

Three-Dimensional DNA Origami



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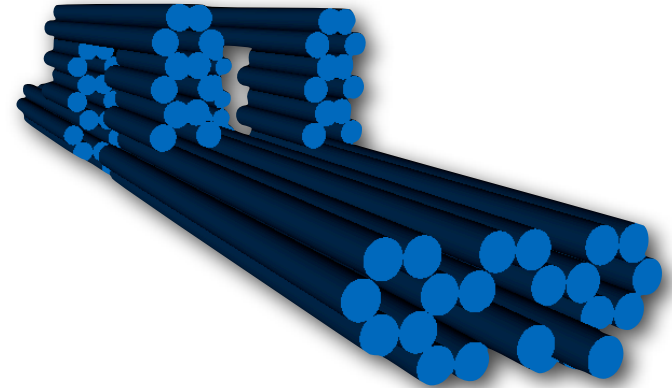
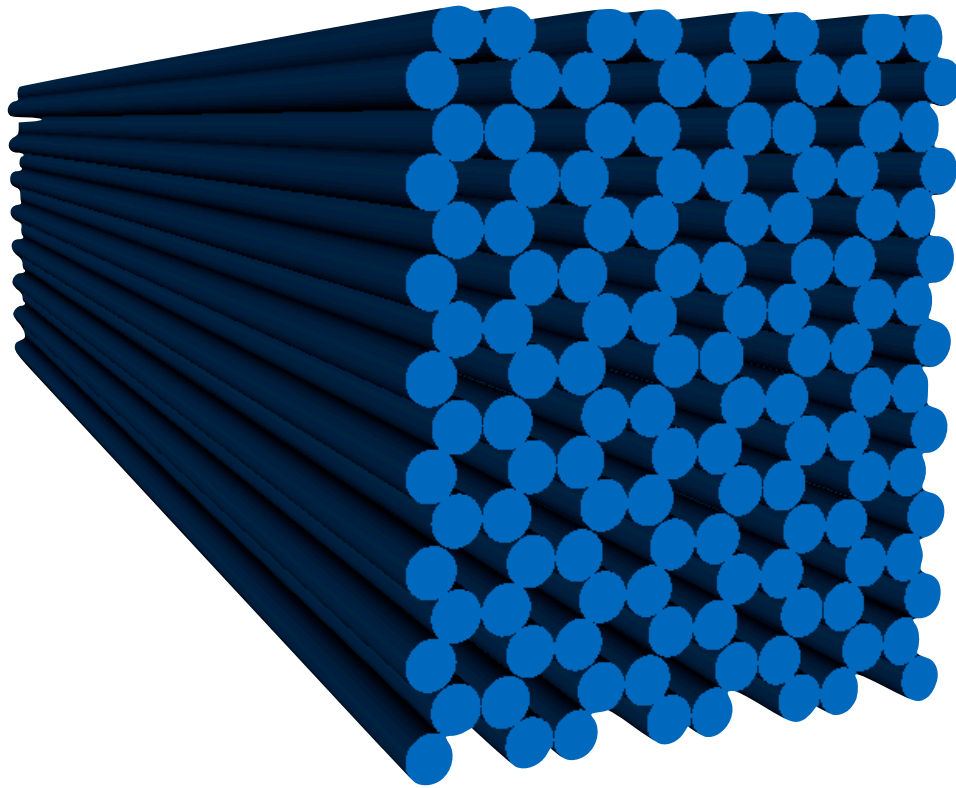
2009 April 8

ARGUMENT

We now have tremendous control
in self-assembling 3D shapes with
100 nm-scale dimensions and
sub-nm-scale features.

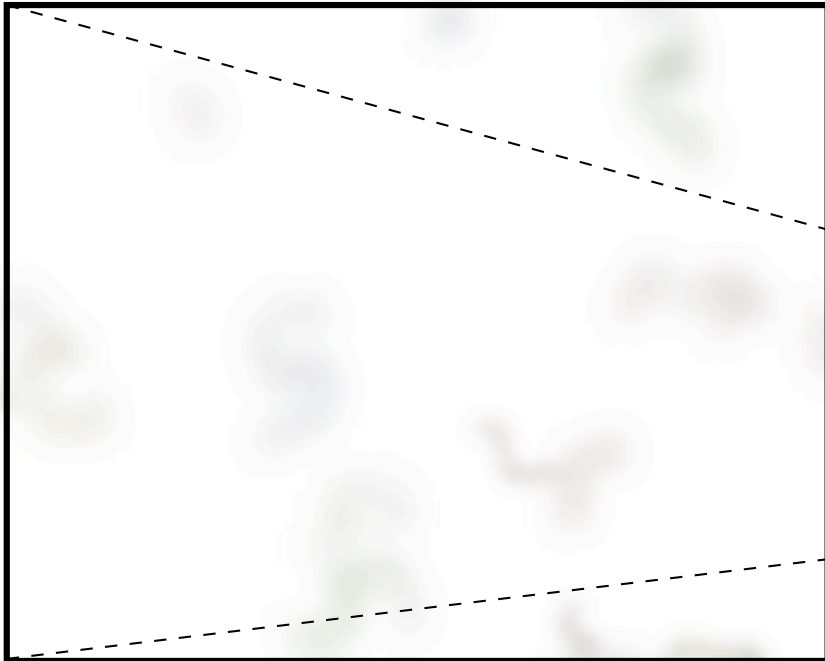
CONSTRUCTION PARADIGMS

- I. Sculpture from a honeycomb block
- II. Wireframe structures
- III. Pre-stressed wireframes and blocks

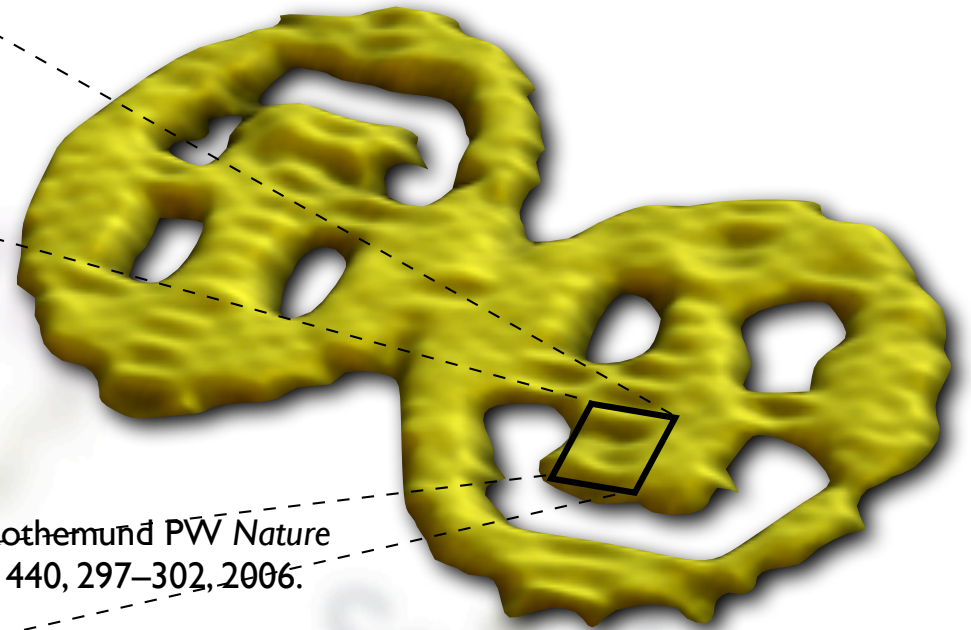


CONSTRUCTION PARADIGMS

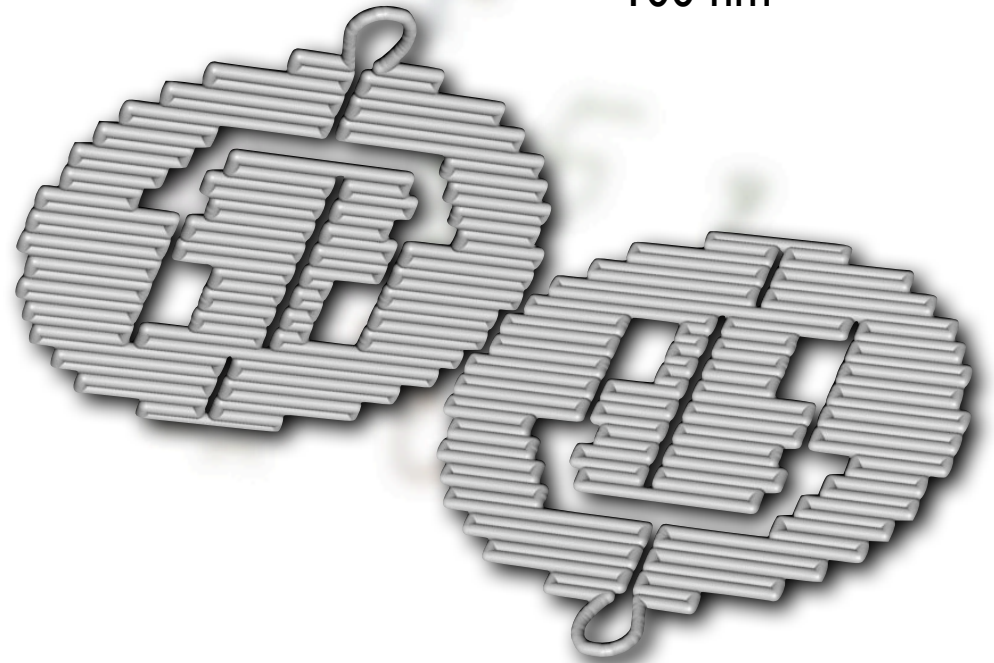
- I.** Sculpture from a honeycomb block
- II.** Wireframe structures
- III.** Pre-stressed wireframes and blocks

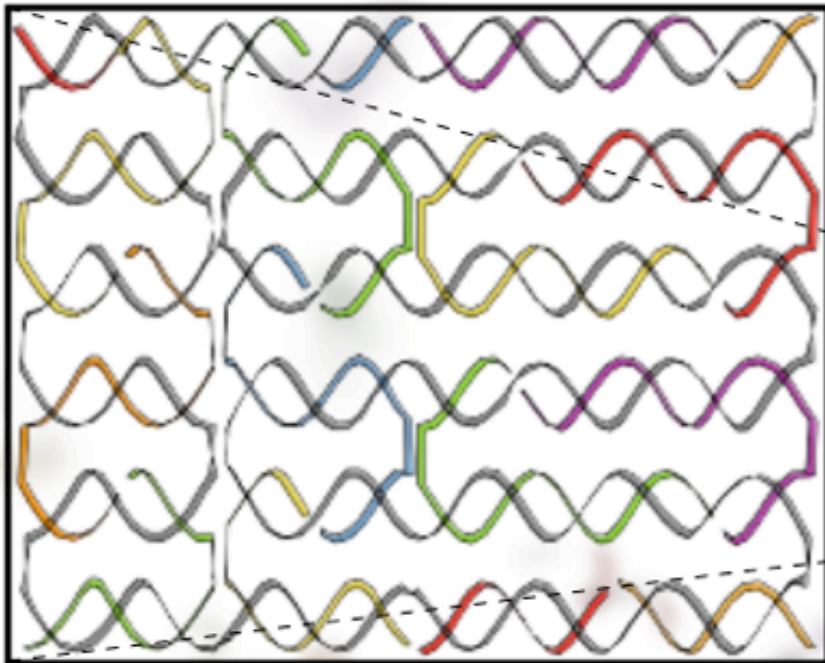


Rothemund PW *Nature*
440, 297–302, 2006.

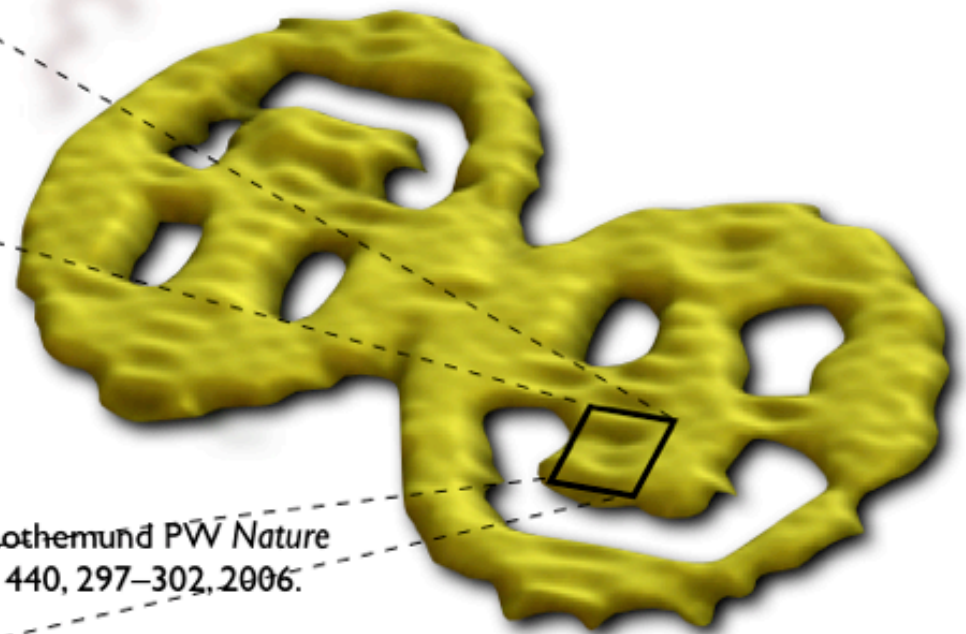


100 nm

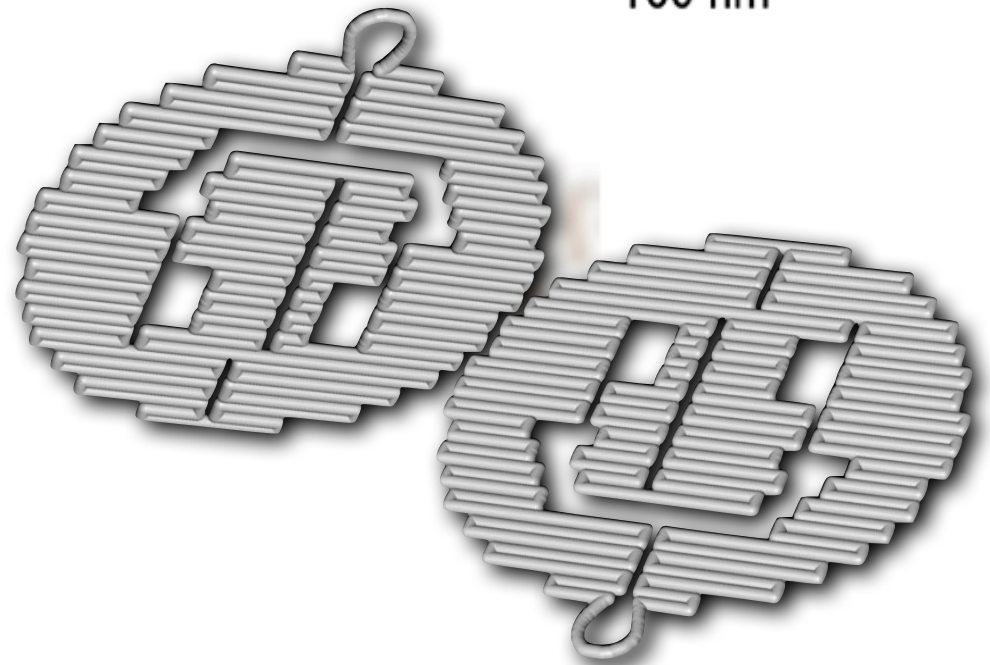




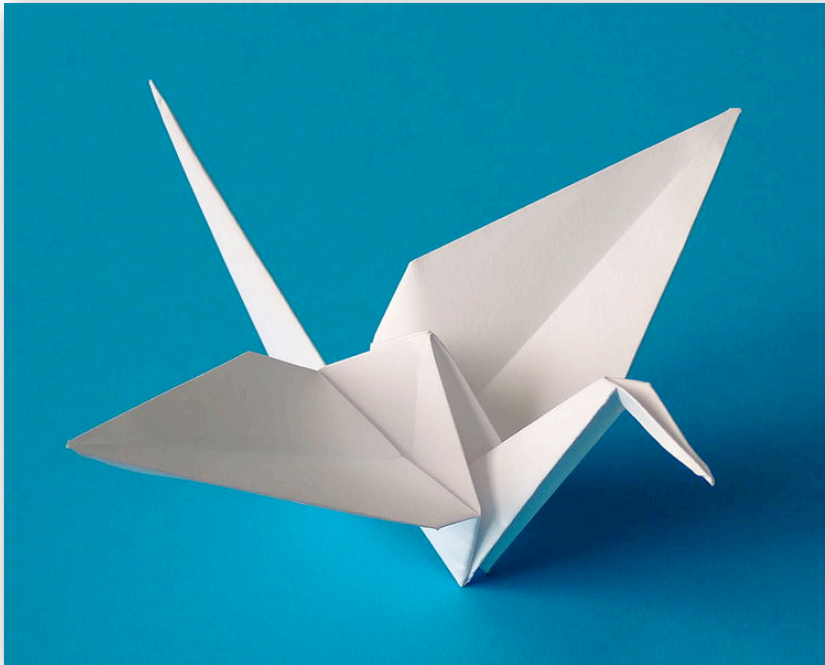
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100 nm



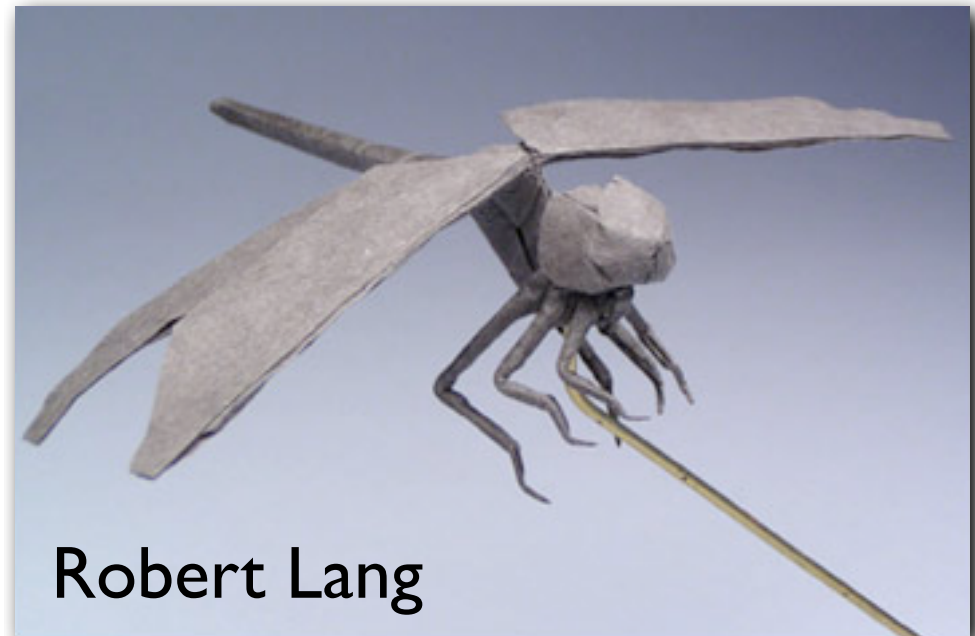
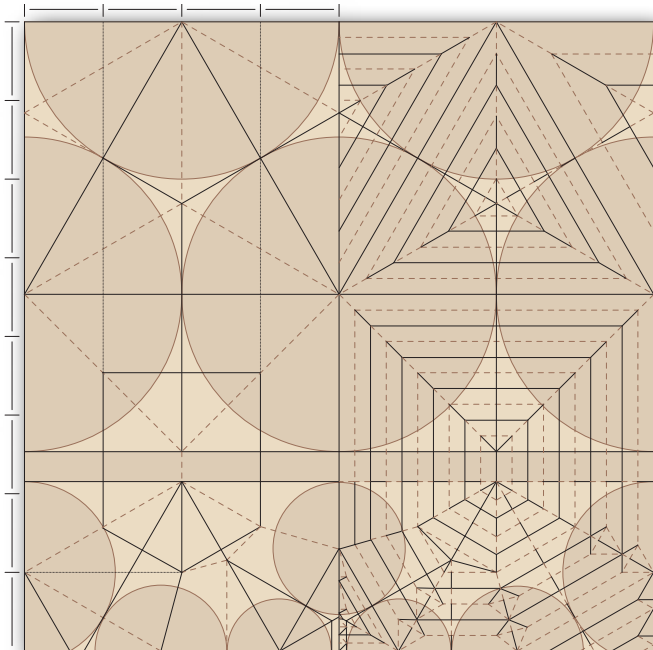
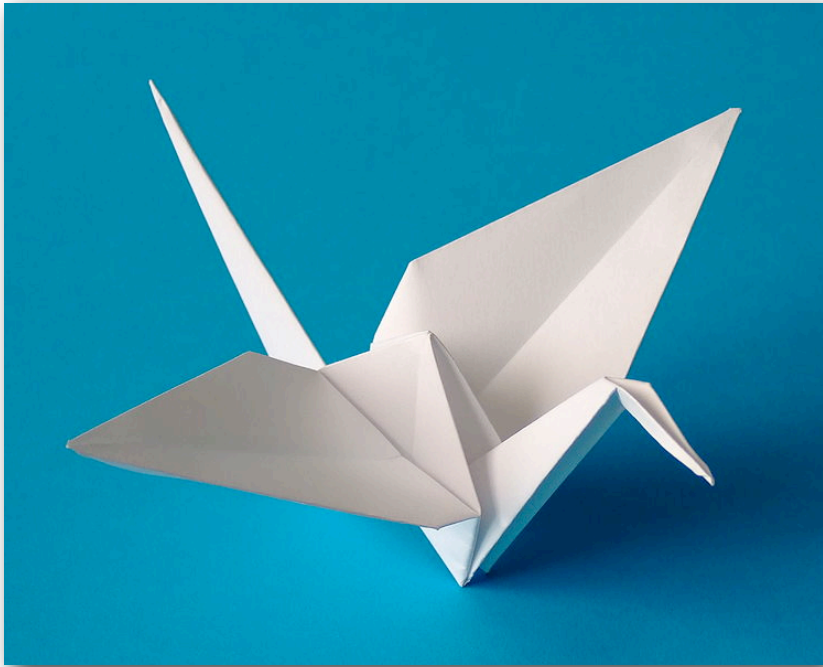
Flat sheets can be folded into 3D shapes

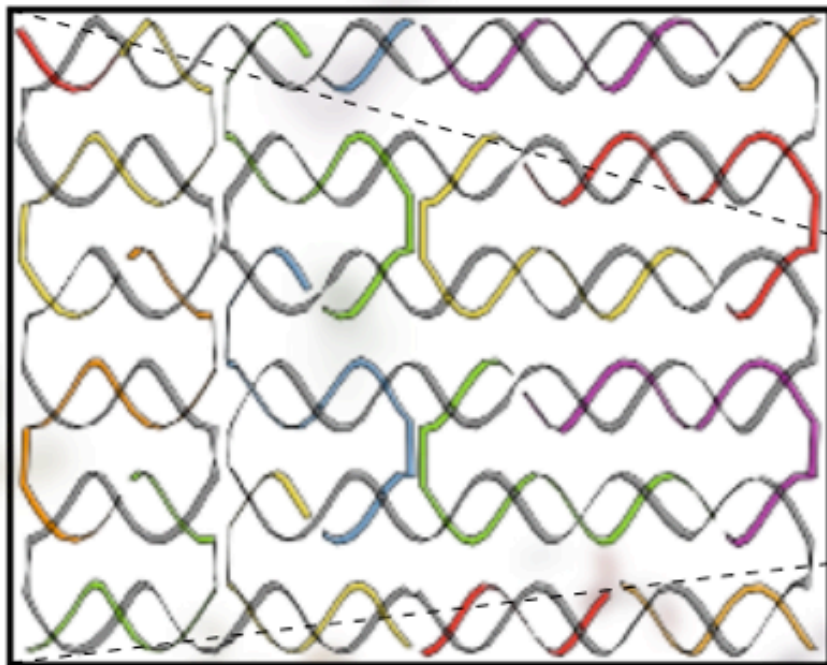


Origami

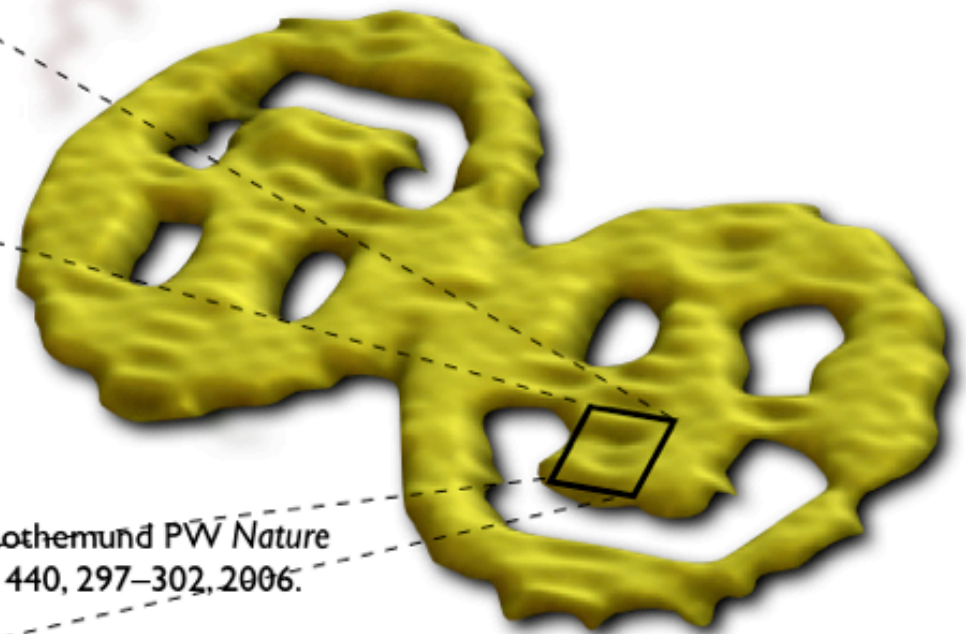
Japanese art of paper folding

Flat sheets can be folded into 3D shapes



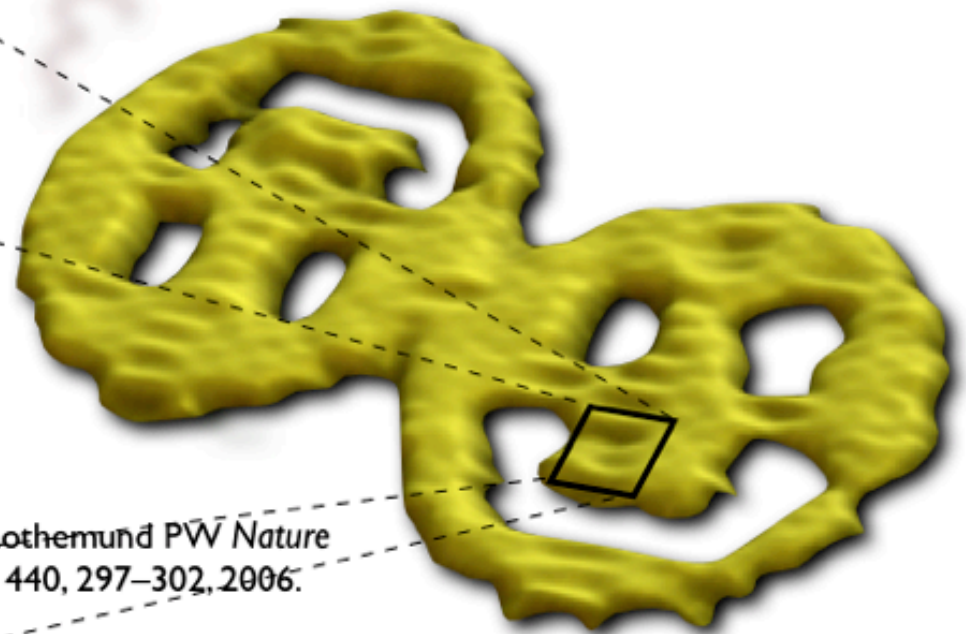
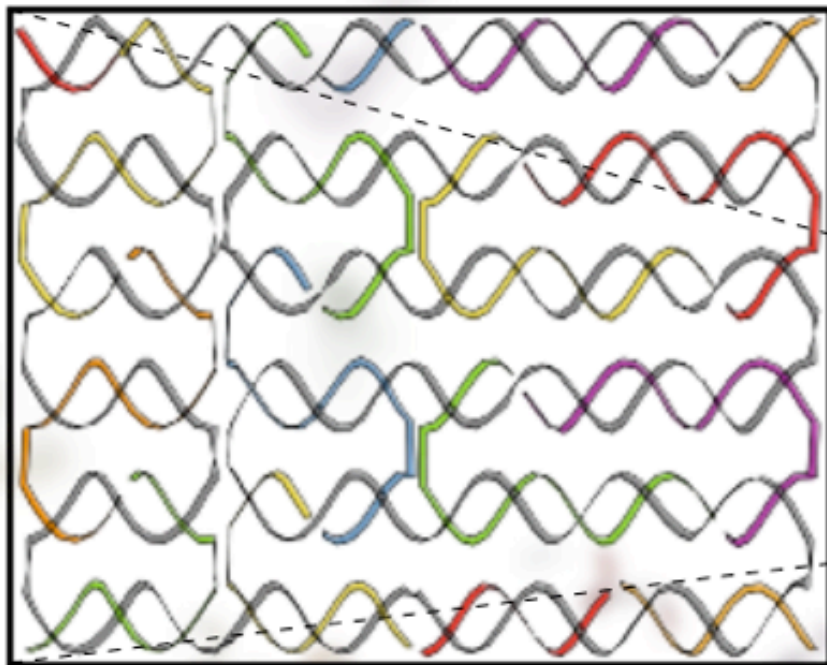


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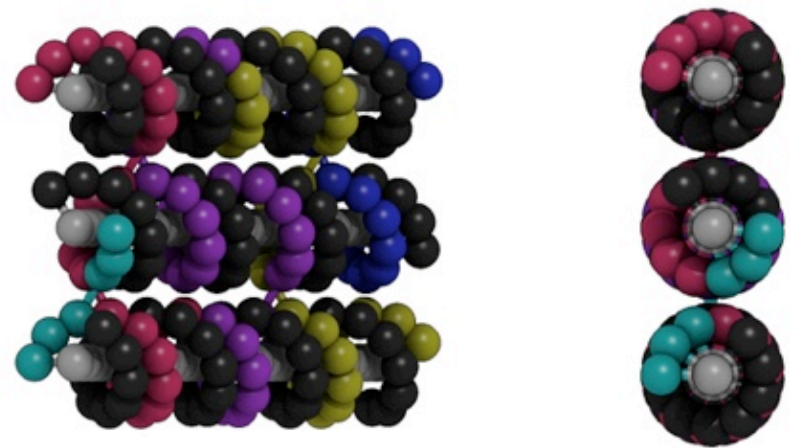
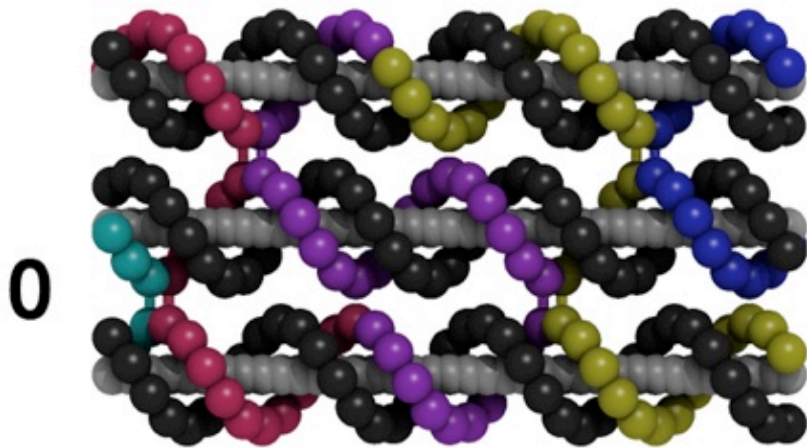
100 nm

Shawn Douglas



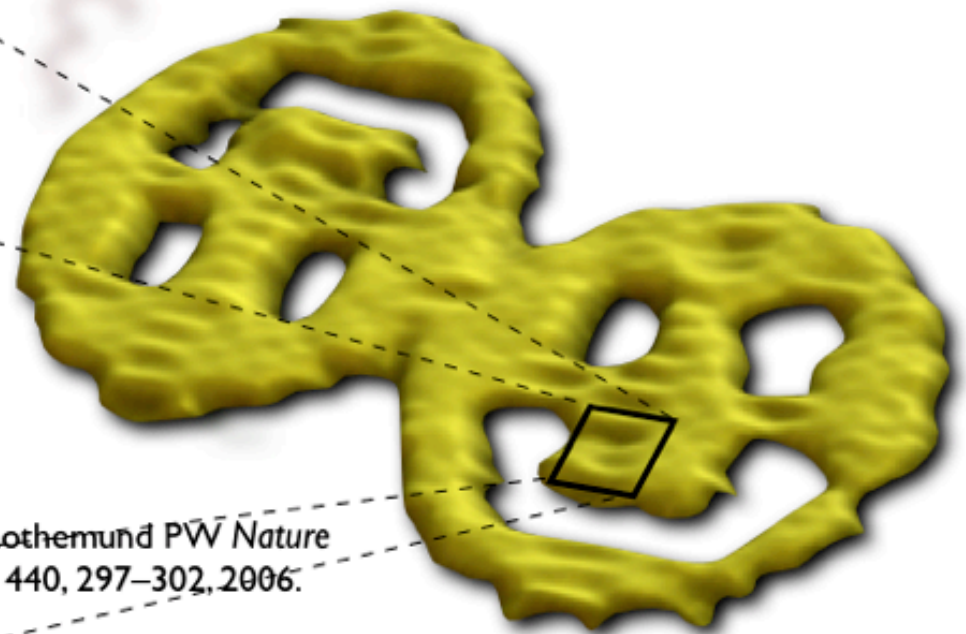
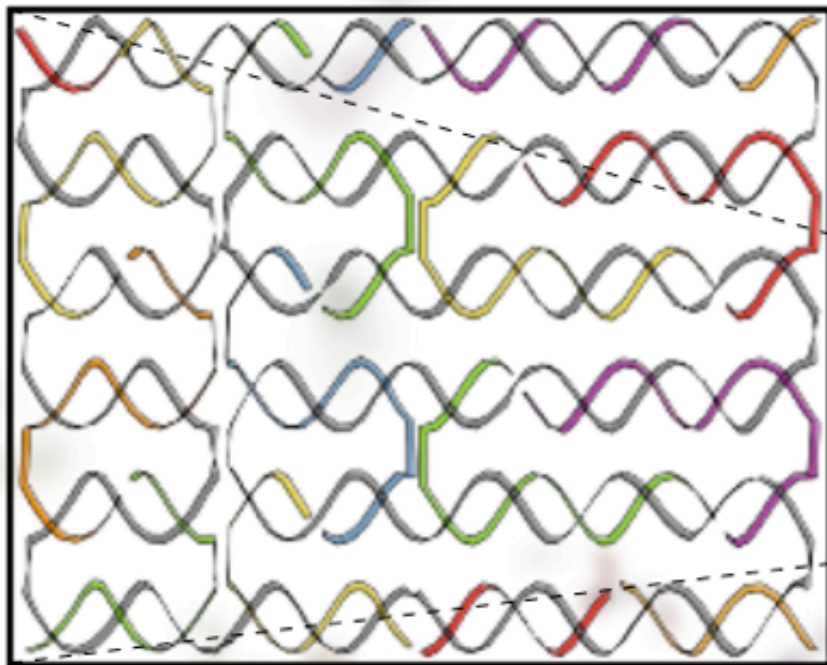
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100 nm



Damian Allis

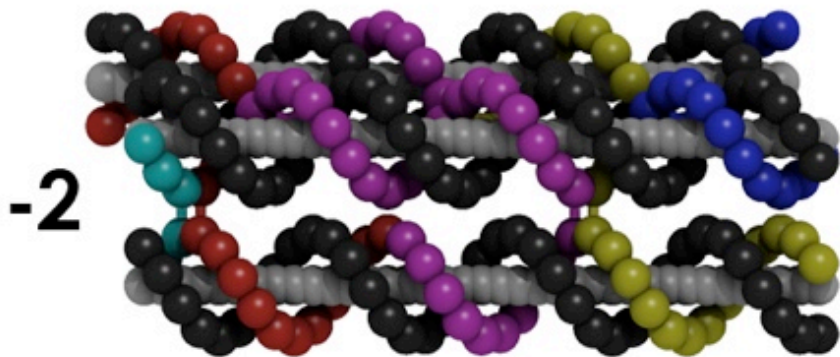
Shawn Douglas



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100 nm

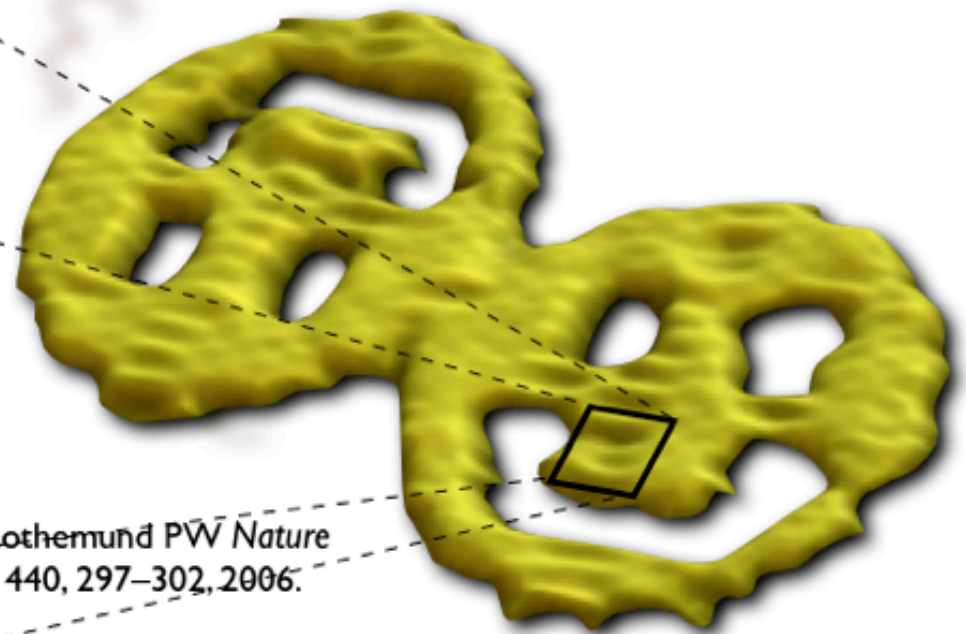
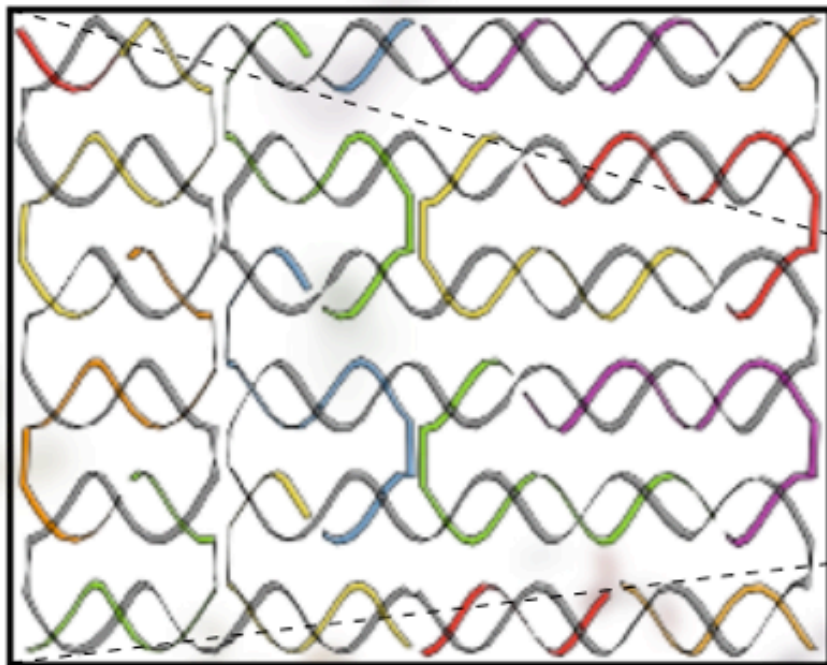


-2



Damian Allis

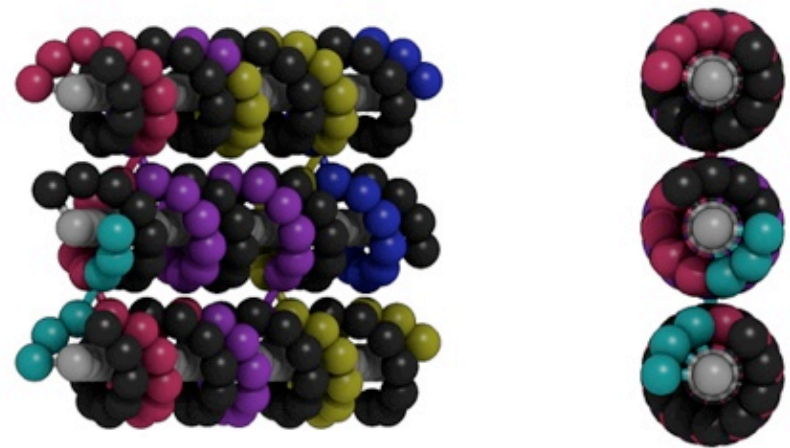
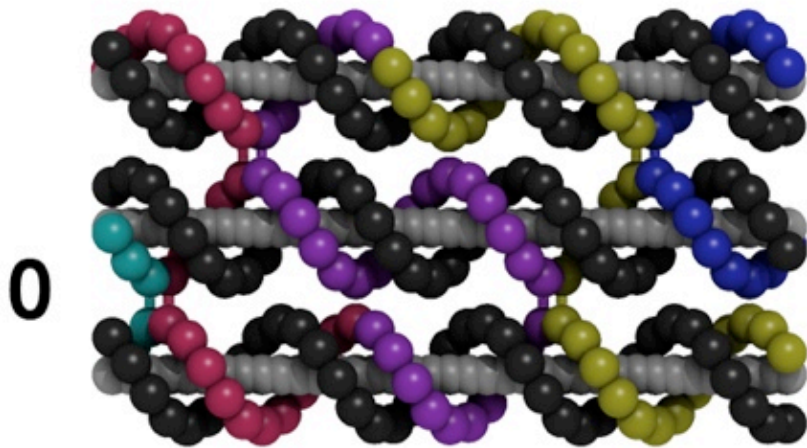
Shawn Douglas



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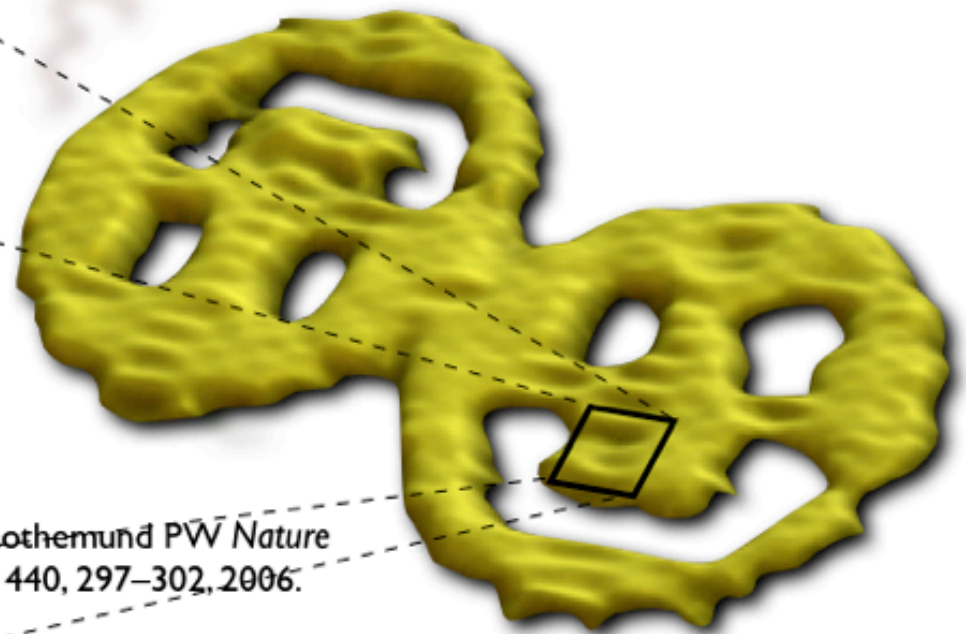
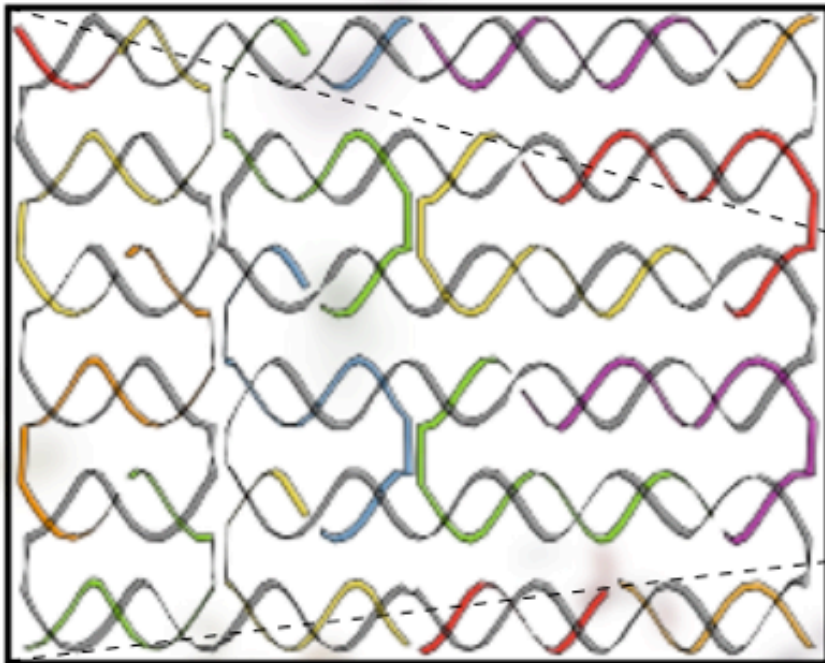


100 nm



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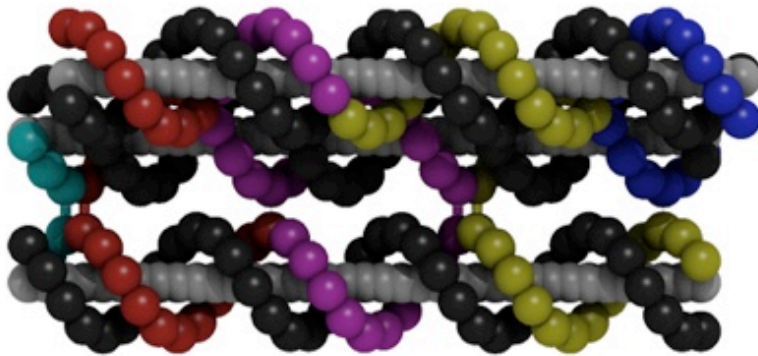


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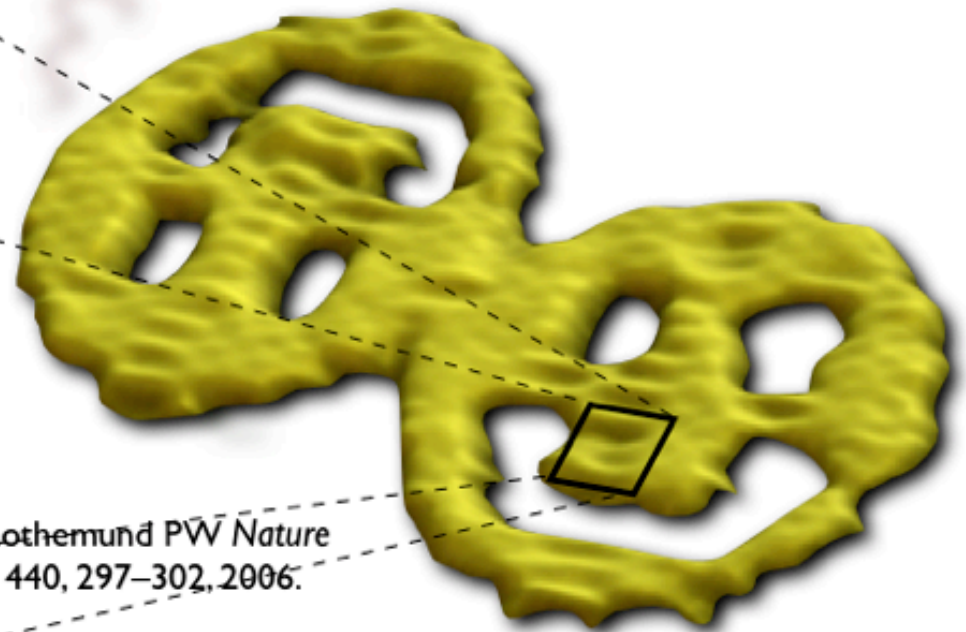
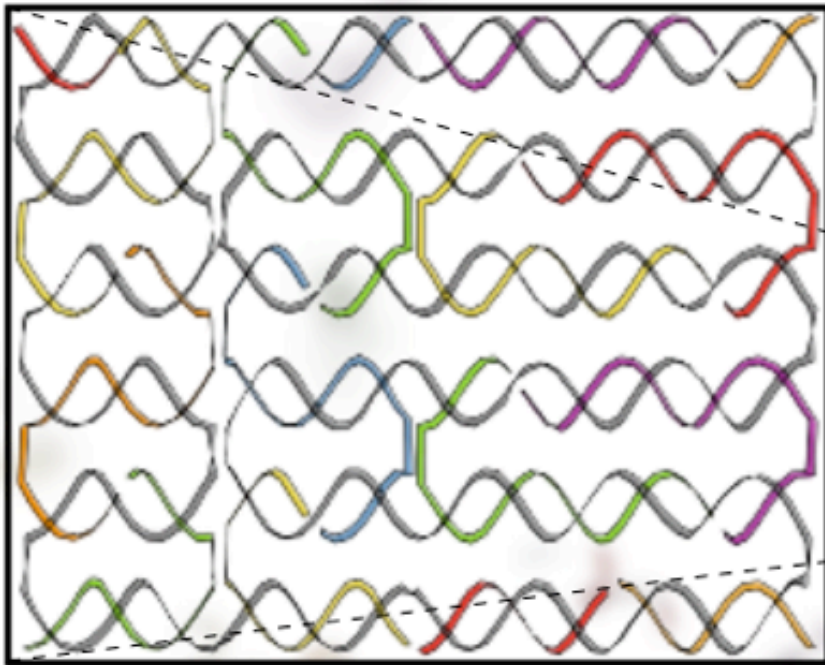
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+2



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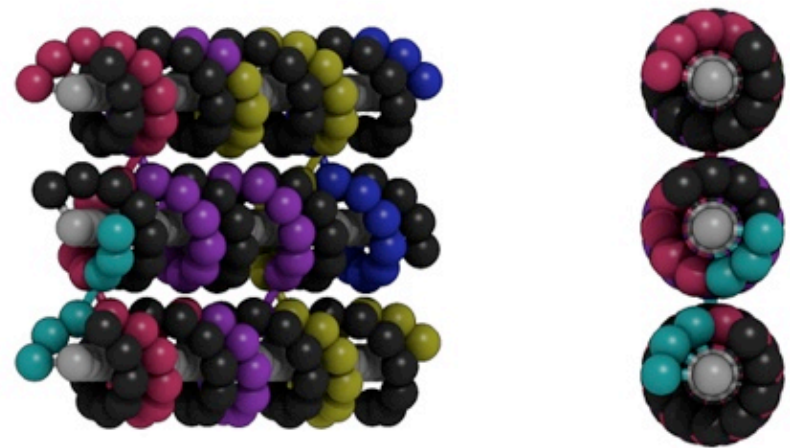
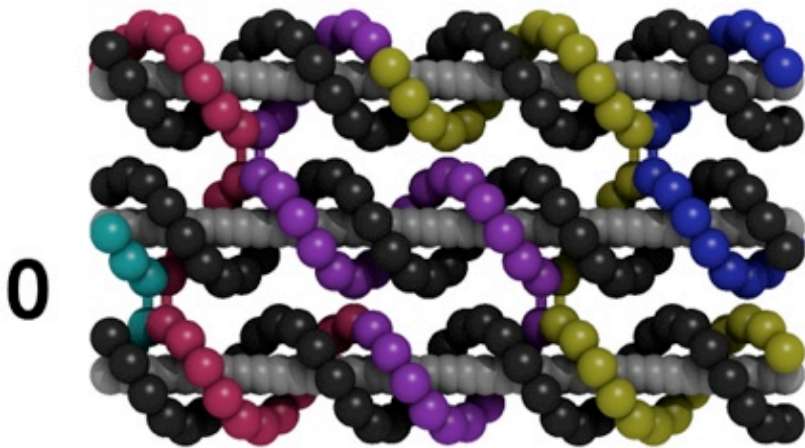
Shawn Douglas



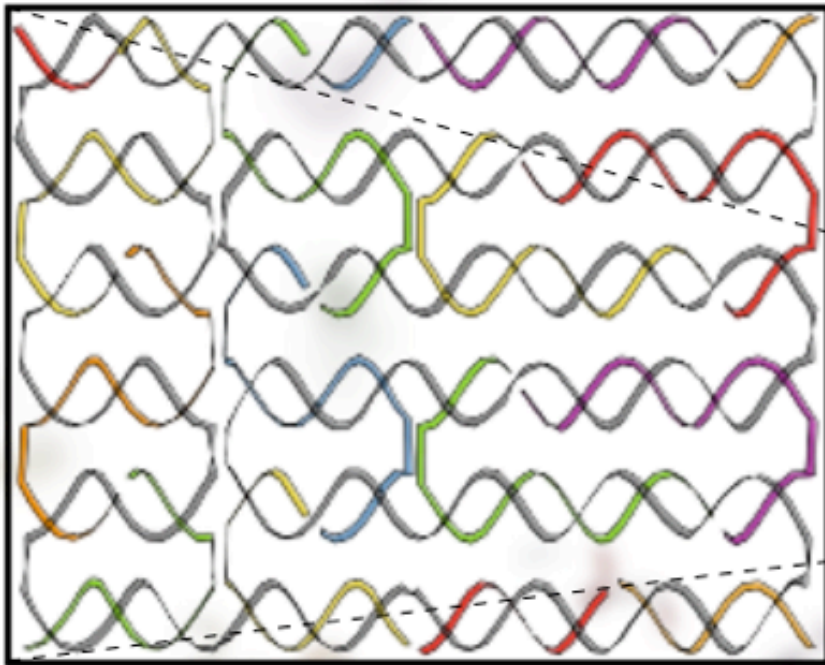
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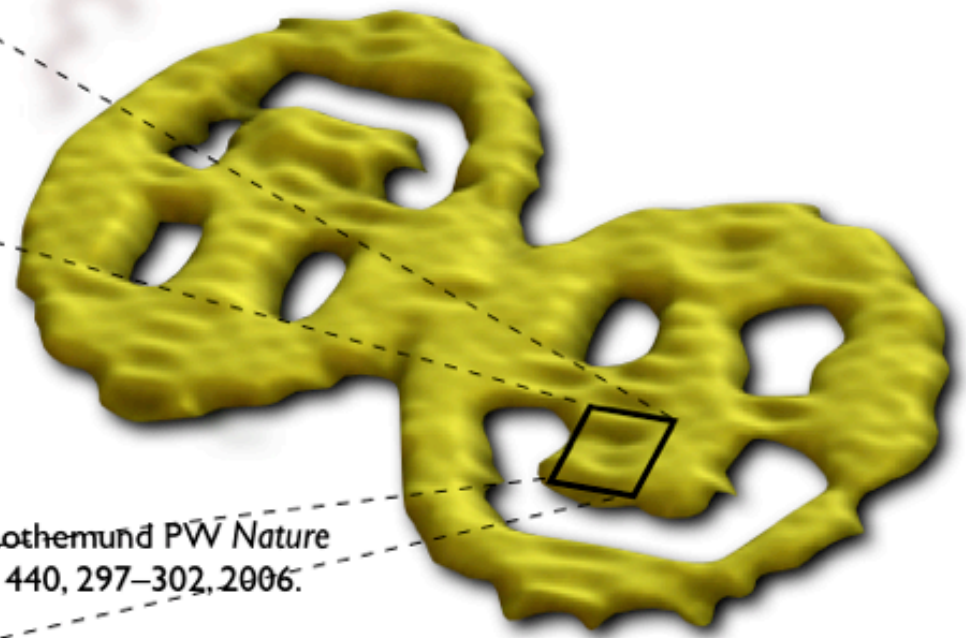
100 nm



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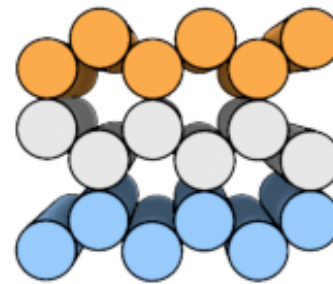
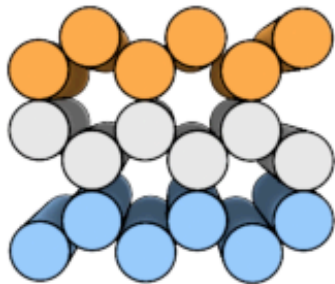
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100 nm



50



10 nm