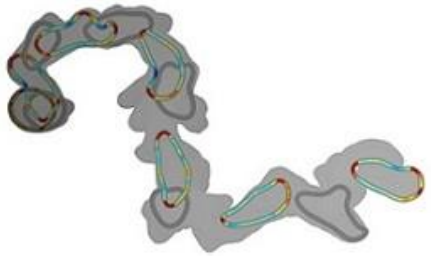
Physics 131- Fundamentals of Physics for Biologists I



Office Hours:

12/12 Thursday 2.15pm-3.30pm Course Center

Question and Answer Session during Reading Day:
Saturday 4pm-5pm

12/15 Monday 4-5pm My office AV Williams 3341

12/15 Monday 5-6.30pm Course Center

Research Experience

Topic: Intracellular Dynamics During Cell Division

OPEN Spring 2014: three credit course **Quantitative Life Sciences Research Experience** - Physics299L

Meets Friday 2pm-4pm plus in small groups one more time during week

NIH Postdocs as Co-Instructors

1-2 visits to NIH for experiments

Skills from 131:

- *Image/motion analysis*
- *Tackling tough problems in groups*

Admission is by permission of the instructor. We have 24 slots for the 240 Phys131 students, (you gets first dibs ☺)

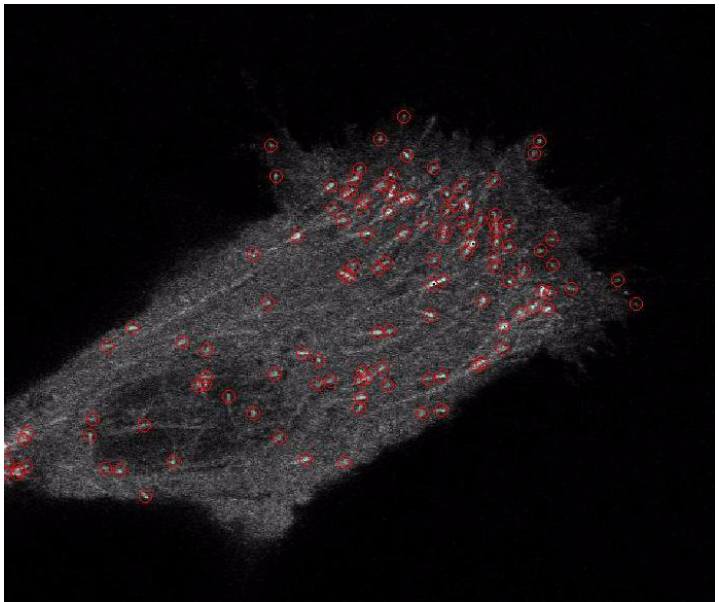
For questions, or to apply, email me

wlosert@umd.edu I need:

1) Name

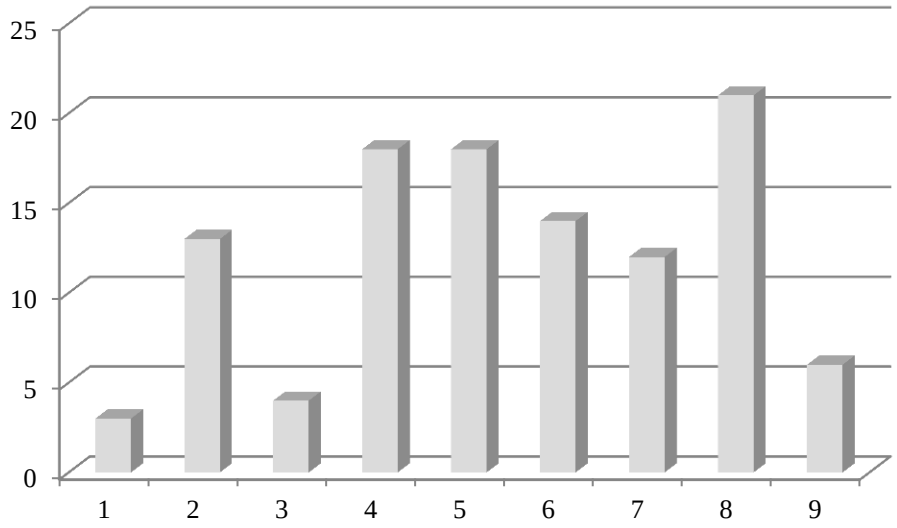
2) Univ ID,

3) ***One paragraph explaining what you hope to learn from this Research Experience, and how it will help your career.***



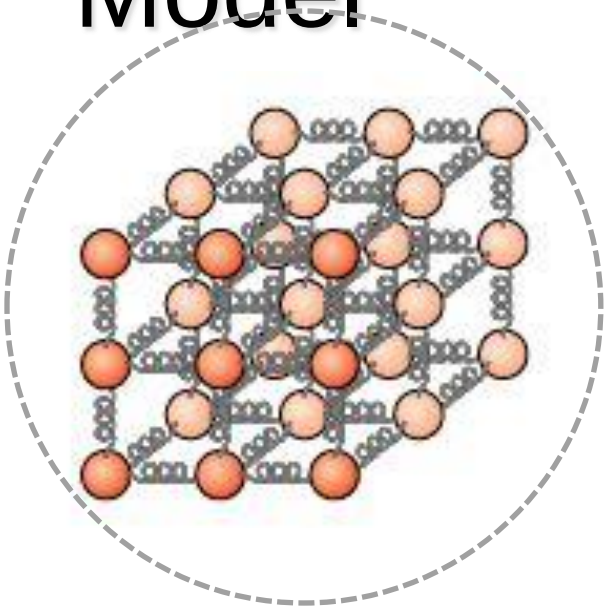
Quiz 11

Ave: 5.5

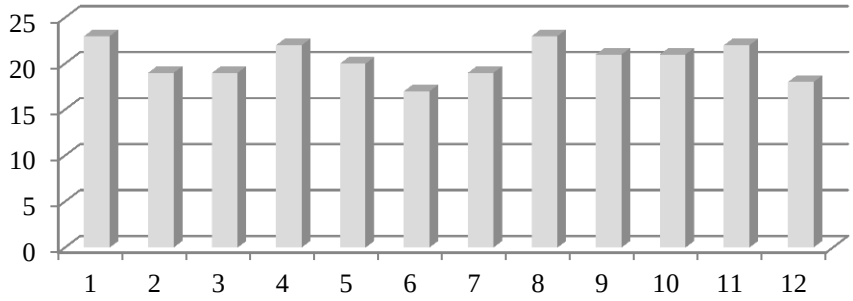


Temperature Model

Object A

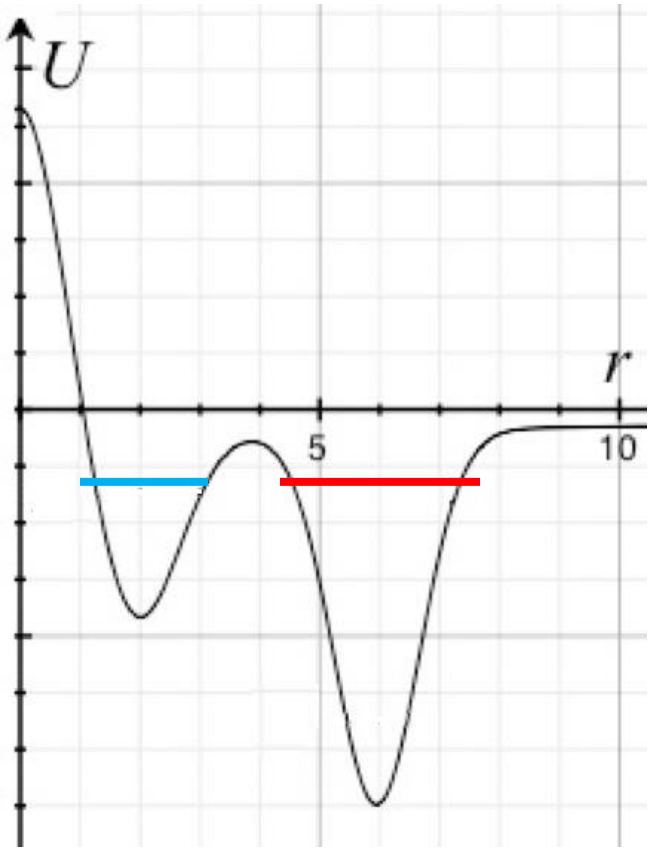


Object contains MANY **atoms (kinetic energy)** *and* **interactions (potential energy**)



- **Temperature:** Measures the amount of energy in each atom or interaction – the key concept is that thermal energy is **on average** equally distributed among all these possible "bins" where energy could reside.
- **Note: Potential energy of each bin is here defined so that the minimum of the Potential Energy Curve is zero.**
- **Thermal energy of object A :** Measures the energy in the whole object. Depends on temperature and the number of "bins" where energy could reside.
- Average energy in each bin: ½ kT

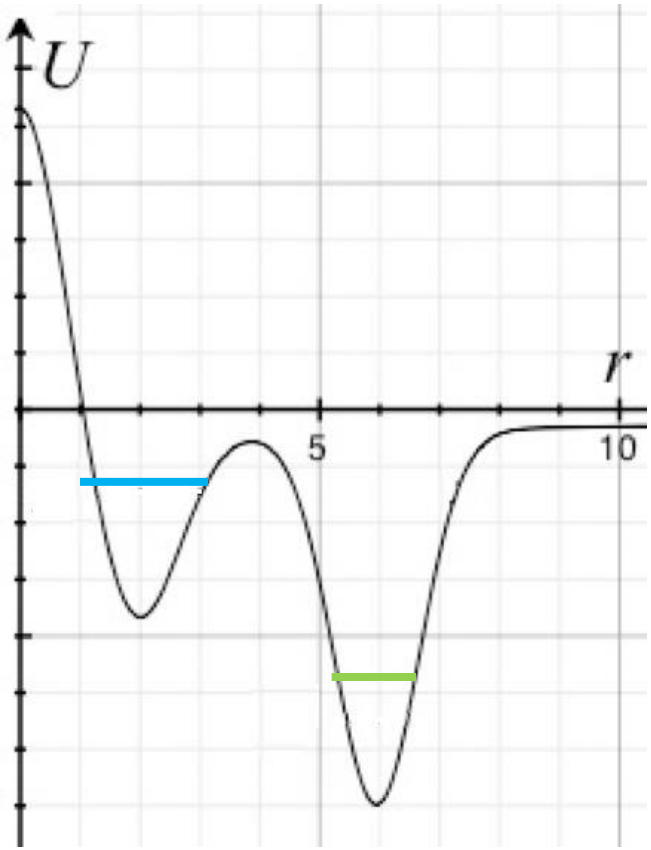
Implications of our temperature model



- Assume a molecule with a complicated Potential energy curve (top right, potential energy vs distance between molecules). The molecule get knocked from the blue state to the red state.
- **Does the total energy change?**
- **What about the molecule's thermal energy?**

Whiteboard, TA & LA

Equilibrating temperature in our model



The molecule started in the blue state in thermal equilibrium. The green state has the same temperature as the blue state.

- **How can we tell that the two states are at the same temperature?**
- **Is the potential energy different in blue and green state?**
- **What would you call such a reaction chemistry? (write name on whiteboard)**

Whiteboard, TA & LA