UNDERGRADUATE MATH SEMINAR

The next math seminar of the term will be

DATE: <mark>THURSDAY, October 27</mark>

Time &   **12:30 –** Pizza in **Bailey 204**

Location: **12:50 – 1:45** Seminar in **Bailey 207**

In this seminar, Union College Professor of Mathematics, Emeritus, **William Zwicker** will present the following talk about joint work with Ayumi Igarashi of the University of Tokyo, Japan.

Professor William Zwicker

Title: Fair Division of Graphs and of Tangled Cakes

Abstract: Union's newest building, Mainly Hall, will be shared by the three most venerable and prestigious academic departments: Mathematics, Philosophy, and Physics.   The dean wishes to assign the new offices to faculty in these three departments, in such a way that

- no department prefers the set of offices assigned to a different department, and
- members of any one department can walk among offices assigned to faculty in that department without needing to walk past offices of faculty in other departments.

Does such an assignment always exist?

Fig. 1: Nine tangles. Top row contains the six basic stringable tangles.

Fair Division studies how to share some common resource among several agents in a way that is "fair." In *Fair Division of Graphs*, vertices of a graph are allocated to the agents in such a way that each agent's share is contiguous (the induced subgraph is connected). Applications include the imaginary problem above, as well as some more realistic ones. We answer some previously open questions on graph fair division by introducing *tangles* – an even newer context fair division.
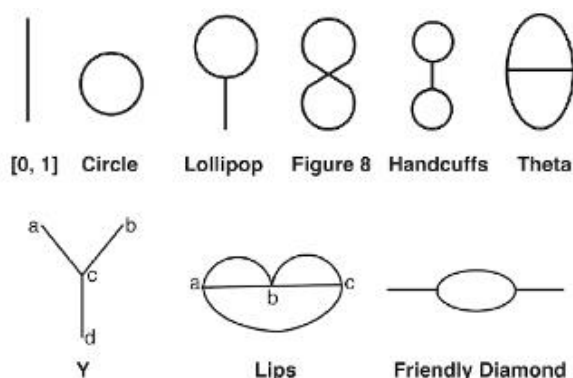
The Association of Women in Mathematics Presents Friendsgiving!

On **Wednesday, November 2** from **5:00-6:30pm** in the lounge at **Green House**, come get dinner and meet other students and professor in the Math Department at an informal "Friendsgiving", hosted by the Union College chapter of the Association of Women in Mathematics (AWM).

If you have any questions or are interested in joining AWM, email **Professor Ellen Gasparovic** (gasparoe@union.edu).

Interview Question? If not, at least it is a fun math problem!

In a recent article posted on Medium.com, a professor(?) shared a problem that they claim one of their students was asked at "an interview for an internship at a very prestigious investment bank." Regardless of whether or not this is true, the problem is fun. Give it a shot!

Question: If $a + b = 1$ and $a^2 + b^2 = 3$, calculate $a^8 + b^8$.

If you solve this problem and want fame and glory (well, at least recognition in an upcoming math newsletter), submit your solution to **Professor Paul Friedman** (friedmap@union.edu) by **noon on Friday, October 28**.