3D printing macroscale engineered materials using ultrasound directed self-assembly and stereolithography

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Supplemental information

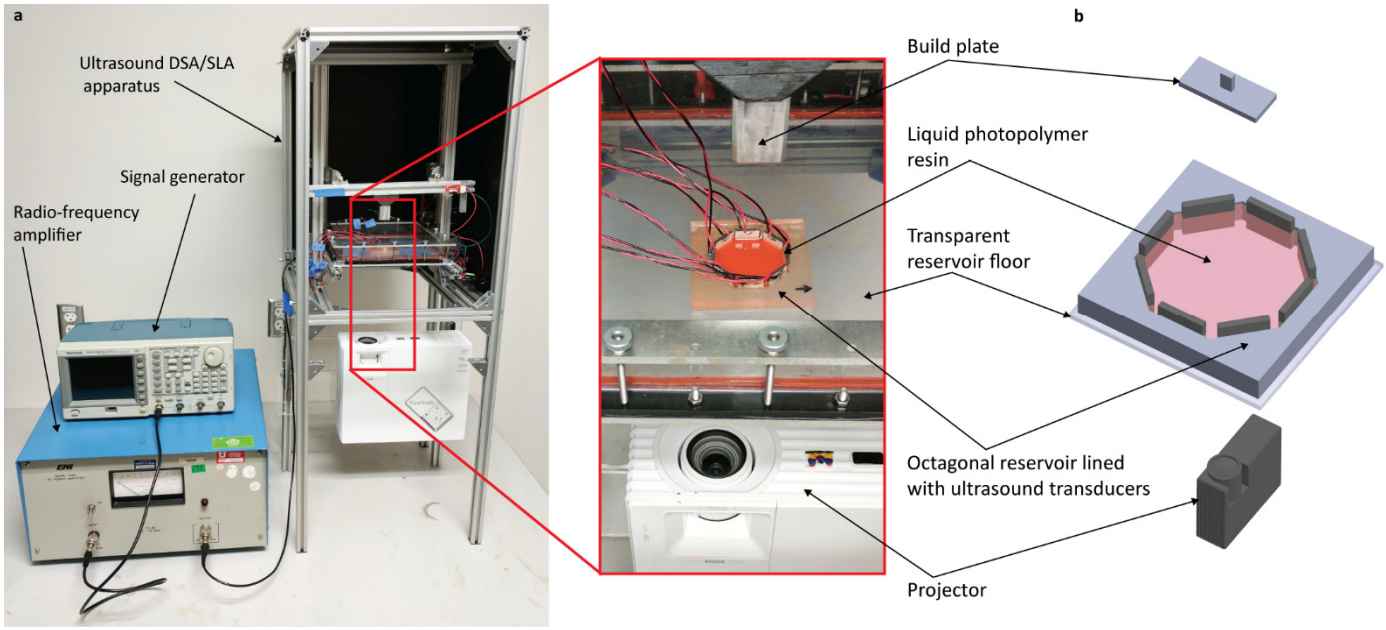

Figure S1| Ultrasound directed self-assembly (DSA)/stereolithography (SLA) apparatus. (a) Photograph of the ultrasound DSA/SLA apparatus with a magnified inset image and **(b)** schematic illustrating the critical components used to 3D print engineered materials containing user-specified patterns of particles.

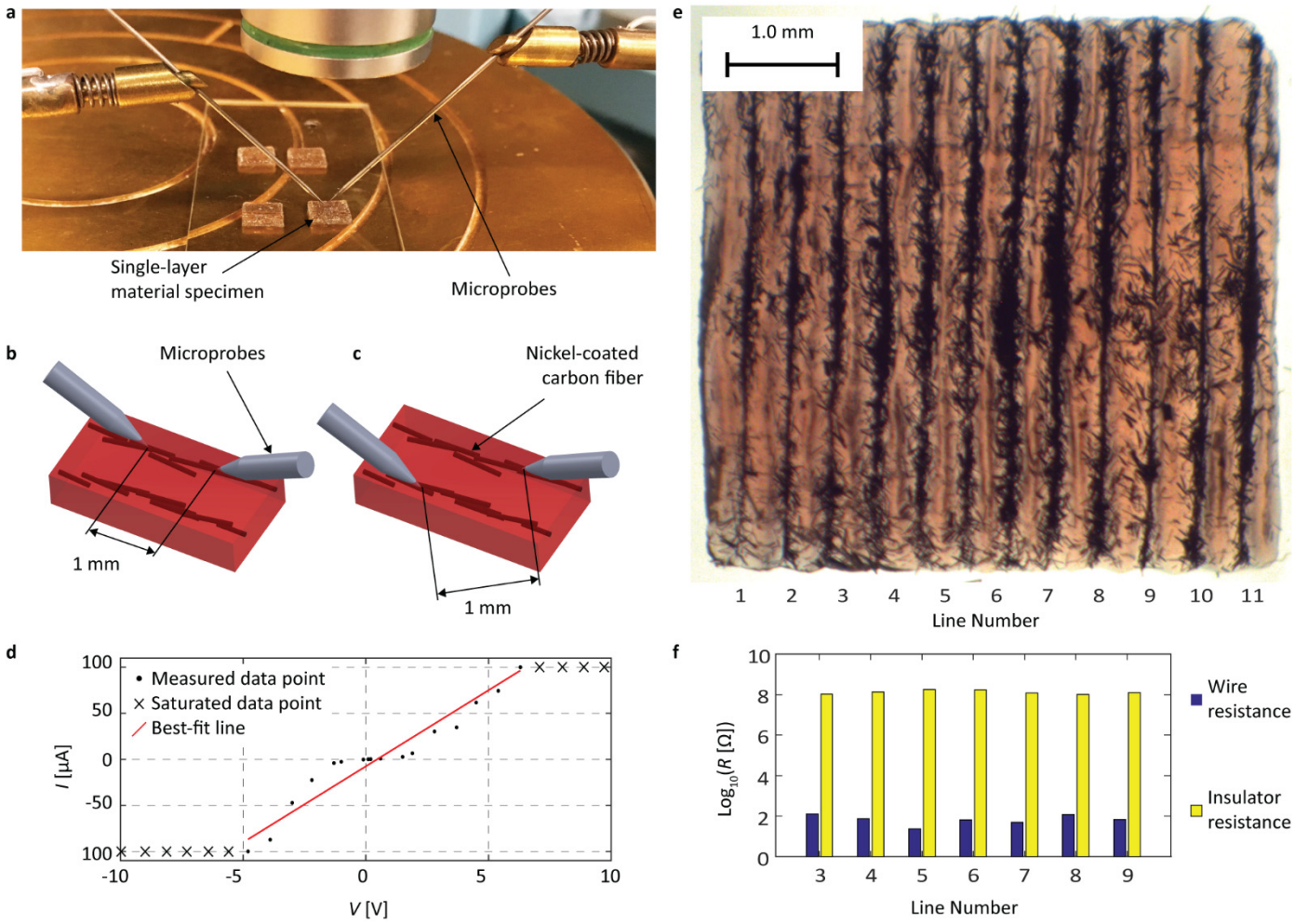

Figure S2| Electrical characterization of single-layer material specimens. (a) Two microprobes are placed on the material specimen along **(b)** a single line of nickel-coated carbon fibers to measure the "wire resistance" or **(b)** between two neighboring lines of nickel-coated carbon fibers to measure the "insulator resistance". **(d)** We apply direct-current voltage V to the microprobes and measure the resulting current I to calculate the resistance R as the slope of the best-fit line. **(e)-(f)** We repeat the resistance measurements along lines 3-9, as a representative sample of the material specimen.

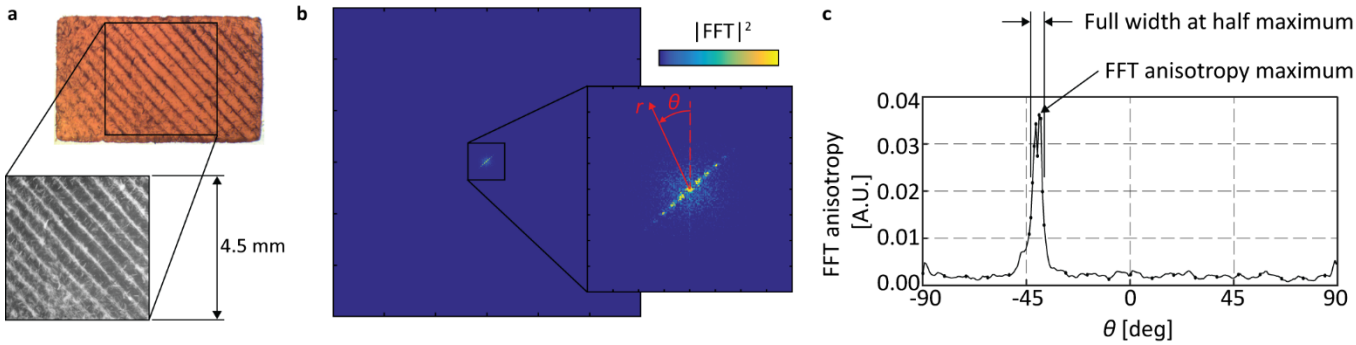

Figure S3| Characterization of fast Fourier transform (FFT) anisotropy. (a) A 4.5 × 4.5 mm region of the image converted to grayscale to compute **(b)** the 2D FFT as a function of the radius r and angle θ from the FFT image center. **(c)** Radially summing the squared FFT yields the FFT anisotropy as a function of angle θ, which is characterized in terms of the FFT anisotropy maximum and the full width at half maximum.