Research with Amy Graves
Summer 2019

- Condensed matter physics
- Computer simulation
- Specifically:
  Soft matter: Jamming
  Phase transitions
- Looking for 1 or 2 students
- Start Spring or continue in Fall 2019?
- Write a paper and/or a thesis?
What kinds of **systems** do we model?

- “System” refers to a large number of interacting entities
- sand
- grain
- foam
- human cells
- living creatures
- …

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-A. Siemens and M. van Hecke, 2010

-Time magazine, 2012

“The Culprit in a Tragic Human Stampede: Physics”
“Jammed” means that particles enter into a disordered, yet rigid, state which can withstand pressure and shear forces without yielding.

-A. Siemens and M. van Hecke, 2010
Example of a phase transition: jamming

“Jammed” means that particles enter into a disordered, yet rigid, state which can withstand pressure and shear forces without yielding.

-L. Oswald et al, 2017
Jamming involves both **stat mech** and **classical mech**: The jammed state is one of stable mechanical, equilibrium.

-Tang and Behringer, 2011
Structured randomness: Jamming in a pinning lattice

Thesis data: Prairie Wentworth-Nice, ‘18
Structured randomness: uses C++
Vibrational spectrum? Mechanically stable states?

M. L. Manning Group
U. Syracuse ‘18

Summer ’18 data of
Brian Jenicke’20 and Tristan Cates ’20
Flows of inert and active matter

-L. Silbert and G. Grest
Pedestrian flows

- Project 3: uses EJS or Python

Invited journal paper ("Entropy") in progress: Rachel Diamond '18, Jimmy Shah '18 and Eduard Saakashvili '17

-I Zuriegel et al, 2014
If interested in our work, put my name on your preference form.

You are welcome to see me for more information.

Possible / definite work times:
* Work with me (8-10 hours/week) April 15 - May 13, 2019
* Independent work June 17-21
* **Work with me June 24 - Aug 9**
* Work with me (8-10 hours/week) Fall, 2019