Electronic Supplementary Material (ESI) for Nanoscale.

<Supplementary Information>

Carbon nanotube fibers with enhanced longitudinal carrier mobility for high-performance all-carbon thermoelectric generators

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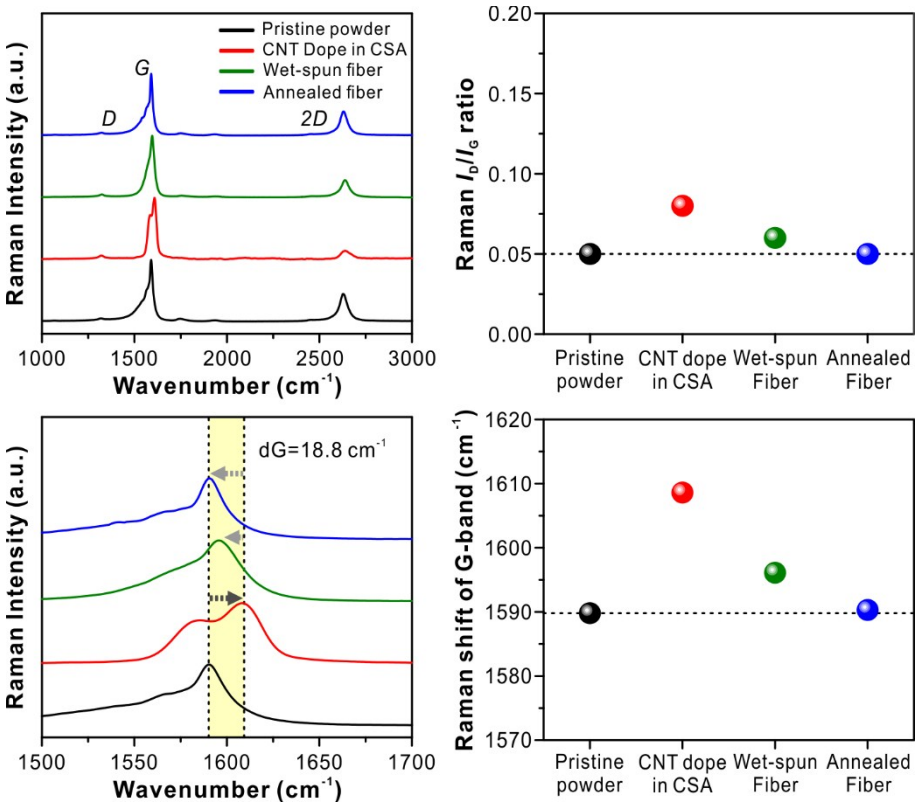


Fig. S1 Raman spectra (λ_{ex}=633 nm) for pristine CNT powder, CNTs dispersed in CSA, wet-spun CNT fibers, and CNT fibers annealed at 250 °C for 2 h. The Raman spectra are normalized to the intensity of the G-band peak.

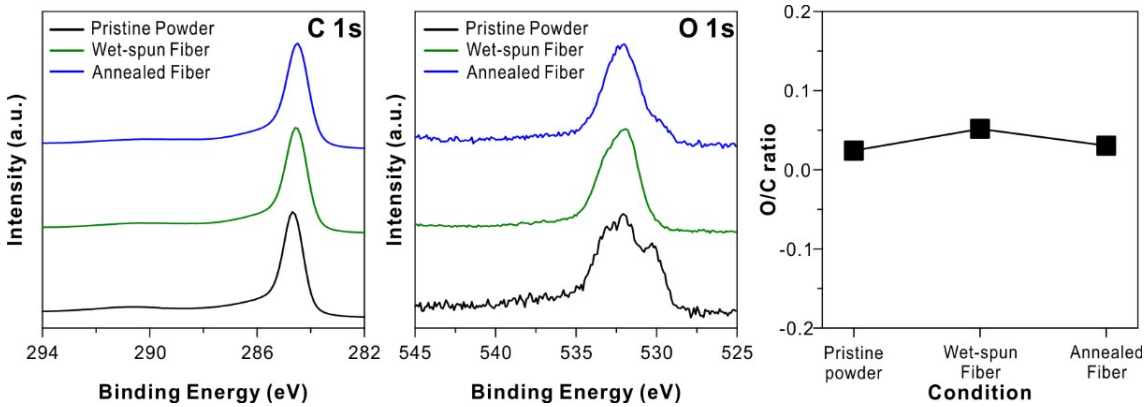


Fig. S2 XPS high-resolution C(1s) spectra, O(1s) spectra, and relative O/C content ratios of pristine CNT powder, wet-spun CNT fibers, and CNT fibers annealed at 250 °C for 2 h.

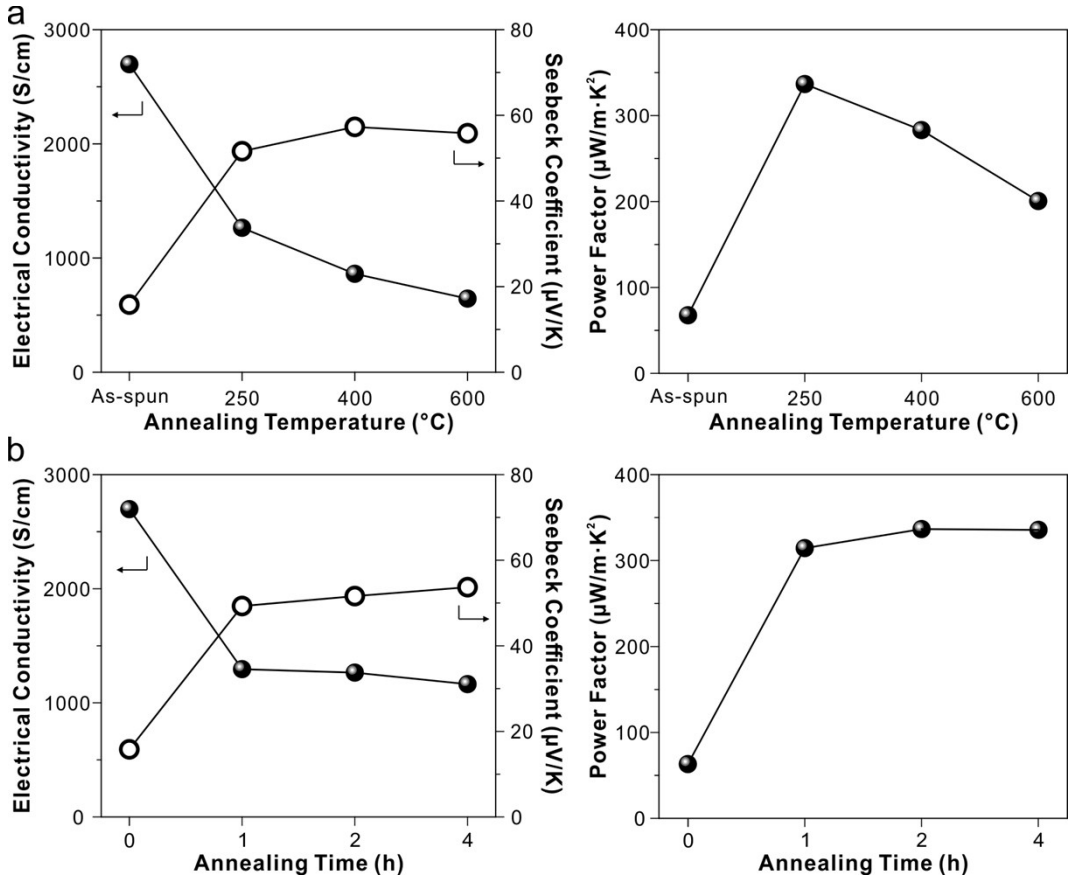


Fig. S3 TE performances of the as-spun CNT fibers as a function of (a) annealing temperature for 2 h and (b) annealing time at 250 °C. The CNT fibers spun from a 10 mg/mL CNT concentration were used for thermal annealing at various conditions.

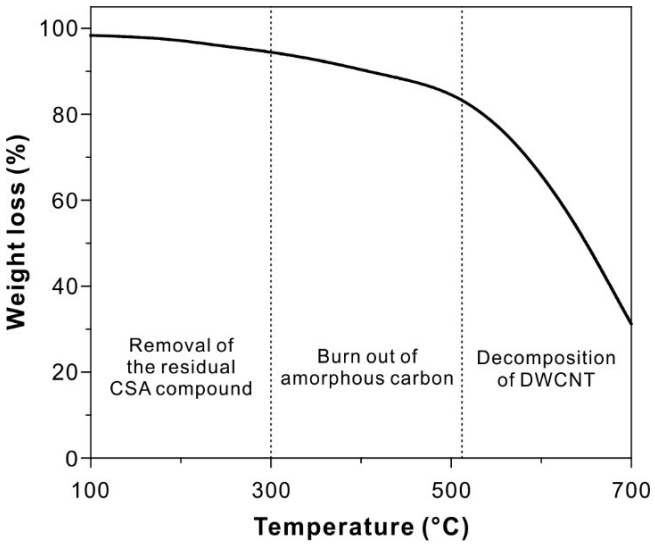


Fig. S4 Thermogravimetric analysis (TGA) curve of the as-spun CNT fiber. It was measured with a heating rate of 10 ^{o}C/min under Ar.

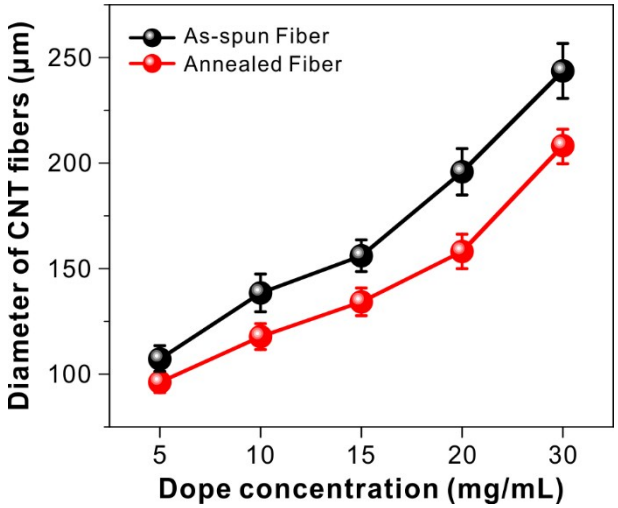


Fig. S5 Diameters of the CNT fibers as a function of CNT concentration before and after thermal annealing.

Table S1. A comparison of the wet-spun CNT fiber to the CNT film on the TE performances. The CNT fiber and film were prepared with the same CNT powder.

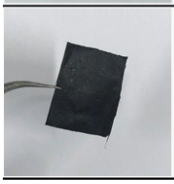
Types of CNT		Electrical Conductivity (S/cm)	Seebeck Coefficient (μV/K)	Power Factor ($\mu W/m \cdot K^2$)
	As-spun CNT Fiber (1D)	2939	18	92
	Annealed CNT Fiber (1D)	1353	57	432
	CNT Film (2D)	497	46	106

Table S2. A comparison of this work to recent works on TE performance of the wet-spun CNT fibers. Data points were extracted from the references.

No.	Fiber Composition	Thermoelectric power factor (uW/mk^2)		Literature
		p-type fiber	*n*-type fiber	
1	PANI/MWCNT	0.17		*J. Mater. Chem.*, **2012**, *22*, 17612
2	P3OT/carbon fiber	7.05		*Composites: Part B* **2015**, *69*, 467
3	Lignin/PAN fiber	9.27	10.2	*Int. J. Biol. Macromol.*, **2019**, *121*, 472
4	PEG/SWCNT	82	48.2	*J. Mater. Chem. A* **2017**, *5*,12068
5	PEDOT:PSS/SWCNT	83.2	113.2	*Carbon* **2018,** *133,* 293
6	PVDF/SWCNT	378	289	*Nanoscale* **2018**, *10*, 19766
7	DWCNT	431.8	322.6	This work