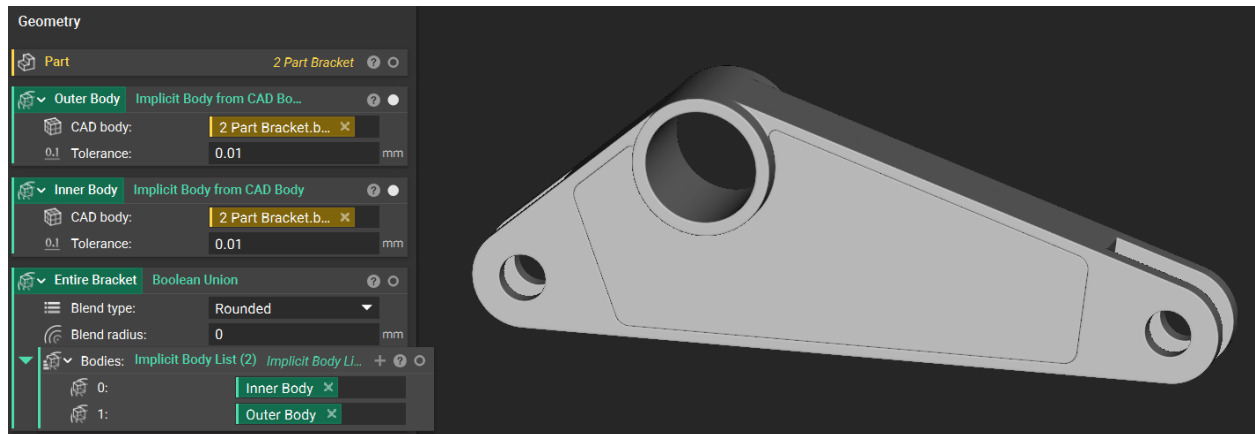


Follow Along: Non-Periodic Lattices

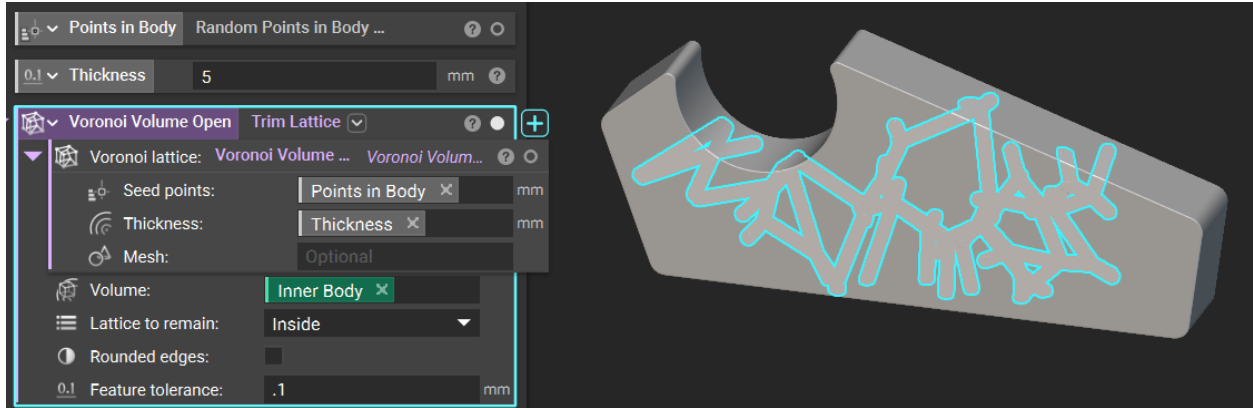
This lesson will demonstrate how to use the **Voronoi Volume Lattice** block, the **Voronoi Surface Lattice** block, and the **Delaunay Lattice** block.

Please download the nTop File below to follow along with the tutorial. This file is the same file used in the previous lesson, "Follow Along: Periodic Lattices," so you can also use that same starting file. The only differences between the two are that there are different section titles in these two download files.

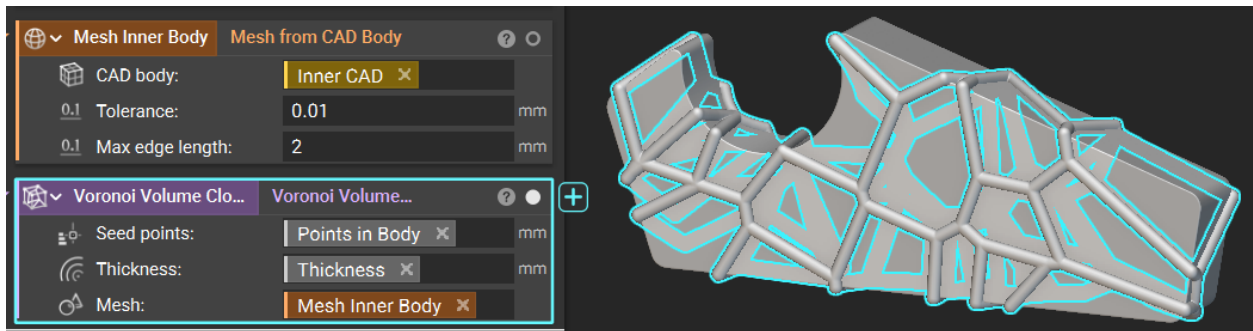
Step 1: The starter file has an embedded two-part CAD bracket in the *Geometry* section. Use two **Implicit Body from CAD Body** blocks to convert to implicit bodies, and make these into variables, *Inner Body* and *Outer Body*. Add a **Boolean Union** block, and merge the two implicit bodies to create a third variable, *Entire Bracket*.



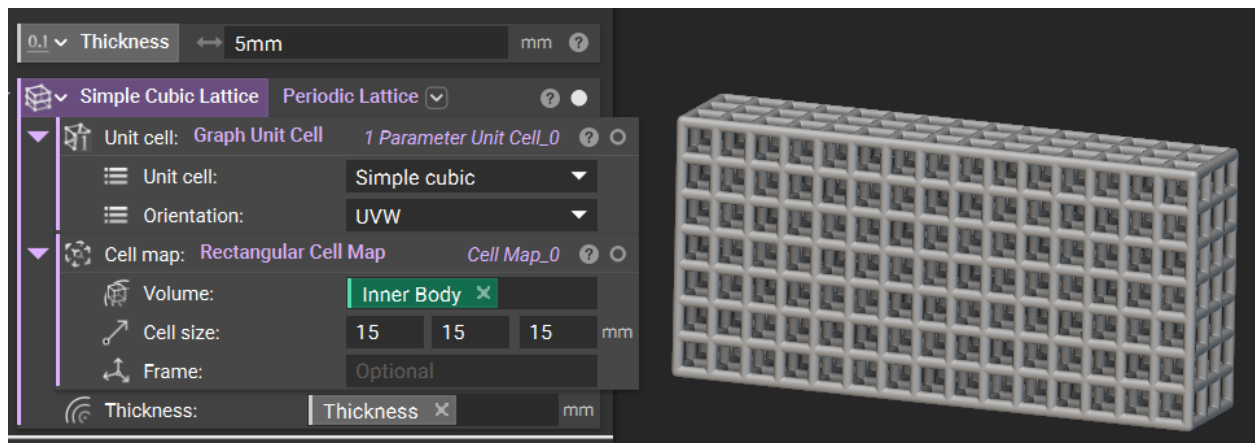
Step 2: Begin with a **Voronoi Volume Lattice** block. For the Body, choose the Inner Body and for Point Spacing, we will use 30mm. For the Thickness, choose 5mm. To remove beams that are going outside of the part, use the **Trim Lattice** or the **Boolean Intersect** block.



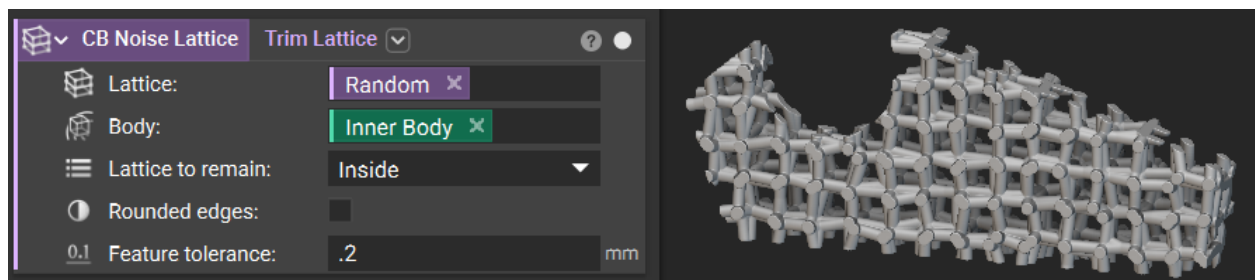
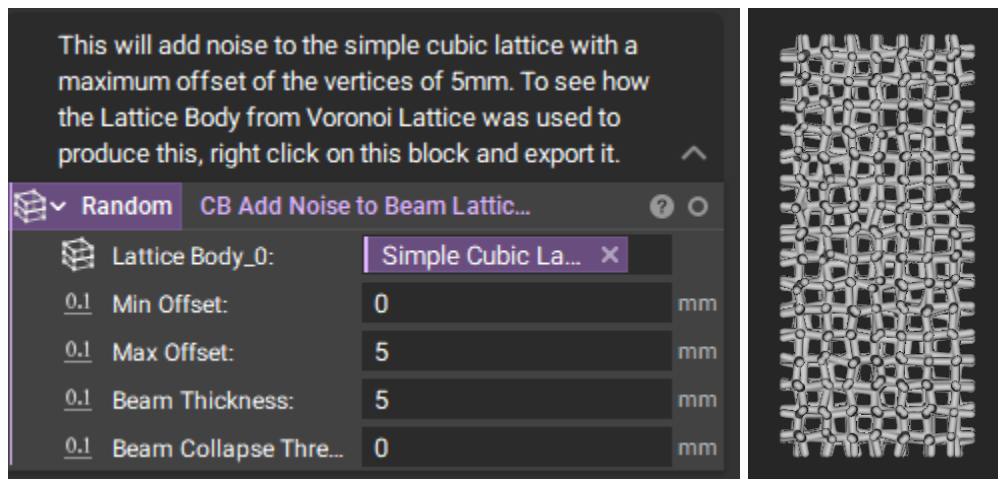
Step 3: You can choose to include or not include a mesh. If you want closed beams, include a **Mesh from CAD Body** as in the steps shown below.



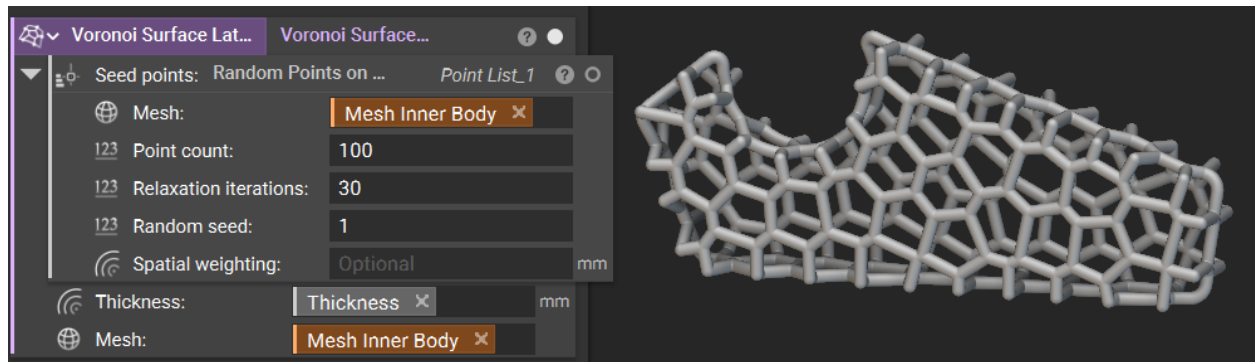
Step 4: If you want to add noise or randomness to a **Periodic Lattice**, you can use the Custom Block: **CB Add Noise to Beam Lattice Body** provided as a file in this lesson. First create a **Periodic Lattice** (In this example we will use the Simple Cubic Graph Lattice).



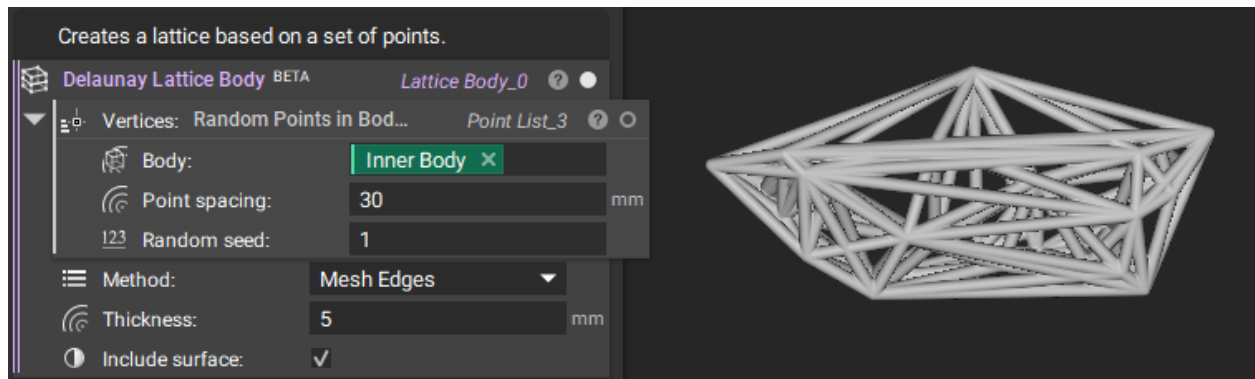
Step 5: Add the **Periodic Lattice** as the Lattice. To increase the randomness, increase that Max Offset. For the Thickness we will use 5mm. Then, use a **Boolean Intersect** or **Trim Lattice** to remove the area of the part that is extending outside of the body.



Step 6: To create a surface lattice on a part, we can use the **Voronoi Surface Lattice**. For the Seed Points, use the **Random Points on Mesh** and instead of defining the point spacing, you will define how many points you want to produce. For the Mesh option in the Seed Points block and the **Voronoi Surface Lattice** block, we will use the *Mesh Inner Body*.



Step 7: For the last step of this lesson, we will create a lattice body using the **Delaunay Lattice** block. You can place the same block used in the **Voronoi Volume Lattice** for the Vertices option. For the method, we can use the Mesh Edges and a thickness of 5mm to get the result below.



Step 8: As we did in previous lessons, merge the inner lattice and *Outer Body*, and trim to the original design space.

