Supporting Information

Reversible photoinduced twisting of molecular crystal microribbons

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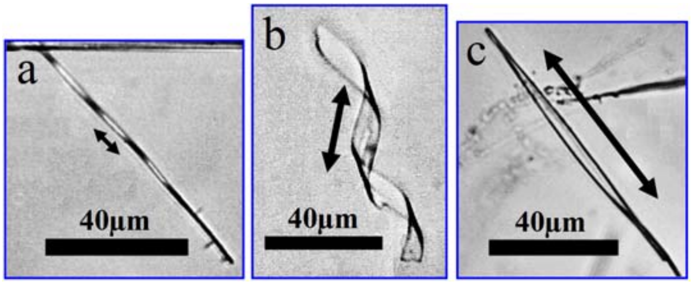

Figure S1. 9AC ribbons with different twisting period (L_{twist}); Arrows next to the ribbons signify the length of half twisting period (1/2 L_{twist}).

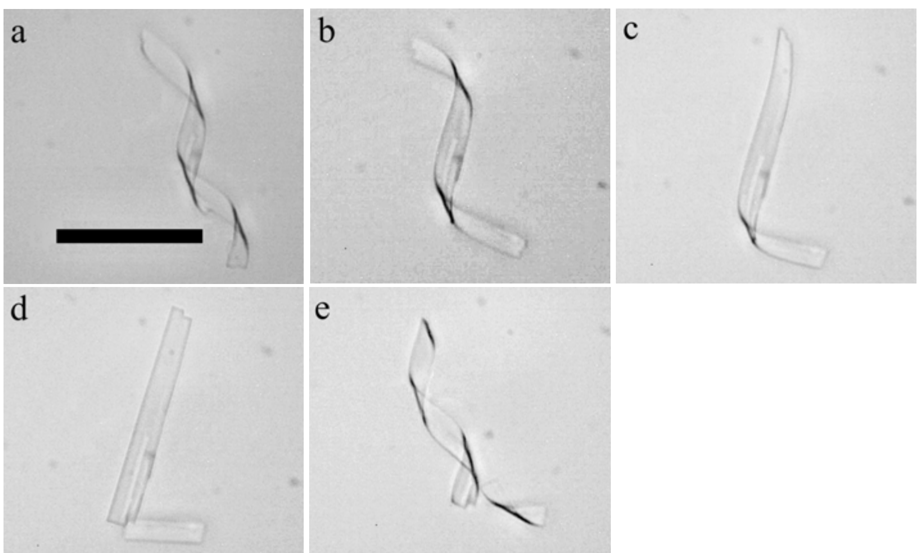

Figure S2. 9AC crystal ribbon twists under 440 nm (~20 mW/cm^2) irradiation, relaxes in room light; **a)** immediately after first exposure; **b)** after 2.5 minutes; **c)** after 4 minutes; **d)** after 13 minutes; **e)** immediately after second exposure. Notice that after the second exposure, the 9AC ribbon twists in a different direction compared with first exposure. The origin of this random twisting direction is discussed in the paper. The scale bar is 50 µm.

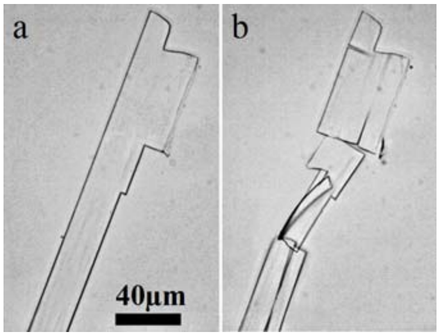

Figure S3. Large ribbons tend to break in the process to twist under irradiation.

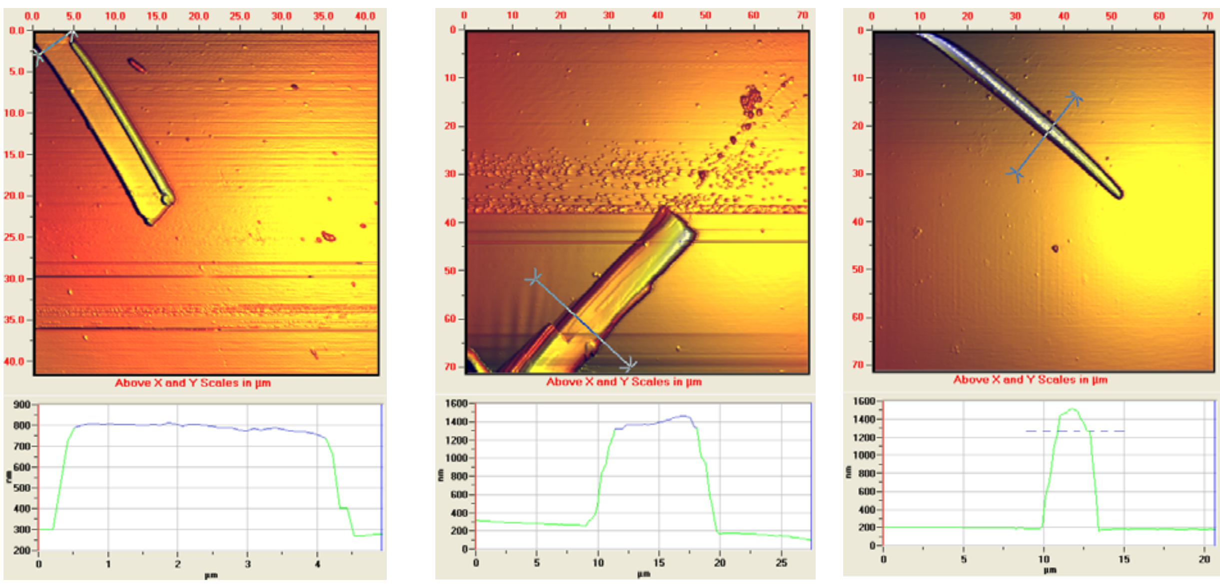

Figure S4. Examples of AFM profile images of microribbons

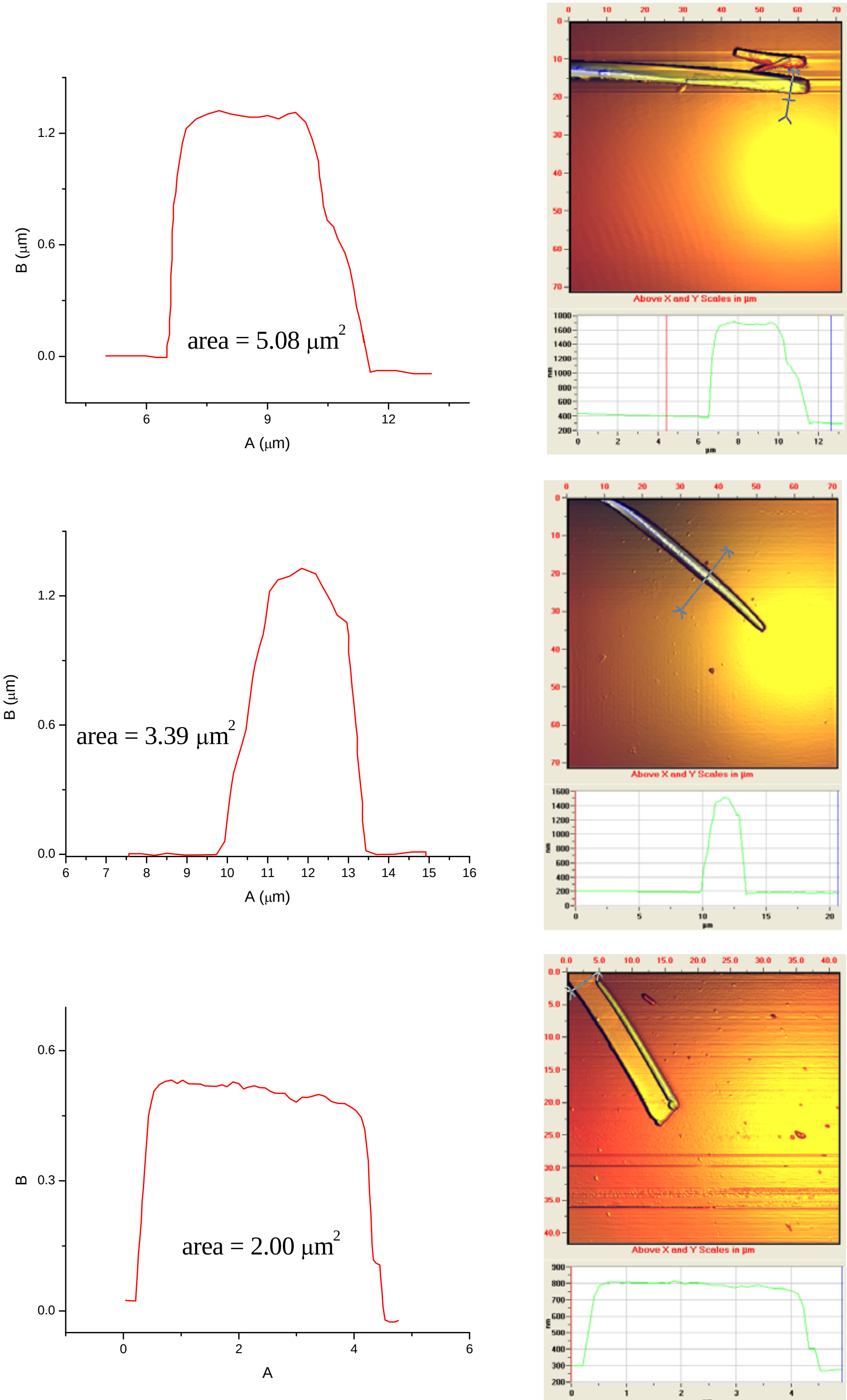

Figure S5. The cross-section areas of the ribbons were obtained through numerical integration of the AFM profiles using Origin 8.0, as shown for three different ribbons.

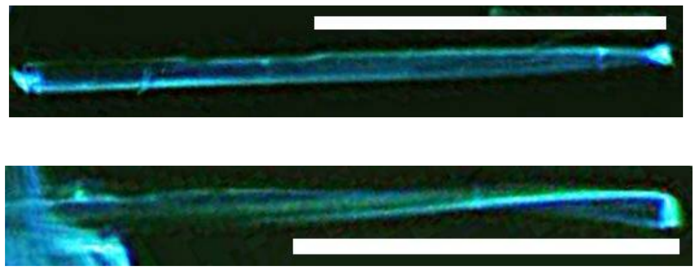

Figure S6. Fluorescence microscopy images of twisted ribbons on a solid substrate where AFM profiles could be measured. As shown in the above images, many ribbons showed only a half-twist, which could still be used to obtain L_{twist}. The scale bars are 50 µm.

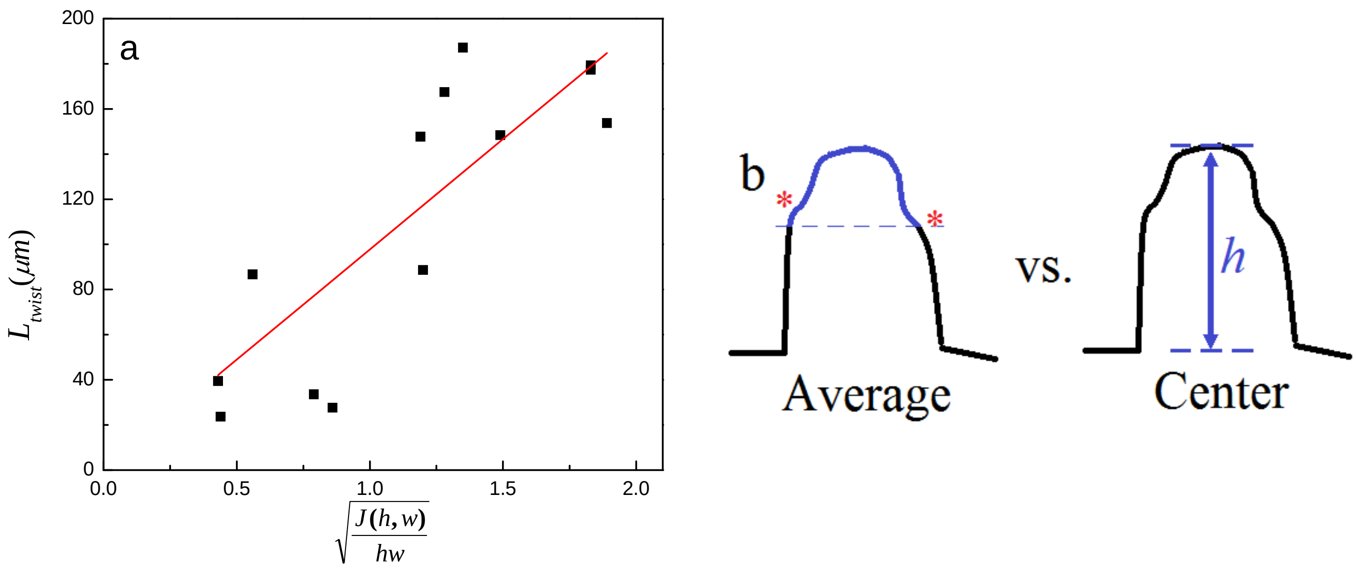

Figure S7. In the text, we take h to be the height at the center of the image and w to be the width at $h/2$. An alternative approach is to find the lowest inflection point, and extract h by taking the average of the heights from this point to the point on the other side of the ribbon with the same height; and extract the width at $h/2$ to be w). This procedure is shown in **b).** When we take this approach to tabulate h and w values, we can again plot L_{twist} vs. $\sqrt{\frac{J(h,w)}{hw}}$ as given by Equation (5). The R^2 value of this fit is 0.93, with a slope = 98, as compared to the slope = 96 from the method described in the text.

Supplementary Table 1

	h (μm)	*w (μm)*	*S* (μm^2)	$\sqrt{\frac{J(h,w)}{hw}}$	L_{twist} *(μm)*
1	0.38	2.72	1.08	0.42	39.4
2	1.29	4.09	5.08	1.33	187.18
3	0.82	3.37	2.47	0.87	33.5
4	1.33	2.62	3.39	1.27	147.78
5	1.42	9.84	13.31	1.56	148.46
6	1.93	4.57	8.74	1.91	177.34
7	0.62	1.67	0.97	0.62	23.64
8	0.51	3.94	2.00	0.56	86.7
9	0.86	2.75	2.4	0.89	27.58
10	1.14	8.76	9.86	1.26	167.48
11	1.11	4.53	5.16	1.18	88.66
12	1.77	7.73	14.59	1.89	153.7
13	1.64	13.01	21.45	1.82	179.32

h and **w** were extracted according to the scheme presented in the paper: *h* was extracted from the center of the profile height, and *w* was extracted from the full width at *h*/2.

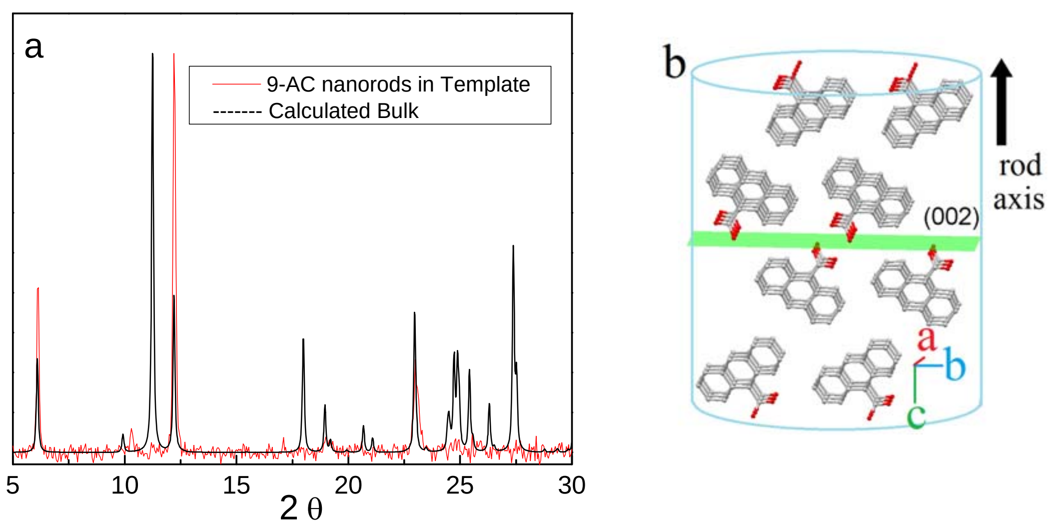

Figure S8. a) Powder X-ray diffraction patterns: (black) calculated pattern of monoclinic 9AC; (red) experimental pattern of 9AC nanorods aligned within the AAO template, with the two peaks corresponding to parallel planes (002) and (004) being most prominent; **b)**

crystal orientations of 9AC molecules within the nanorods, with the rod axis parallel to the c-axis of the unit cell. This is perpendicular to the long axis *l* of the microribbons.