Supporting Information

3D-printed architected materials inspired by cubic Bravais Lattices

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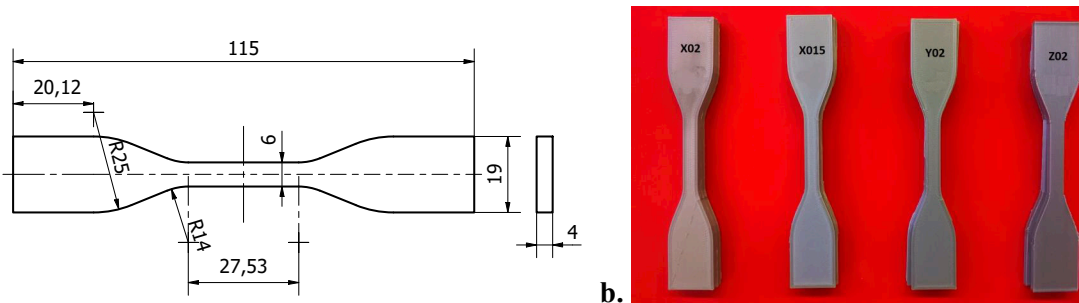**Corresponding author. E-mail: flavia.libonati@unige.it*

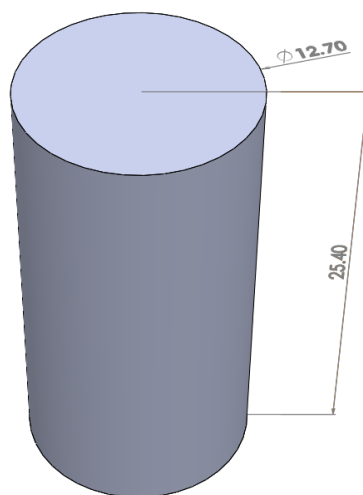**Figure S1** – a) Geometry and dimensions of the dogbone sample (ASTM D638-14). b) 3D-printed samples.

Figure S2 – Geometry and dimensions of the cylindrical sample for compression tests (ASTM-D695).

Table S1 - Calibration of 3D solid models: Elastic moduli applied to nodes and struts for each numerical simulation (for each lattice topology).

Combination	% at Nodes	*E* at Nodes (*MPa*)	% at Struts	*E* at Struts (*MPa*)
1	100%	3385	100%	3385
2	100%	3385	90%	3046.5
3	100%	3385	80%	2708
4	100%	3385	70%	2369.5
5	100%	3385	60%	2031
6	100%	3385	50%	1692.5
7	90%	3046.5	90%	3046.5
8	90%	3046.5	80%	2708
9	90%	3046.5	70%	2369.5
10	90%	3046.5	60%	2031
11	90%	3046.5	50%	1692.5
12	80%	2708	80%	2708
13	80%	2708	70%	2369.5
14	80%	2708	60%	2031
15	80%	2708	50%	1692.5
16	70%	2369.5	70%	2369.5
17	70%	2369.5	60%	2031
18	70%	2369.5	50%	1692.5
19	60%	2031	60%	2031
20	60%	2031	50%	1692.5
21	50%	1692.5	50%	1692.5

Table S2 – Calibration of 3D beam models: Elastic moduli applied to each numerical simulation (for each lattice topology).

RUN	%	*E(MPa)*
1	100%	3385
2	90%	3047
3	80%	2708
4	70%	2370
5	60%	2031
6	55%	1862
7	50%	1693

Table S3 – 3D solid models: Elastic moduli that best approximate the experimental behavior.

Cell	Elastic Modulus assigned to Nodes [MPa]	Elastic Modulus Assigned to Struts [MPa]
SC	2708	2031
BCC	3047	2031
FCC	2708	2031

Table S4 – 3D beam models: Elastic moduli that best approximate the experimental behavior.

Cell	Elastic Modulus assigned [MPa]
SC	1693
BCC	1862
FCC	2031

Table S5 – Experimental results of the SC cells.

	Max Load [N]	Stiffness [N/mm]	Elastic modulus [MPa]	Max Stress [MPa]	Deformation Energy [MJ/m^3]	Max Strain [-]
Average SC	437.0 ± 52.0	1136.0 ± 131.2	71.05 ± 8.23	1.71 ± 0.21	0.068 ± 0.018	0.090 ± 0.018
SC015-L	451.5 ± 102.1	1290.2 ± 168.1	80.62 ± 10.51	1.76 ± 0.40	0.066 ± 0.032	0.076 ± 0.023
SC015-T	443.1 ± 60.4	1034.7 ± 203.5	64.63 ± 12.74	1.73 ± 0.24	0.076 ± 0.021	0.090 ± 0.017
SC02-L	430.7 ± 30.3	1292.3 ± 96.7	80.83 ± 6.02	1.68 ± 0.12	0.059 ± 0.008	0.085 ± 0.010
SC02-T	422.5 ± 15.1	926.4 ± 56.6	57.93 ± 3.56	1.65 ± 0.06	0.072 ± 0.011	0.108 ± 0.020

Table S6– Experimental results of the BCC cells.

	Max Load [N]	Stiffness [N/mm]	Elastic modulus [MPa]	Max Stress [MPa]	Deformation Energy [MJ/m^3]	Max Strain [-]
Average BCC	685.5 ± 52.9	1463.0 ± 83.0	91.43 ± 5.19	2.68 ± 0.21	0.140 ± 0.020	0.102 ± 0.014
BCC015-L	655.5 ± 82.6	1527.9 ± 158.4	95.49 ± 9.90	2.56 ± 0.32	0.123 ± 0.014	0.099 ± 0.016
BCC015-T	771.4 ± 20.4	1529.7 ± 68.9	95.61 ± 4.30	3.01 ± 0.08	0.169 ± 0.013	0.111 ± 0.017
BCC02-L	606.5 ± 69.0	1459.2 ± 62.3	91.20 ± 3.89	2.37 ± 0.27	0.107 ± 0.026	0.087 ± 0.014
BCC02-T	708.6 ± 39.4	1335.0 ± 42.5	83.33 ± 2.65	2.77 ± 0.15	0.160 ± 0.026	0.111 ± 0.010

Table S7 – Experimental results of the FCC cells.

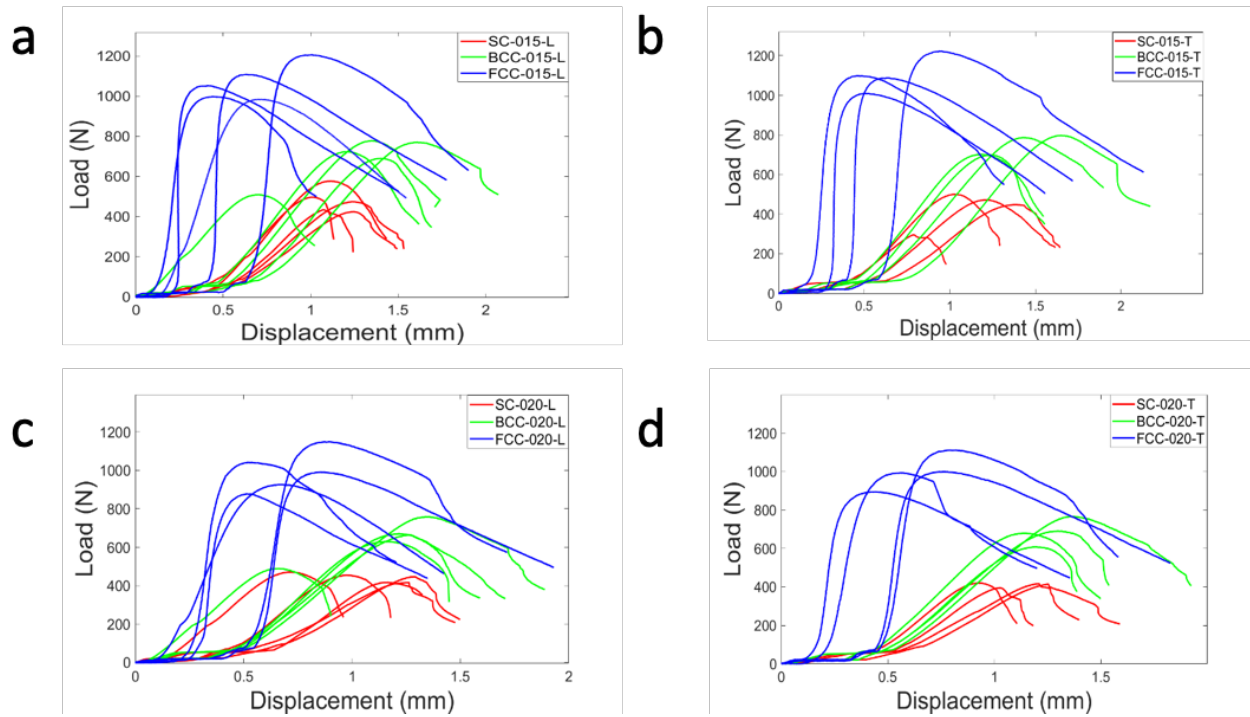|	Max Load [N]	Stiffness [N/mm]	Elastic modulus [MPa]	Max Stress [MPa]	Deformation Energy [MJ/m^3]	Max Strain [-]
Average FCC	1019.0 ± 49.5	2192.8 ± 314.8	139.8 ± 18.4	3.98 ± 0.19	0.276 ± 0.074	0.121 ± 0.025
FCC015-L	1007.5 ± 27.8	2526.6 ± 650.0	158.6 ± 38.6	3.94 ± 0.11	0.283 ± 0.180	0.116 ± 0.031
FCC015-T	1089.8 ± 64.6	2156.0 ± 120.0	141.0 ± 6.4	4.26 ± 0.25	0.282 ± 0.051	0.105 ± 0.017
FCC02-L	927.5 ± 48.1	2041.2 ± 369.1	129.5 ± 22.5	3.62 ± 0.19	0.267 ± 0.016	0.144 ± 0.035
FCC02-T	1051.2 ± 57.5	2047.5 ± 120.2	130.2 ± 6.0	4.11 ± 0.22	0.270 ± 0.050	0.119 ± 0.015

Figure S3 – Load-displacement curves of all the unit cells. The acronym indicates the unit cell, the number indicates the layer thickness and the final letter the loading direction (L, longitudinal and T, transversal).
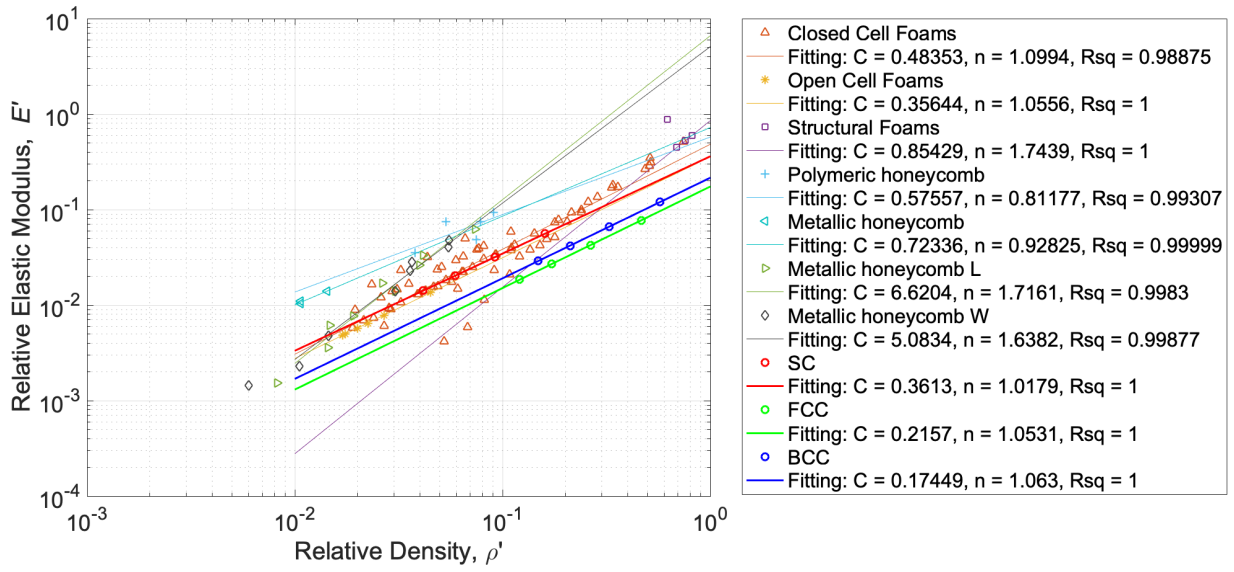
Figure S4 – Ashby plot and scaling laws for different cellular materials (data taken from CES Edu Pack) and comparison with the studied lattices (data taken from FE-simulations).