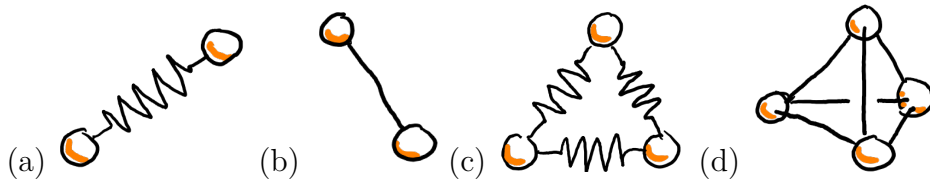


If the microscopic world was classical, predict  $U_{\text{classical}}(T)$  for the following “toy molecules” in the gas phase.



- Each ball is a point mass  $m$  with no moment of inertia.
- The zig-zag lines are springs which are freely jointed at the balls.
- Vibrational motion of the springs is very small ( $\ll$  the length of the spring).
- The springs can extend and compress, but cannot twist or flex.
- The straight lines are rigid rods.