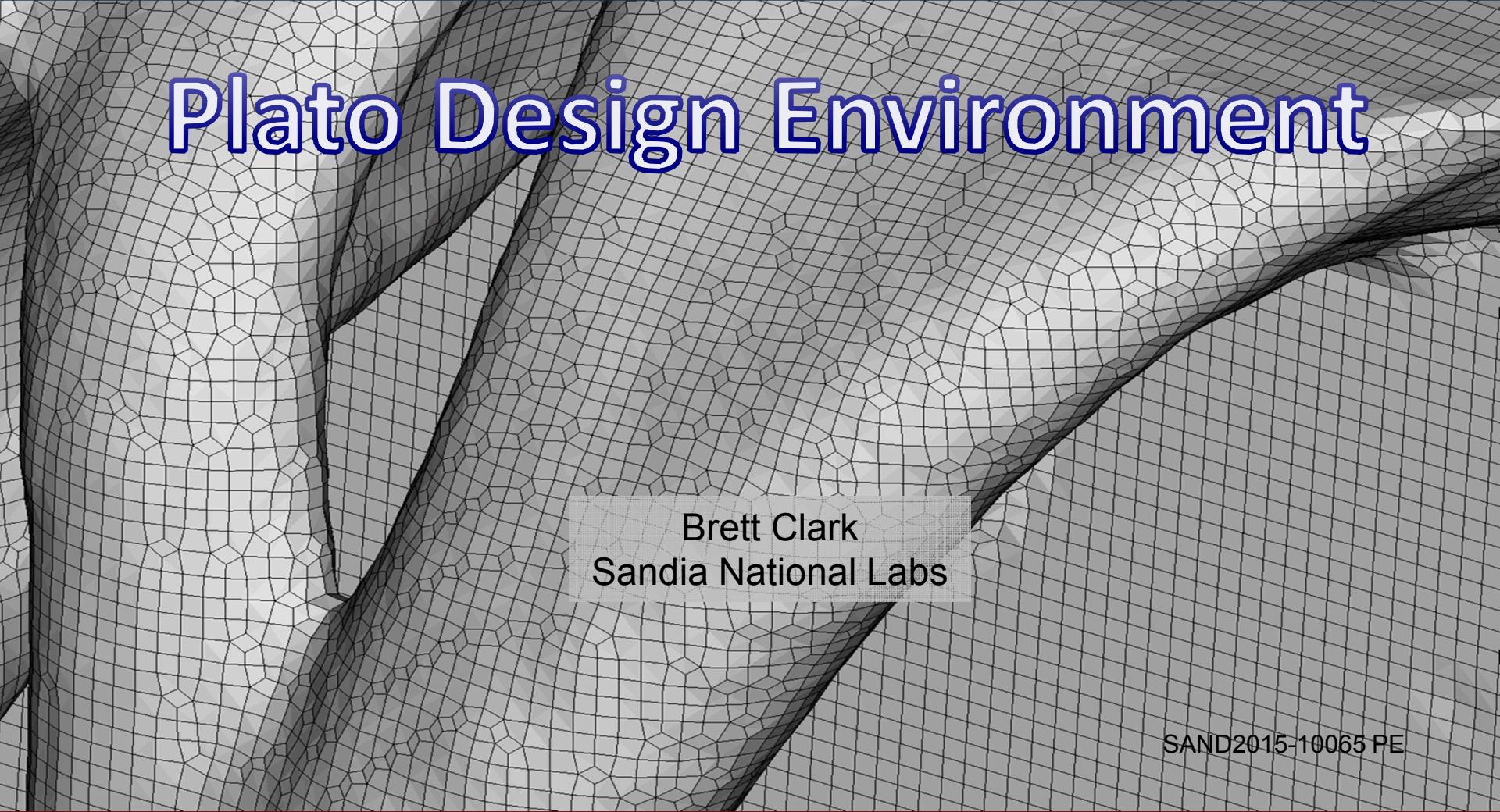


Exceptional service in the national interest



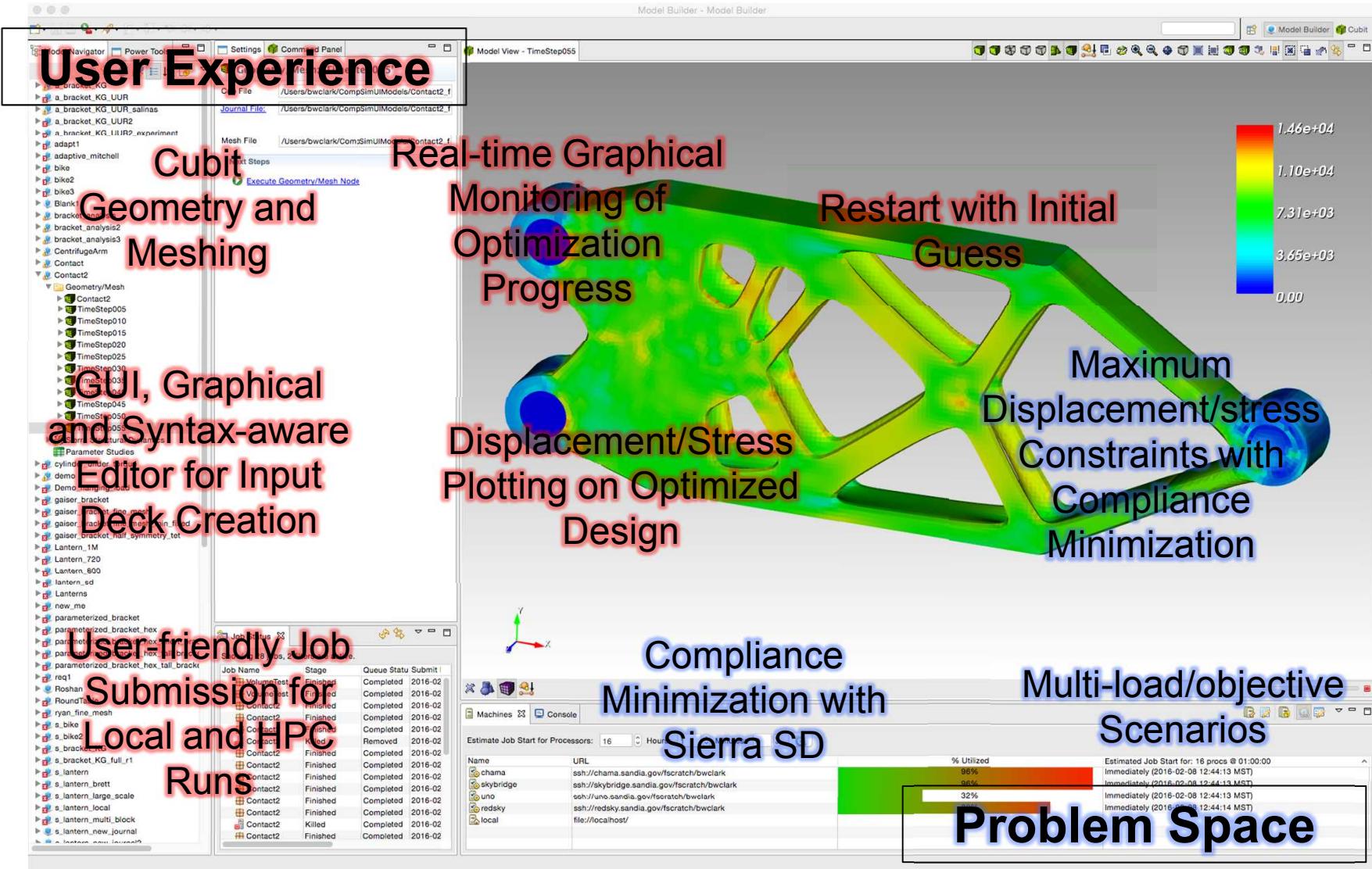
Plato Design Environment

A large, complex, gray wireframe mesh representing a 3D model, possibly a aircraft or vehicle, is visible in the background, occupying most of the slide.

Brett Clark
Sandia National Labs

SAND2015-10065 PE

Plato 1.0



User Experience

Cubit

Geometry and Meshing

GUI, Graphical and Syntax-aware Editor for Input Deck Creation

User-friendly Job Submission for Local and HPC Runs

Real-time Graphical Monitoring of Optimization Progress

Displacement/Stress Plotting on Optimized Design

Restart with Initial Guess

Maximum Displacement/stress Constraints with Compliance Minimization

Compliance Minimization with Sierra SD

Multi-load/objective Scenarios

Problem Space

Real-time Example Run

Model Builder - DART-Hidden-Default-Project/LINKED_RESOURCES/Users/bwclarke/CompSimU/Models/RoundTableCoarseSalinas_files/simulation/RoundTableCoarseSalinas.i - Model Builder

Model Navigator

- Lantern_coarse
- lantern_sd
- Lantern
- new_me
- parameterized_bracket
- parameterized_bracket_hex
- parameterized_bracket_hex_short_bri
- parameterized_bracket_hex_tall_bri
- parameterized_bracket_hex_tall_brac
- req1
- Roshan
- RoundTable
- RoundTableCoarse
- RoundTableCoarseSalinas
- Geometry/Mesh
- Sierra Structural Dynamics
 - Boundary Conditions
 - Constraints
 - Contacts
 - Coordinates
 - Finite Element Model
 - Functions
 - Initial Conditions
 - Interactions
 - Loads
 - Materials
 - Mechanics
- Output
- Parameters
- Solution
 - Solution Control
 - Solvers
- Topology Optimization
- Simulation Job [idle]
- Parameter Studies

ryan_fine_mesh

s_bike

s_bike2

s_bracket_KG

s_bracket_KG_full_r1

s_lantern

s_lantern_brett

s_lantern_large_scale

s_lantern_local

s_lantern_multi_block

s_lantern_new_journal

s_lantern_new_journal2

s_lantern_symmetric

s_lantern_symmetric2

s_mitchell

s_mitchell_mesh_var1

sd_lantern_demo

test_mesh_variation

therm_mech

therm_mech_dup

toa10

toa3

toa4

toa5

toa6

tpd

TPD_with blends_albany

TPD_with blends_albany_no_restart

TPD_with blends_multi_albany

TPD_with blends_new_loading

tpd2

trv3

Command Panel

RoundTableCoarseSalinas on skybridge

Basic

Code: Salinas

Machine: skybridge

Job Stage: Subr

Queue Id / State: 691357

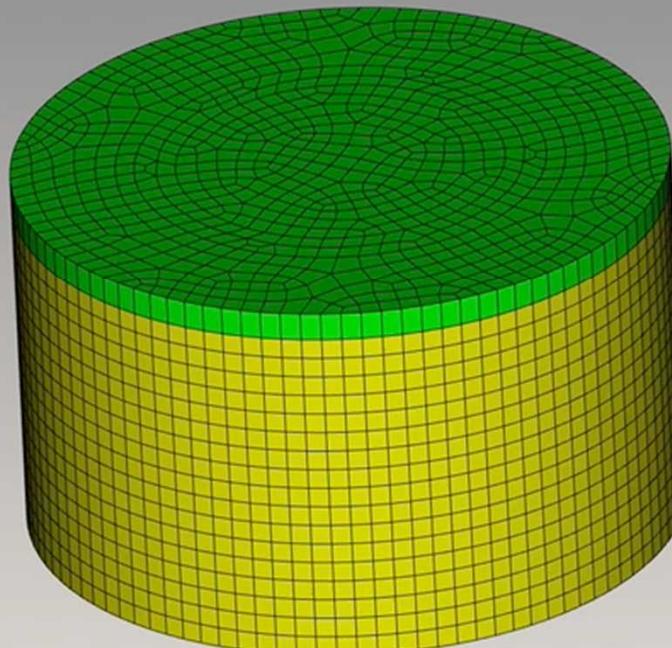
Submitted On: 2016-03

Account: FY14021

Requested Processors: 16

Requested Job Runtime: 30 minute

Model View - RoundTableCoarseSalinas



RoundTableCoarseSalinas.i

```
#####
volume_fraction = 0.25
output_frequency = 5
max_num_optimization_itr = 45
filter_type = kernel
filter_scale = 3
filter_iterations = 1
/// Optional command for blocks you don't want to be optimized.
```

Console

Machines

Job Status

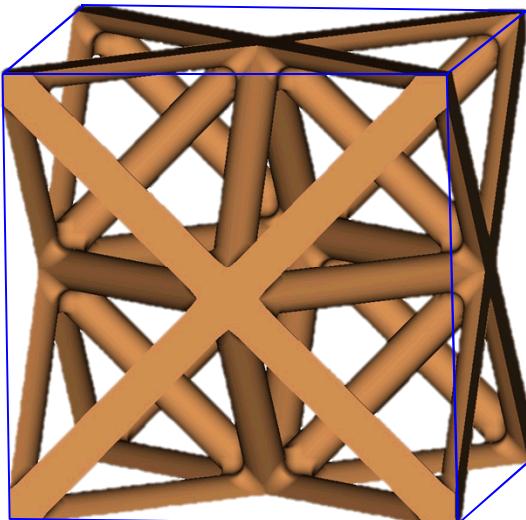
Showing 63 jobs, 2 filters are active.

Job Name	Stage	Queue Status	Submit Date	Machine	Job ID
RoundTableCoarseSalinas	Submitted	Idle	2016-03-10 16:35:50 MST	skybridge	691357
RoundTableCoarseSalinas	Killed	Removed	2016-03-10 16:25:55 MST	skybridge	691344
RoundTableCoarseSalinas	Killed	Removed	2016-03-10 16:23:17 MST	skybridge	691342
RoundTableCoarseSalinas	Finished	Completed	2016-03-10 16:21:34 MST	skybridge	691340
RoundTableCoarseSalinas	Finished	Completed	2016-03-10 16:17:56 MST	skybridge	691336

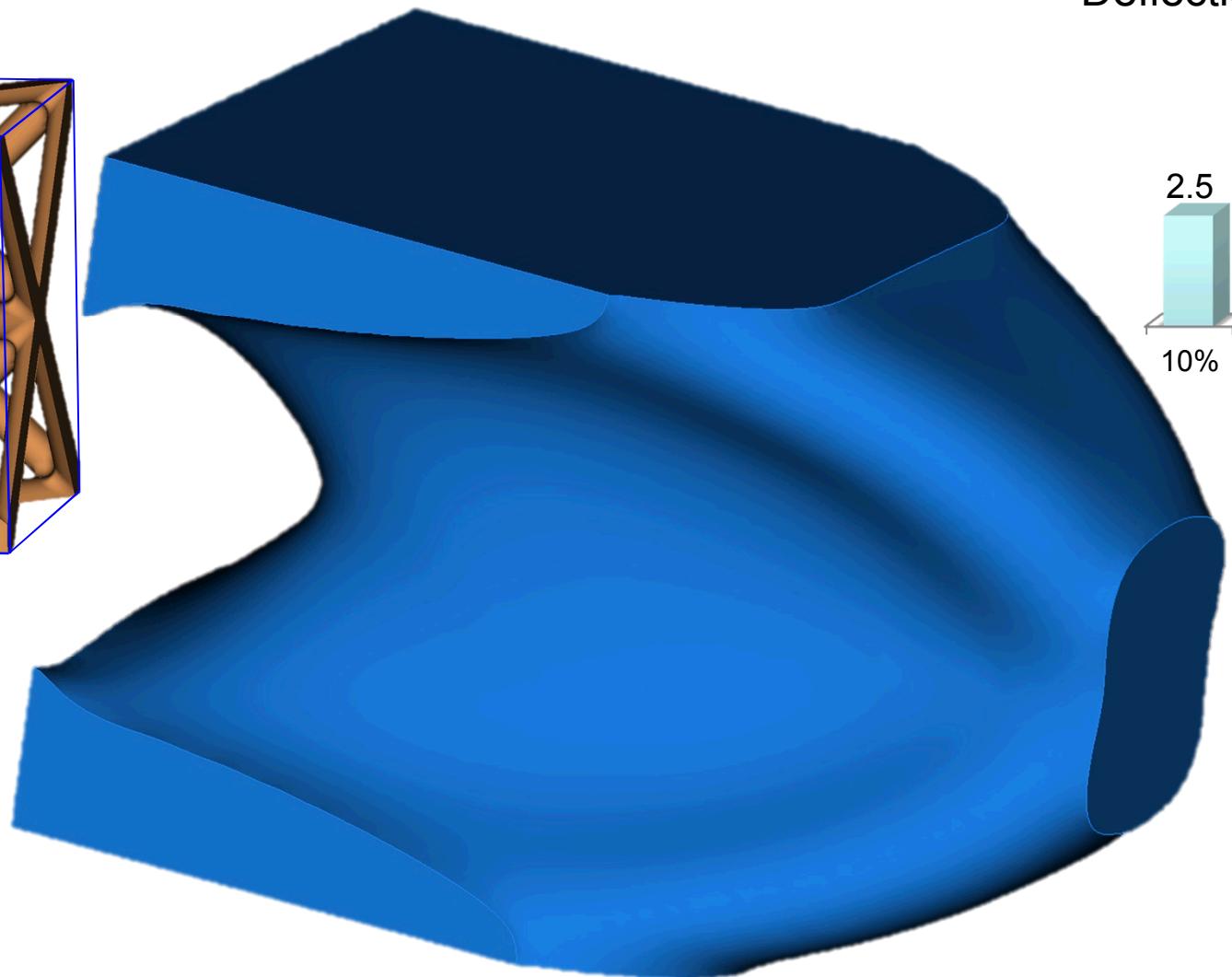
Running RoundTableCoarseSalinas

Meso Scale Lattice – Homogenized Continuum

10% Dense

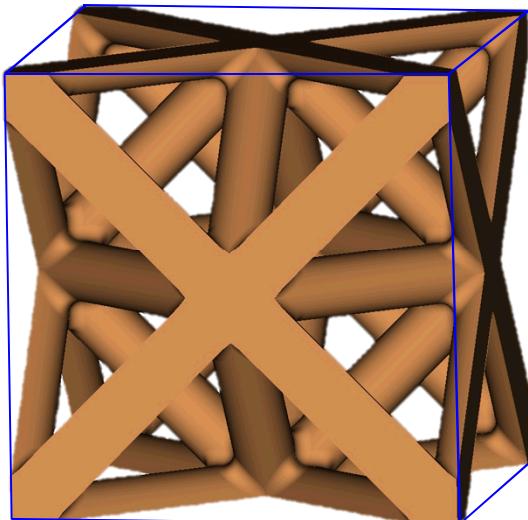


Deflection

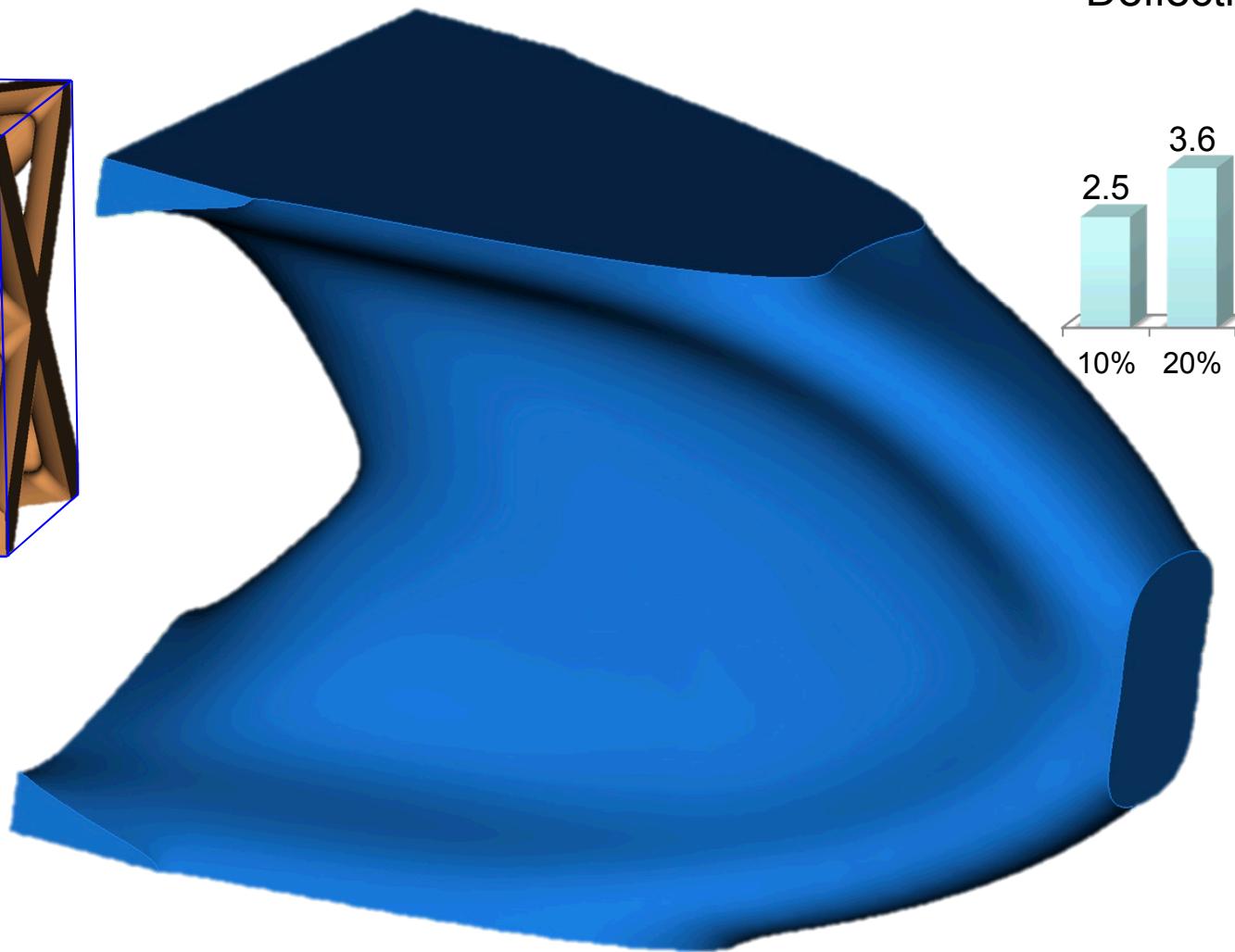


Meso Scale Lattice – Homogenized Continuum

20% Dense

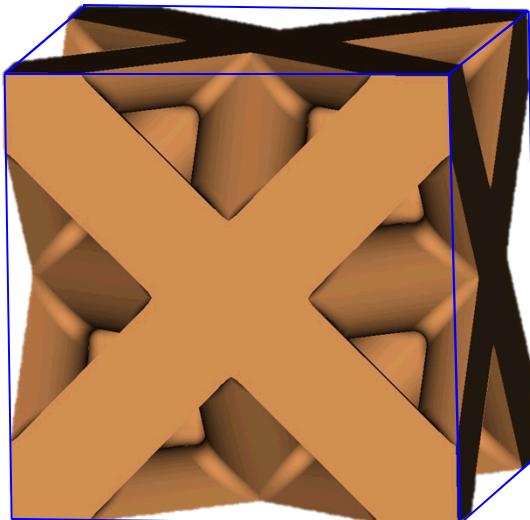


Deflection

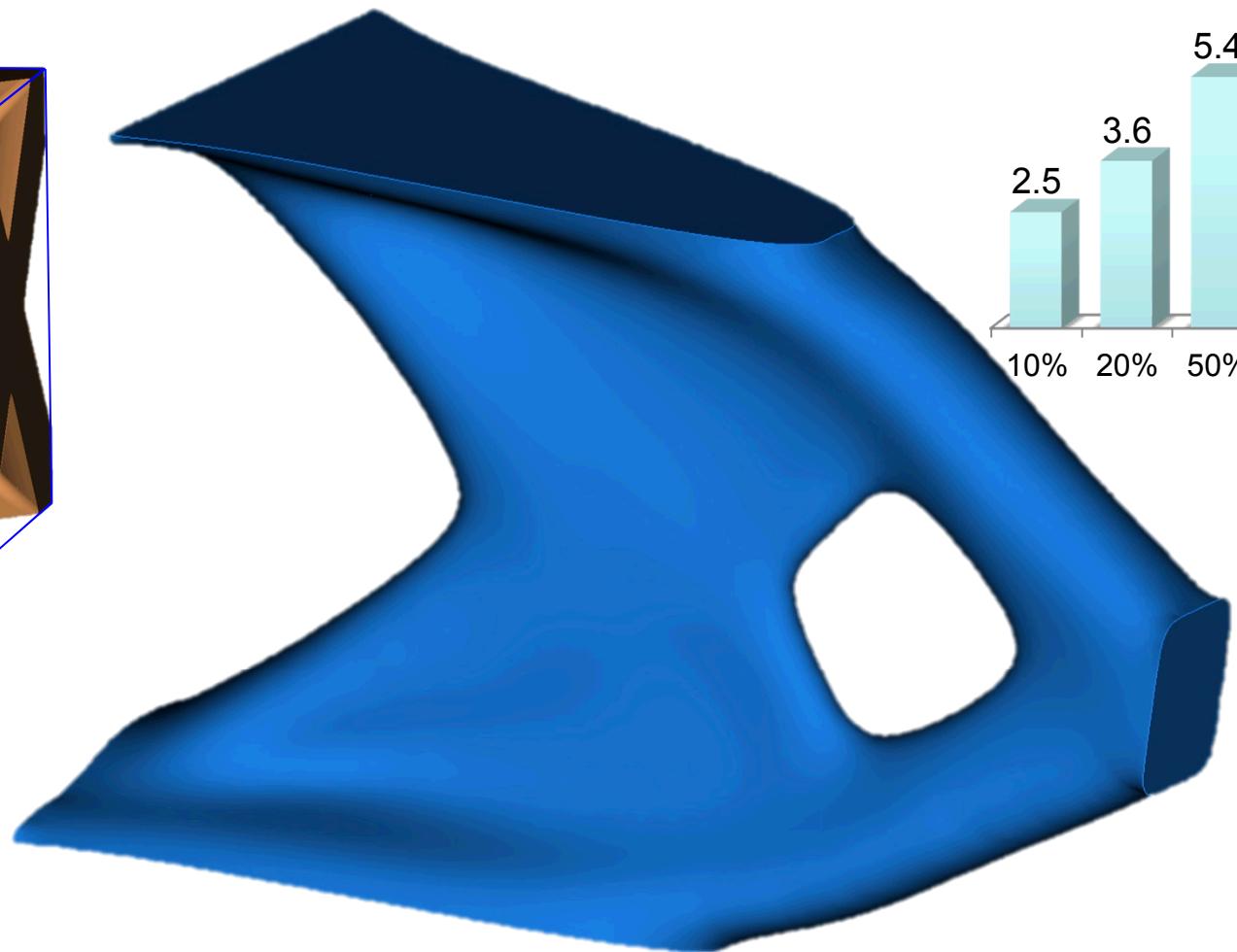
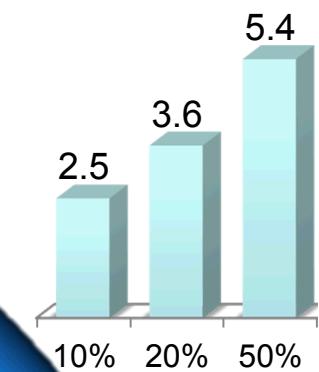


Meso Scale Lattice – Homogenized Continuum

50% Dense

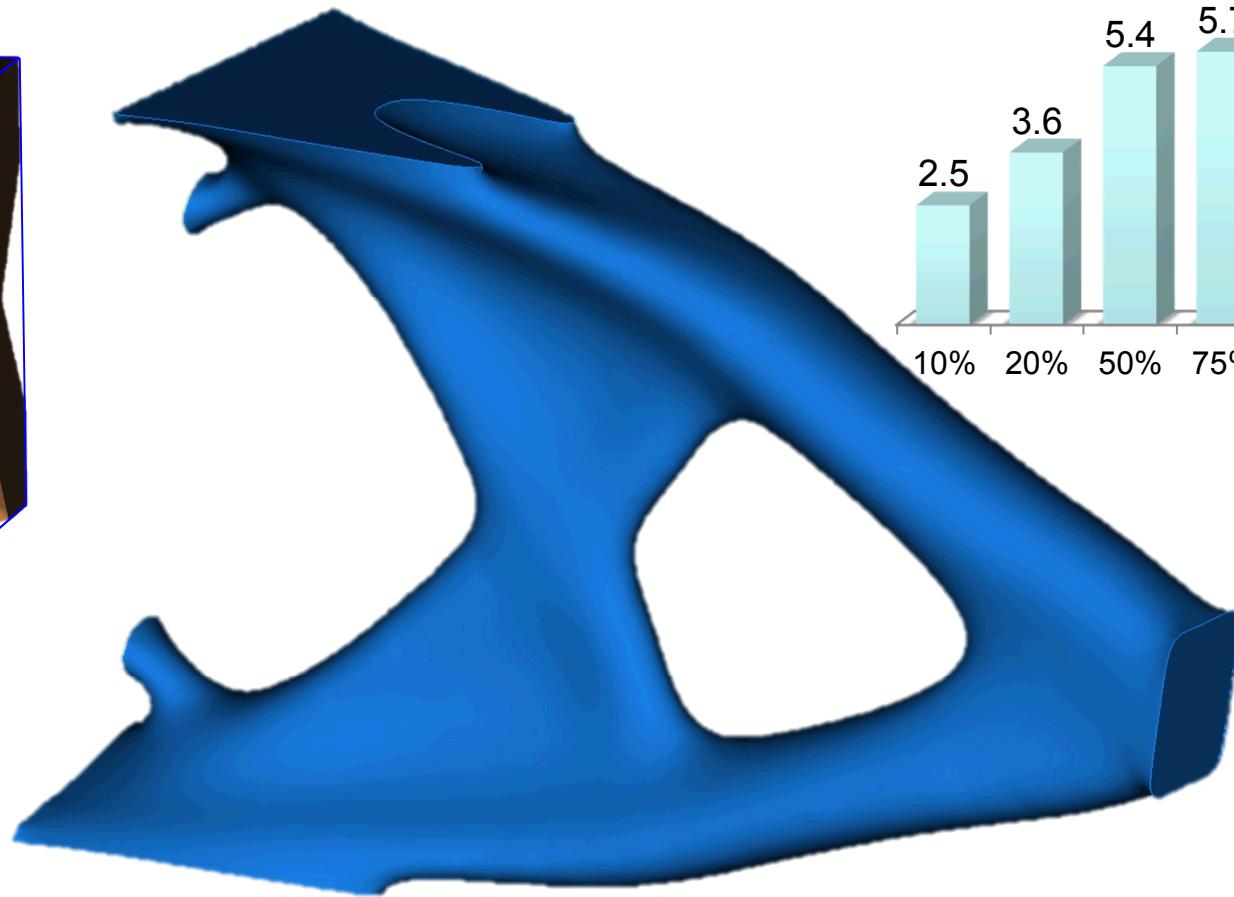
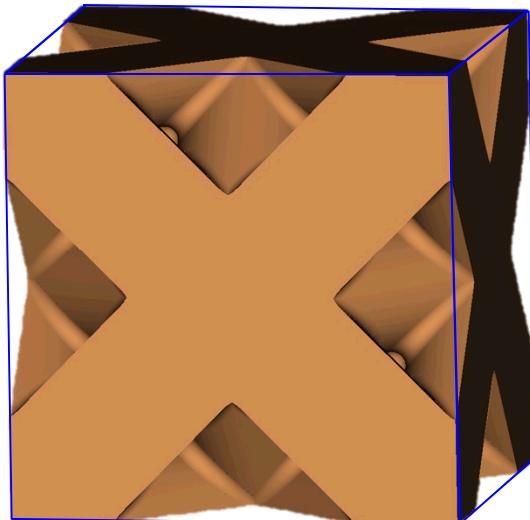


Deflection

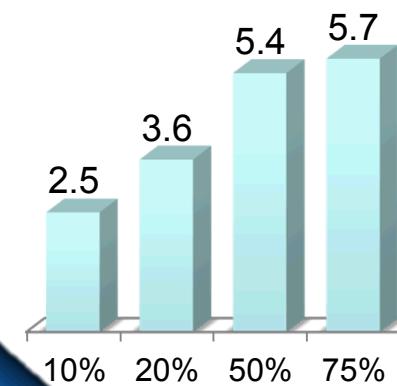


Meso Scale Lattice – Homogenized Continuum

75% Dense

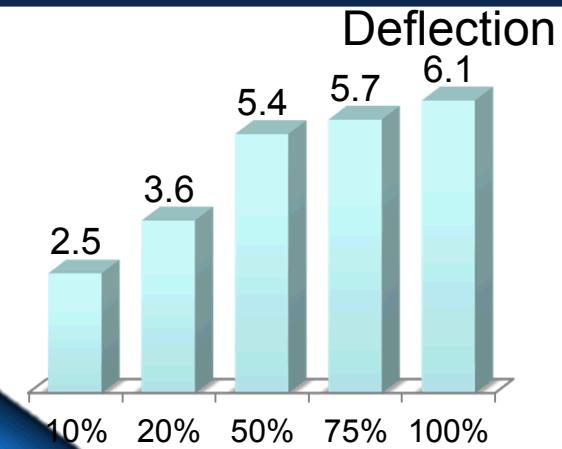
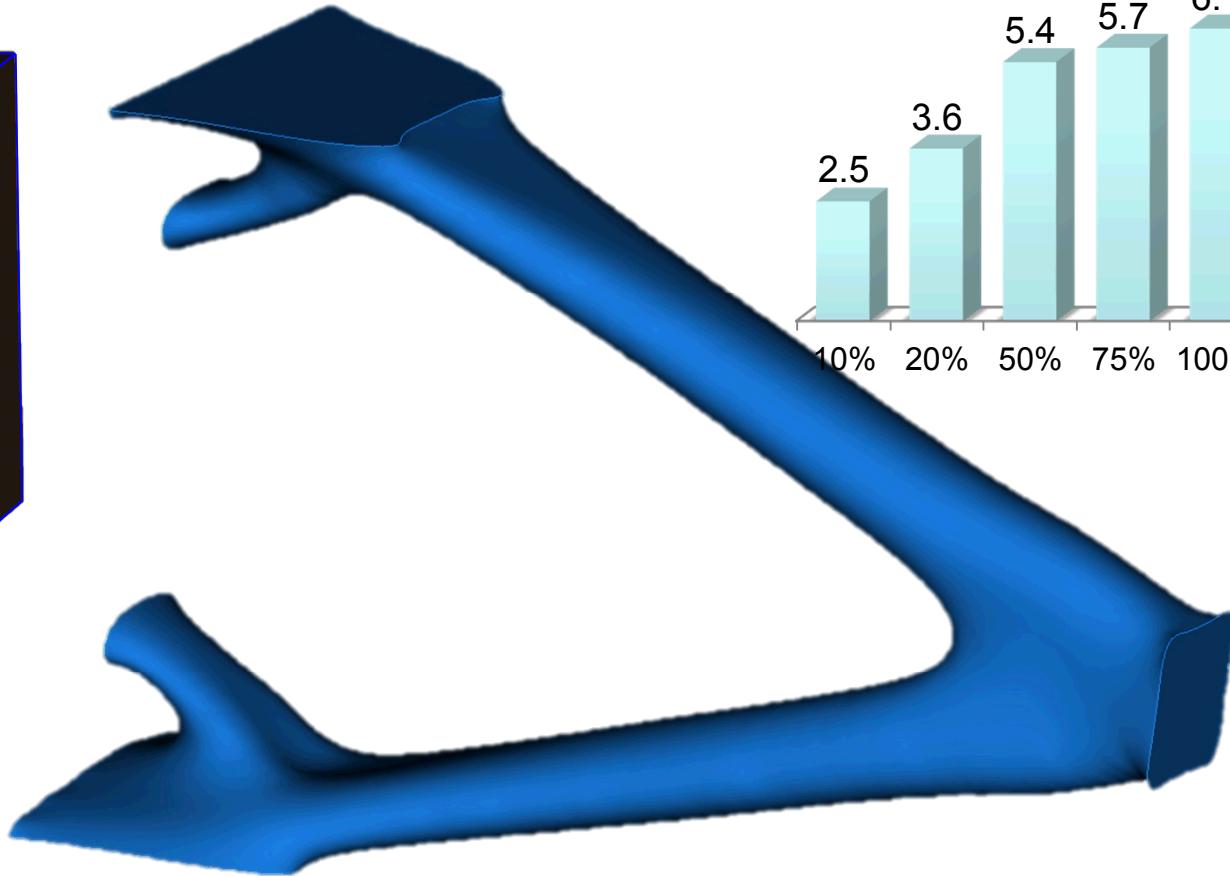
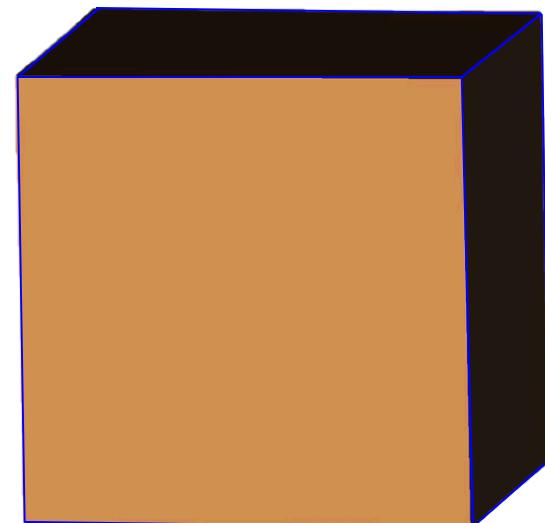


Deflection

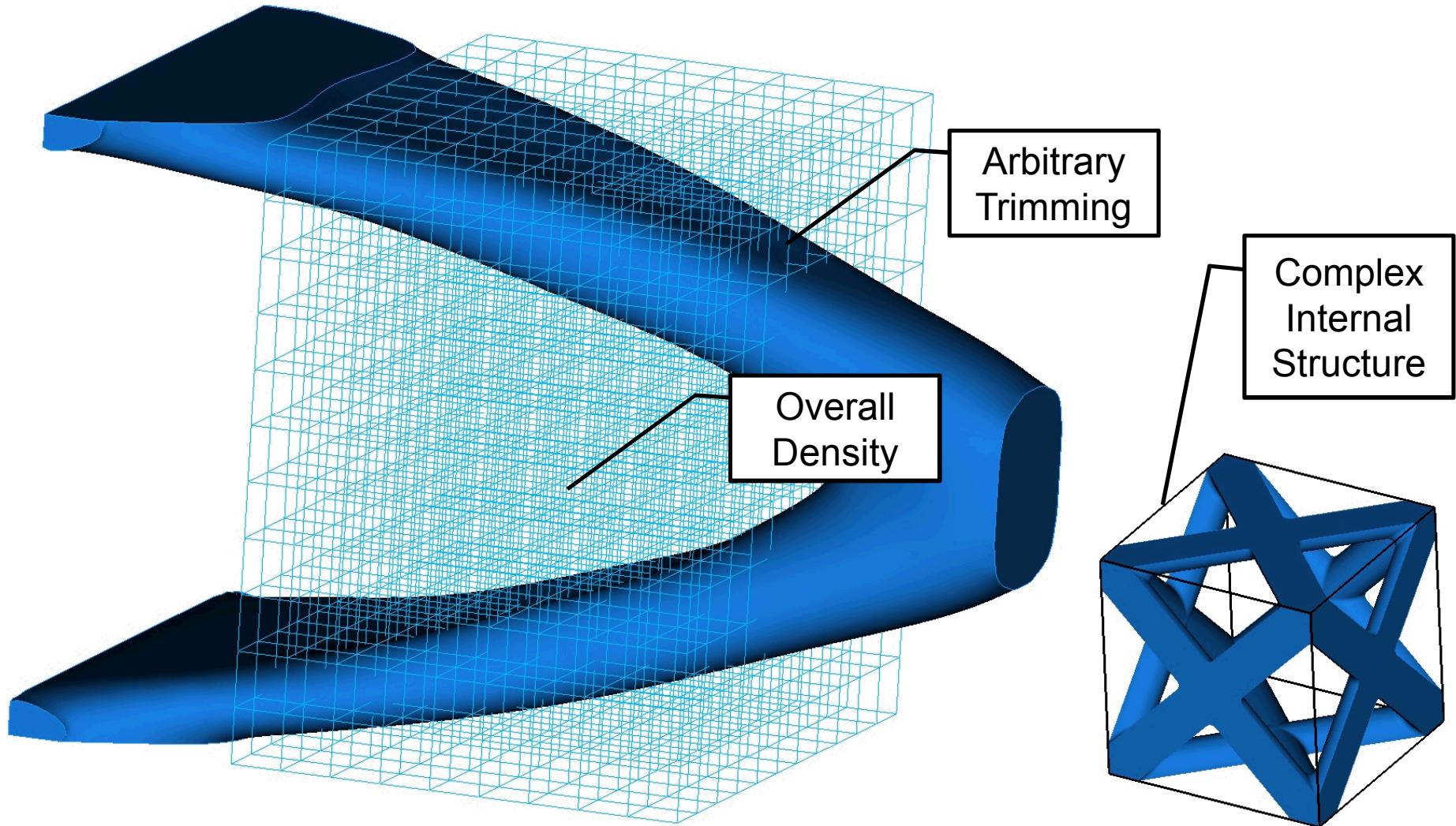


Meso Scale Lattice – Homogenized Continuum

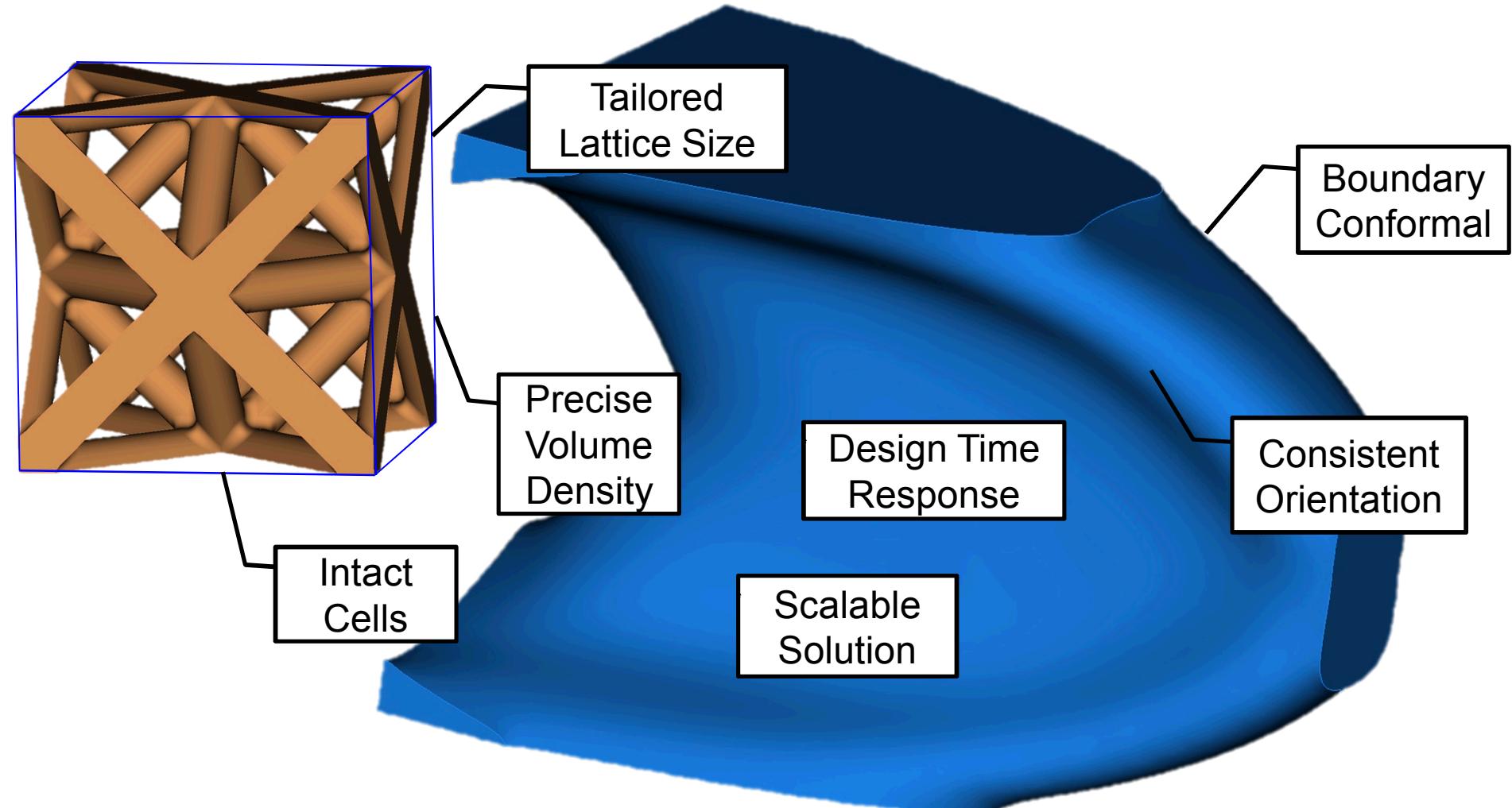
100% Dense



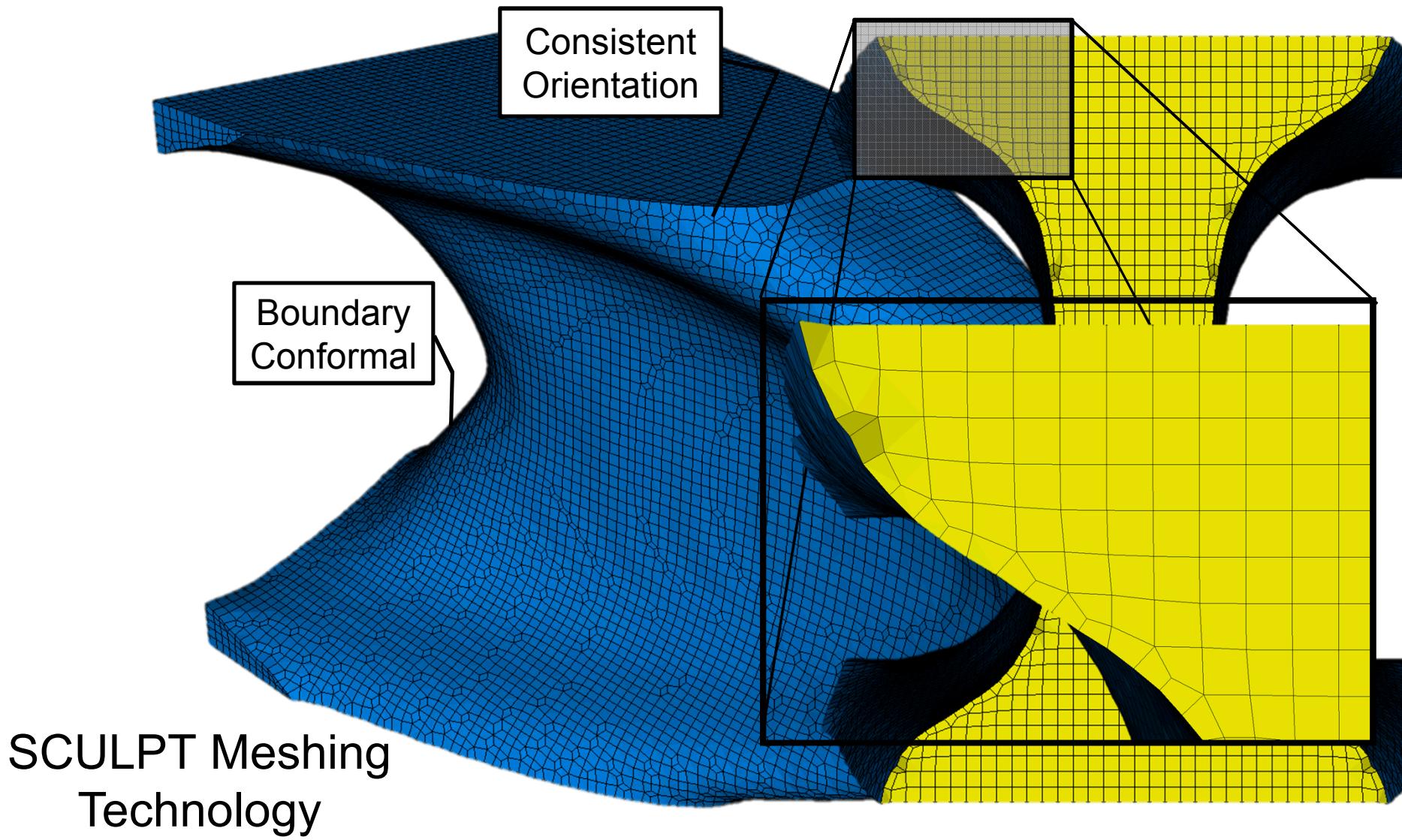
Careful Crafting: Feasible Lattice Printing



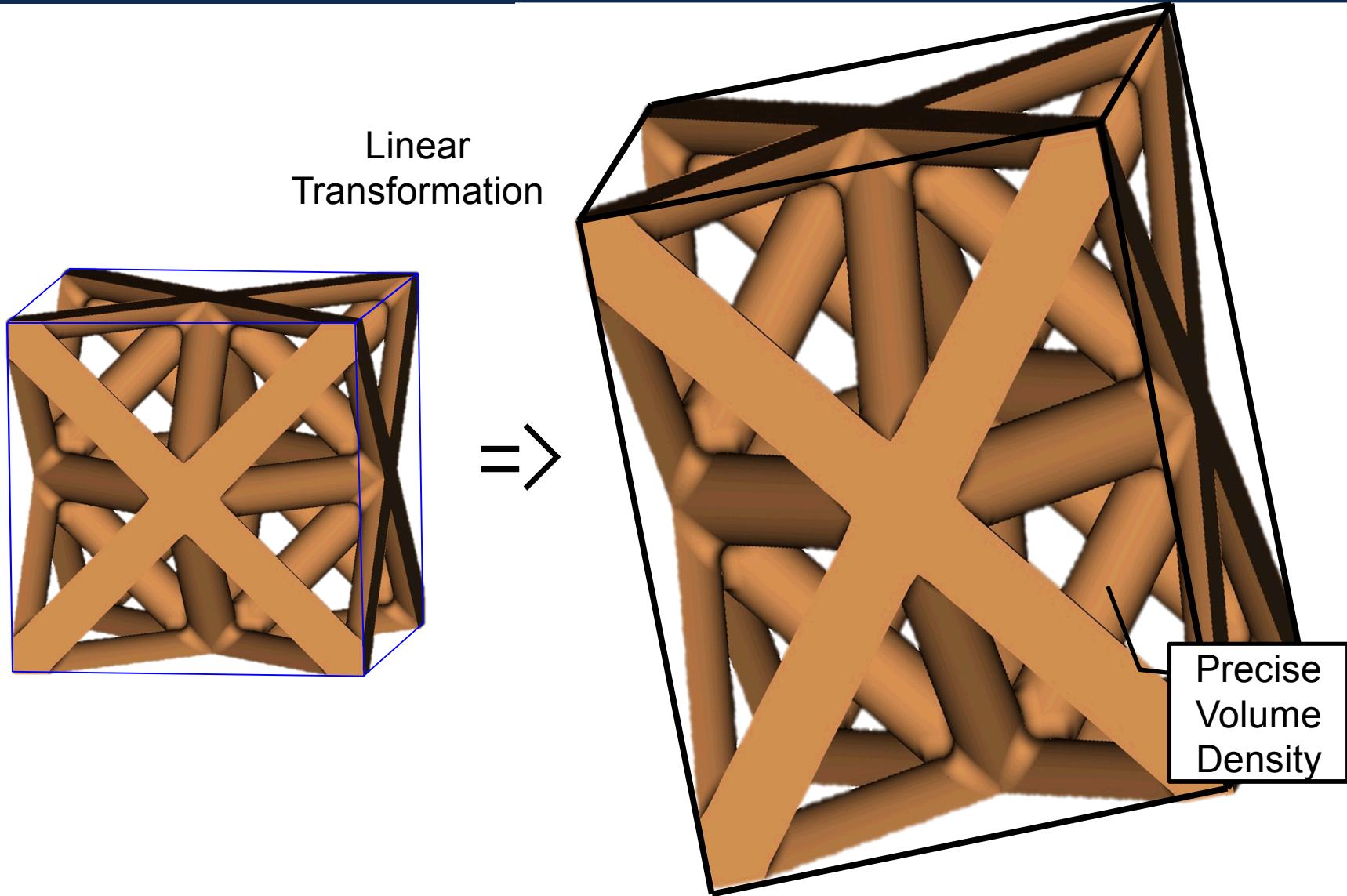
Careful Crafting: Feasible Lattice Printing



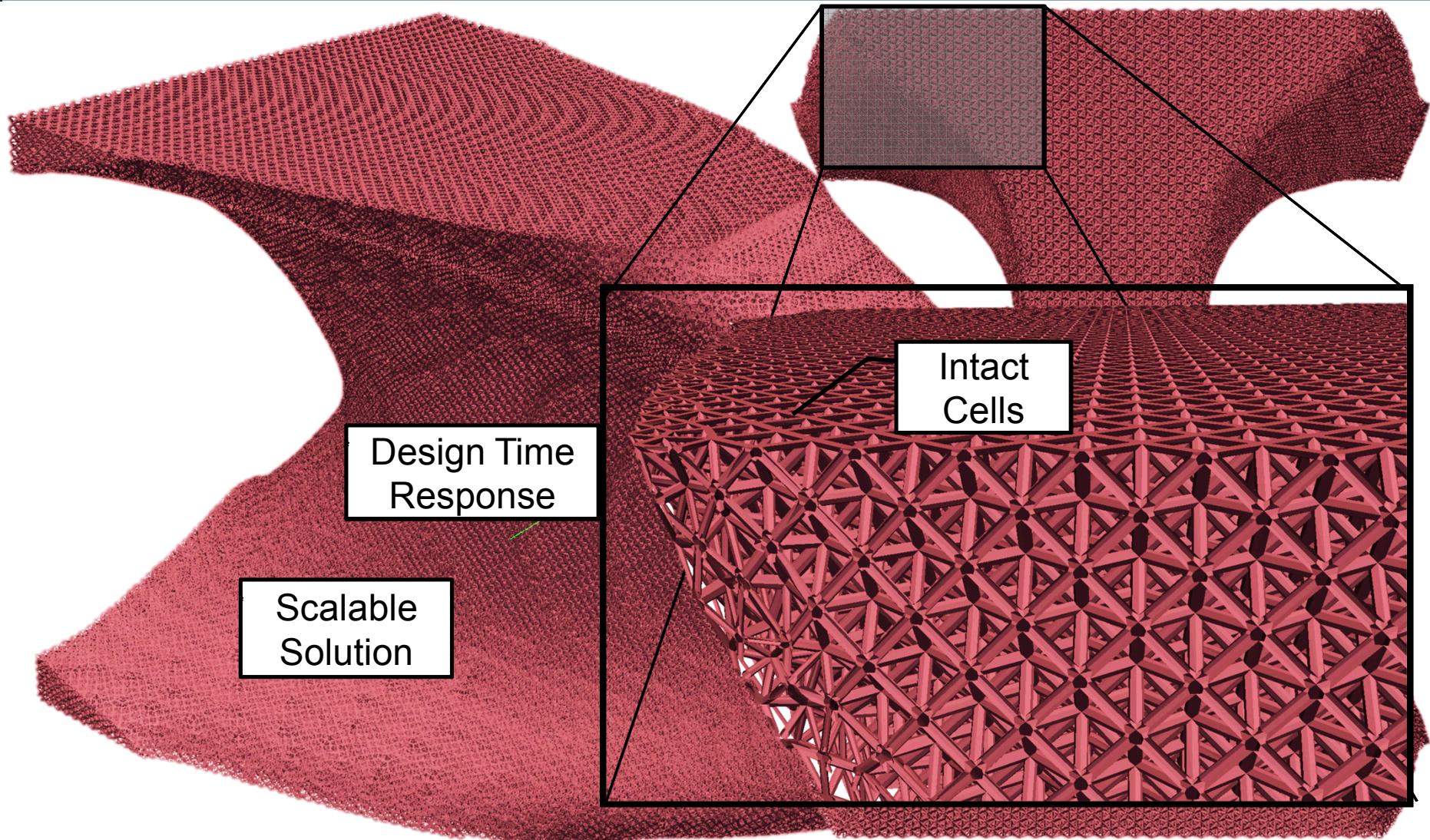
Careful Crafting: Feasible Lattice Printing



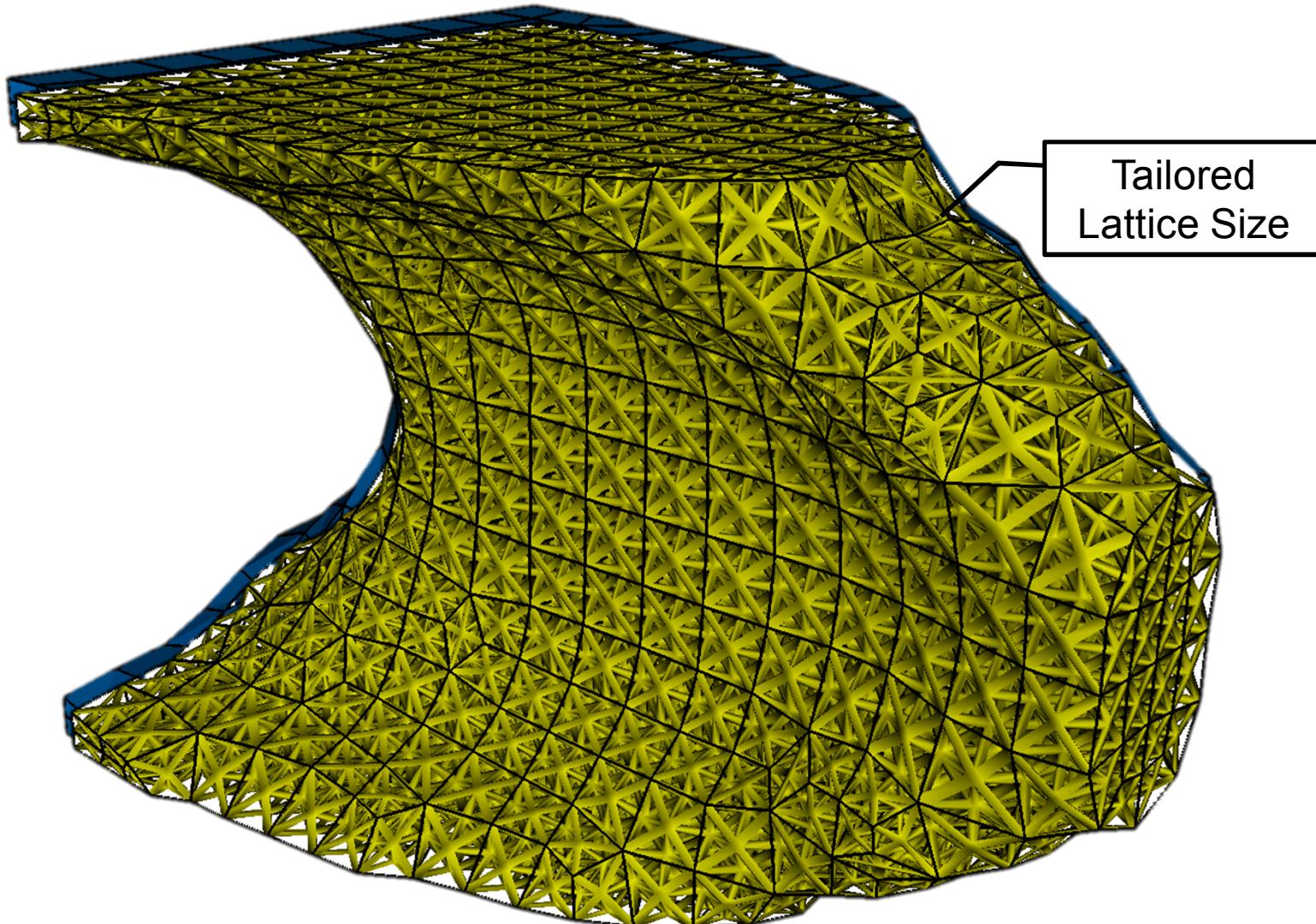
Careful Crafting: Feasible Lattice Printing



Careful Crafting: Feasible Lattice Printing



Careful Crafting: Feasible Lattice Printing



Careful Crafting: Feasible Lattice Printing

