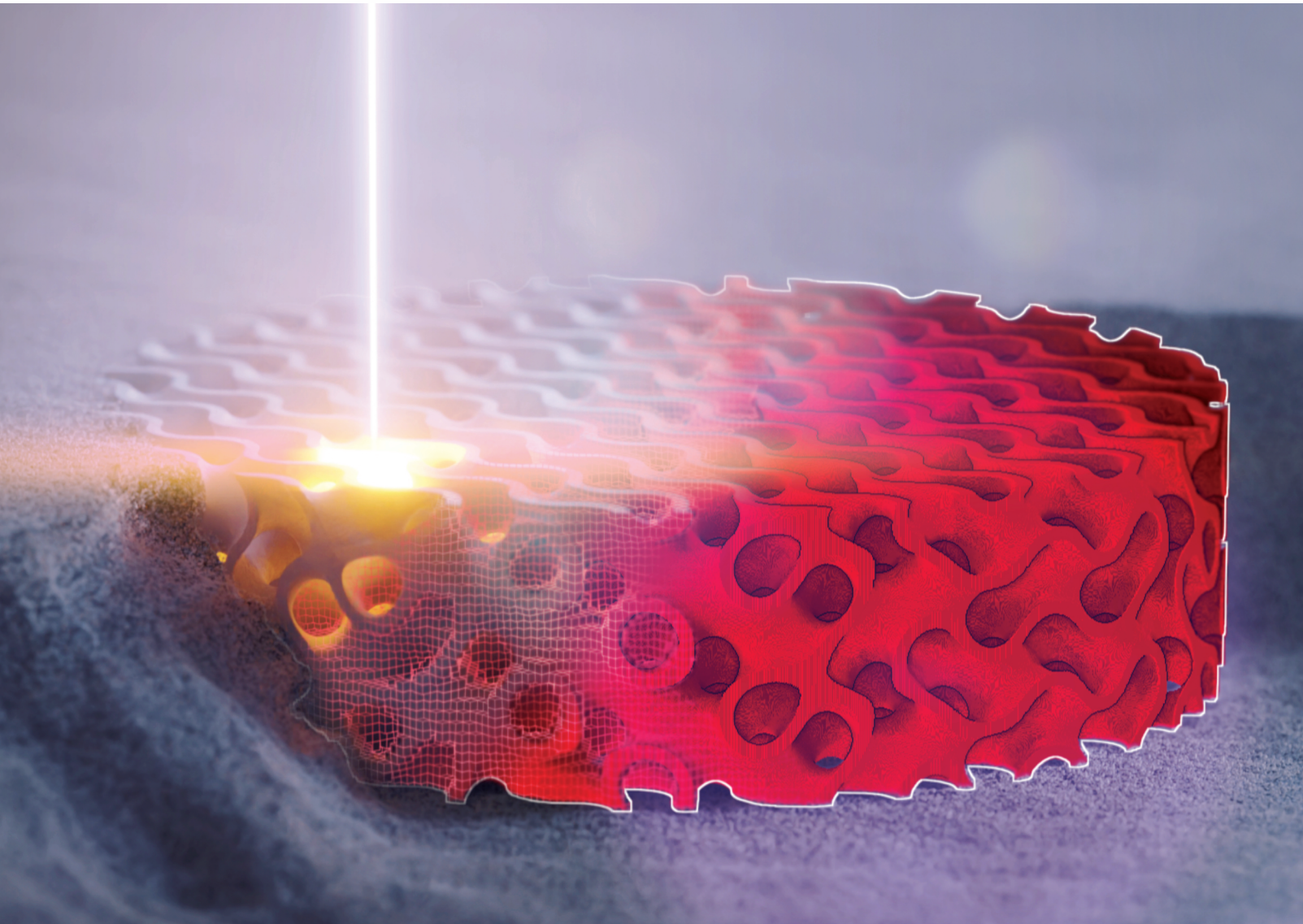


# GEO DICT

The Digital Material Laboratory

**ADDITIVE  
MANUFACTURING**

**TRIPLY PERIODIC  
MINIMAL SURFACES**



## THE MOTIVATION

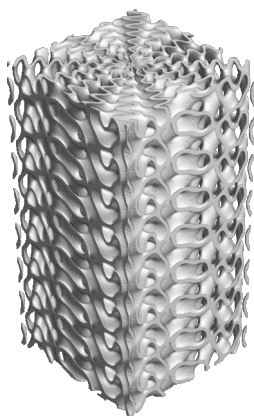
Additive manufacturing (AM) has revolutionized manufacturing with benefits like cost-effectiveness and rapid prototyping. In many cases triply periodic minimal surfaces are favored for their large surface area and continuous pathways for fluid flow. However, manufacturers face challenges in designing these structures due to the complex underlying mathematical concepts, the optimization for specific functions and the material selection.

## OUR SOLUTION

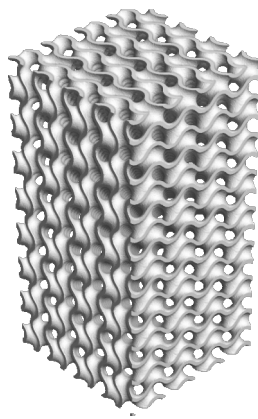
GeoDict is capable of determining the physical properties of triple periodic minimal structures, such as stiffness tensors, electrical and thermal conductivity. By importing  $\mu$ CT scans, it allows the creation of digital twins and the modeling of comparable structures. Moreover, GeoDict can simulate saturation and flow processes, as well as predict mechanical behaviors under various loads.

## YOUR BENEFIT

Utilizing GeoDict optimizes your material development workflow by speeding up development cycles, enhancing material quality, and reducing costs. Its ability to provide insights into material properties and predict behaviors under various loads contributes to a quicker time-to-market. In the realm of Additive Manufacturing technologies and applications, GeoDict is an indispensable tool for facilitating progress.



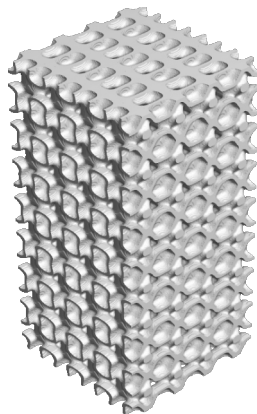
Cylindrical Gyroid



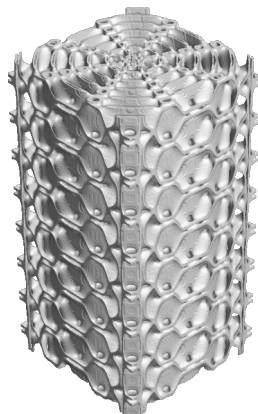
Square Gyroid



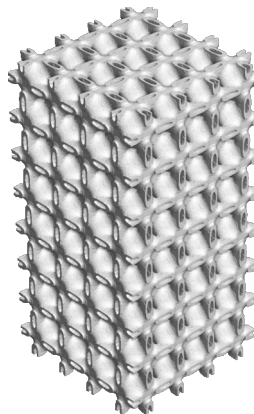
Cylindrical I-WP



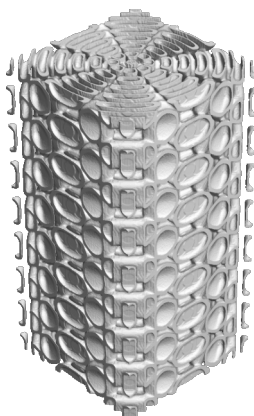
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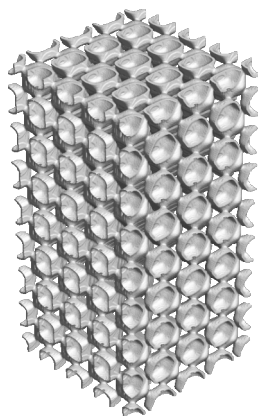
Cylindrical Neovius



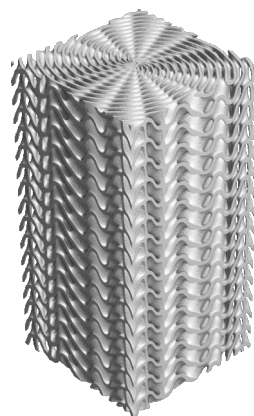
Square Neovius



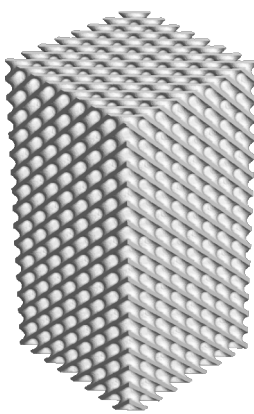
Cylindrical P-W



Square P-W



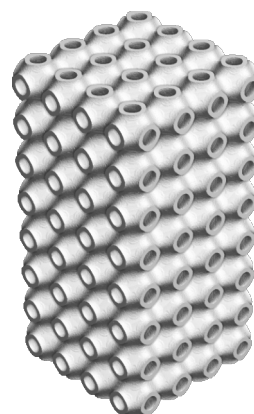
Cylindrical Schwarz-Diamond



Square Schwarz-Diamond



Cylindrical Schwarz-Primitive



Square Schwarz-Primitive

## DIGITALIZATION

GeoDict introduces a state-of-the-art simulation software tailored for additive manufacturing research. It enables precise 3D modelling, simulation and design optimization of structures and digital twins.

## MATERIAL ANALYSIS

Use GeoDict to determine physical properties, such as permeability, tortuosity, and electrical and thermal conductivity. Simulate the flow and saturation processes, predict the stiffness tensor and conduct digital parameter studies.

## MICROSTRUCTURE DESIGN

With GeoDict's capabilities, explore a world of unhindered scientific creativity, delving into intricate geometries and structures that were constrained by traditional manufacturing before.

## PROPERTY PREDICTION

Harness the power of digital analysis and property determination, bypassing time-consuming and costly benchmarking processes. Embrace data-driven decision-making for designing and optimizing material structures.