

## NANO HIGHLIGHT

### Envisioning and Communicating Self-assembly

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Just as writing a science article encourages one to create an order of comprehension, so it is for the visual expression of the same ideas. With this in mind, we began a pilot outreach project with one of our undergraduate students, Marianna Shnayderman, to illustrate the following:

- the process of thinking of how to visually represent science and engineering *for the purpose of communication* enhances the understanding of scientific concepts for the creator, in this case our undergraduate student.
- discovering an accessible visual language to communicate science to the adult and young public emphasizes to the next generation of researchers the importance of communicating to the public, making it a part of their education.

Marianna designed animations to communicate self-assembly in block copolymers (see the other Nano-Highlight from our group). The following is excerpted from Marianna's report:

"Visualizing concepts is probably the only way I can understand them; it's the only way science can make any sense to me. In this project I created animations that would explain concepts applying in lab for my senior thesis project. I had to read up on the science from various textbooks and then had to figure out how to put all the concepts together for two kinds of audiences—high school students and adult non-scientists:

what is meant by the "nano" scale?

what are block copolymers?

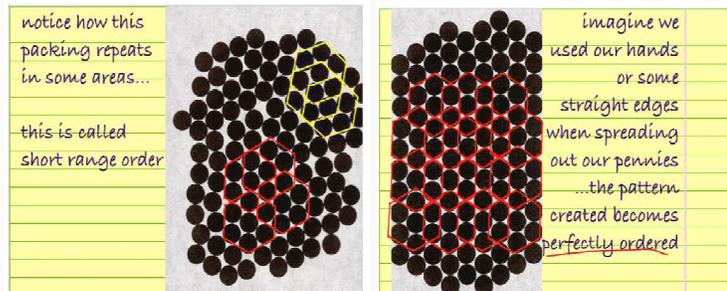
what is self assembly?

what is templated self-assembly?

The thought process was as follows: read descriptions, try to sketch the concepts, learn and use Flash software to actually animate the sketches, then meet with my advisor, Felice Frankel, over a period of time to discuss goals and communicative components.

After getting the animation to particular point, we then met with Professor Caroline Ross and her postdoc Joy Cheng to confirm accuracy. This last step was crucial in the learning process: coming to a teacher with a visualization of what I thought the science meant, made it possible for the professor to see where my thinking was wrong and what had to be explained differently. **The animation became an interface for learning.**

When I became responsible for teaching others about the concepts through animation, I felt that I really had to understand what I was talking about and learned a great deal from the process. In addition, it was a wonderful opportunity to meet directly with faculty and graduate students. I found that they also were challenged by thinking of what was the best way to represent ideas, specifically, how deep should we have to go with some of the explanations."



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Stills from one animation on templated self-assembly