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Joanna A. Ellis-Monaghan* (jellis-monaghan@smcvt.edu), Saint Michael's College, One Winooski Park, Colchester, VT 05439. *New Problems in Graph Theory from Self-Assembly*.

Newly emerging technologies in self-assembly, both at the nanoscale with for example DNA origami, and the macroscale with for example robotic assembly, are now generating fascinating and challenging new design problems for which graph theory is a natural tool. Because this is a new area, many aspects require 'first principle' approaches—hard, creative thinking and serious problem formulation work, but a fairly manageable ramp-up—and hence it is particularly suitable for undergraduate involvement. Furthermore, the work is highly interdisciplinary, with research teams frequently including professional collaborators and students from mathematics, computer science, physics, biology, and even English and art.

We will present some of these new applications in self-assembly and describe some of the graph-theoretical design strategy problems arising from them. We will describe how we achieve substantive and pragmatically useful results with students who may join the group with very little mathematical background. We will also share our experience in identifying, establishing, and funding such a project, and how it may be used for recruitment of mathematics majors and minors. (Received September 12, 2016)