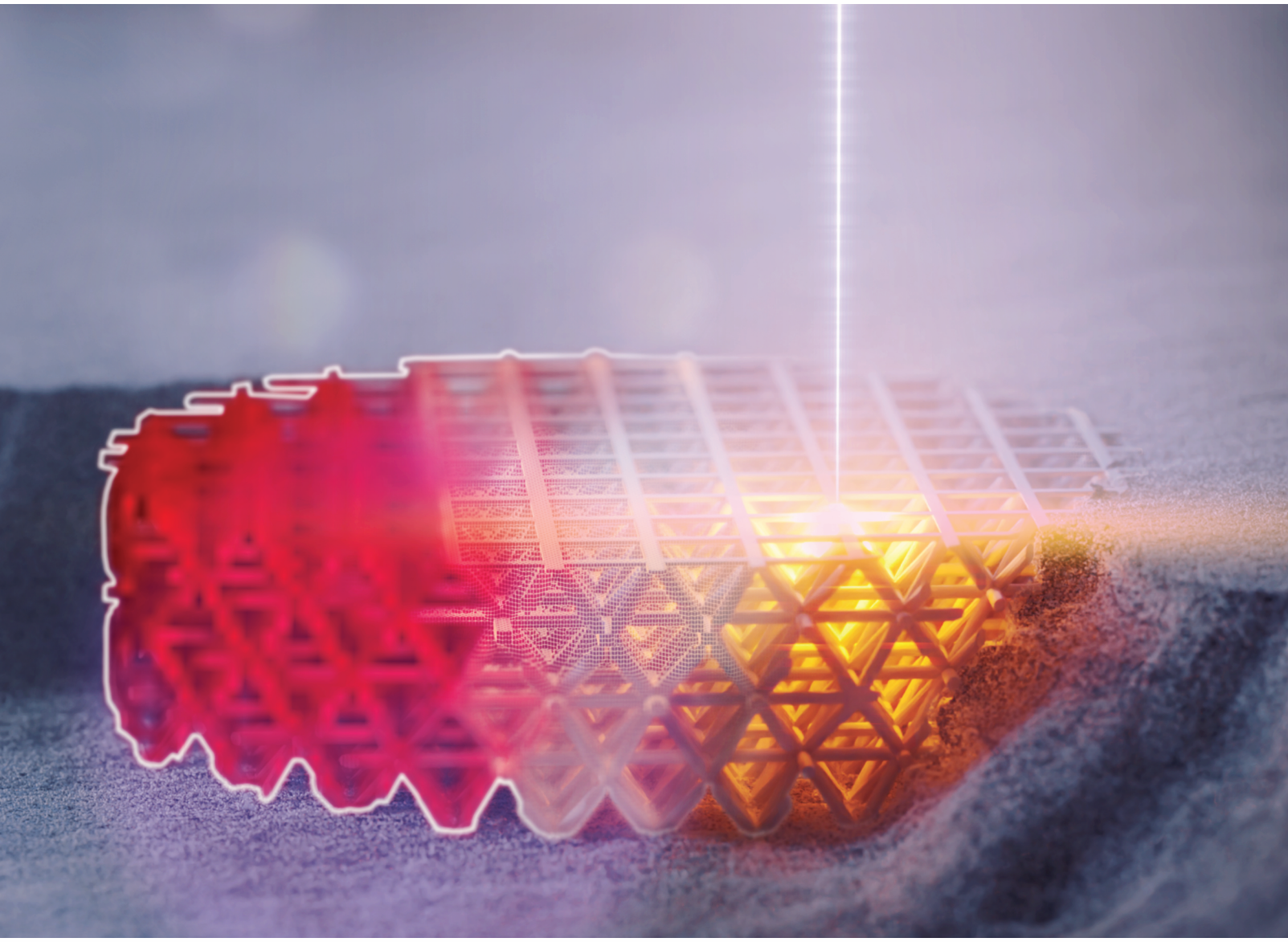
GeoDict

The Digital Material Laboratory

Additive Manufacturing

Strut Based Lattices



The Motivation

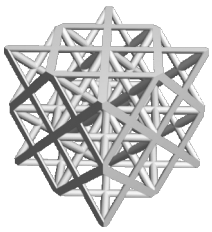
Additive manufacturing (AM) has revolutionized manufacturing with benefits like cost-effectiveness and rapid prototyping. In many cases strut-based lattices are favored for their high strength-to-weight ratio. However, manufacturers face challenges in designing these structures to balance weight, strength, cost, and material properties while predicting performance under different loads.

Our Solution

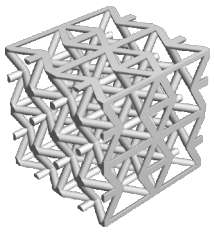
GeoDict is capable to determine physical properties of strut-based lattices, such as stiffness tensors, electrical and thermal conductivity. By importing µCT scans, it allows the creation of digital twins and the modeling of comparable structures. Moreover, GeoDict can simulate saturation and flow processes, as well as predict mechanical behaviors under various loads.

Your Benefit

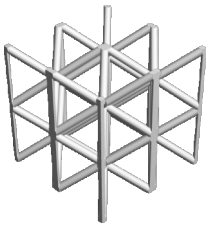
Utilizing GeoDict optimizes your material development workflow by speeding up development cycles, enhancing material quality, and reducing costs. Its ability to provide insights into material properties and predict behaviors under various loads contributes to a quicker time-to-market. In the realm of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



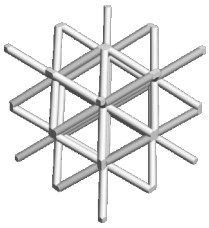
All-Face-Centered-Cubic-(AFCC)



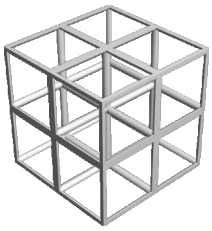
Auxetic



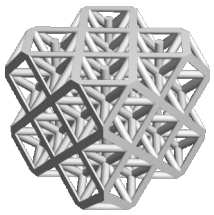
BCC-with-Z-Strut-(BCCZ)



Body-Centered-Cubic-(BCC)

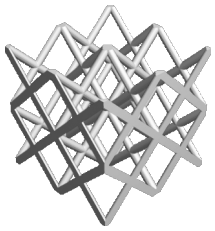


Cubic

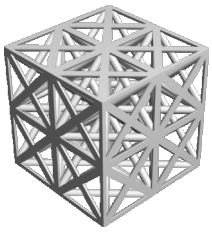


Cuboctahedron-Z

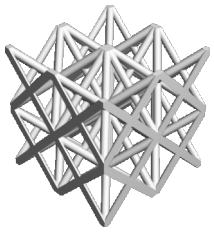
Diamond-(Penta-Mode)



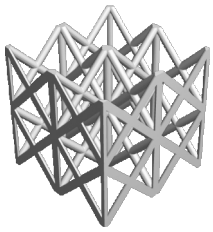
Face-Centered-Cubic-(FCC)



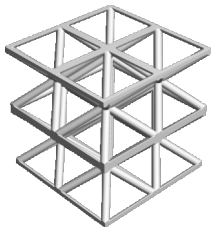
FBCCZ-with-X-Strut-and-Y-Strut-(FBCCXYZ)



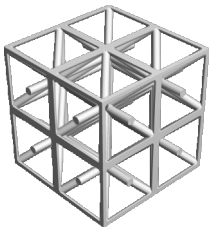
FCC-plus-BCCZ-(FBCCZ)



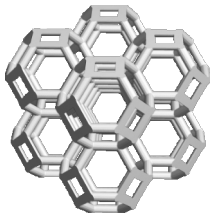
FCC-with-Z-Strut-(FCCZ)



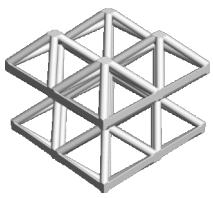
G7



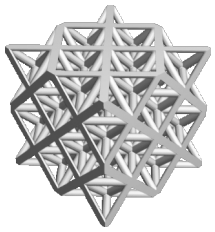
Iso-Truss



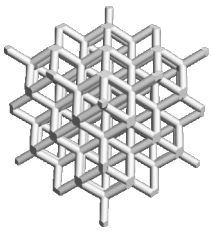
Kelvin



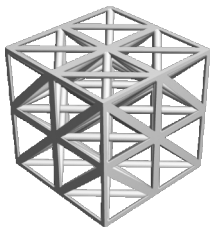
Octahedron



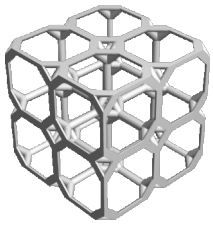
Octett-Truss



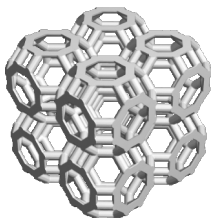
Rhombic-Dodecahedron



Tetrahedron-Based



Truncated-Cube



Truncated-Cuboctahedron

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.

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