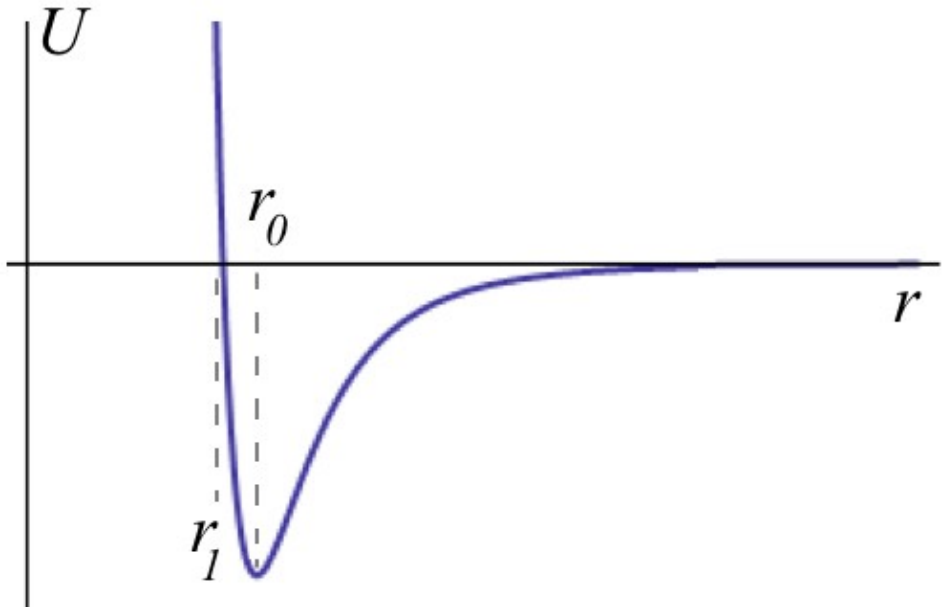
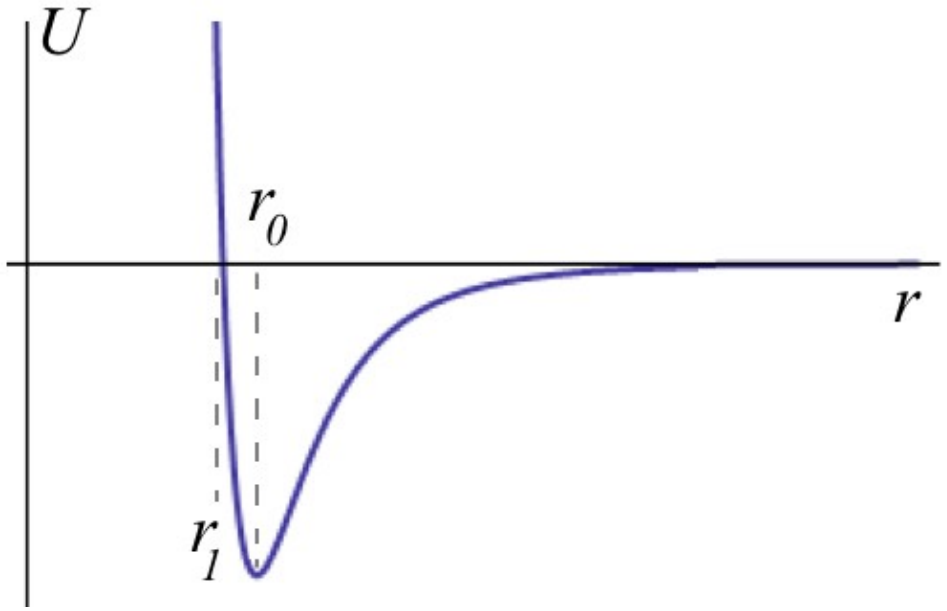
The figure shows the potential energy of two interacting atoms. The point with the minimum value is r_0 and the point where the curve crosses 0 is r_1. Where is the force between the two atoms the largest?

1. At r_0.
2. At r_1.
3. At fairly large values of r.



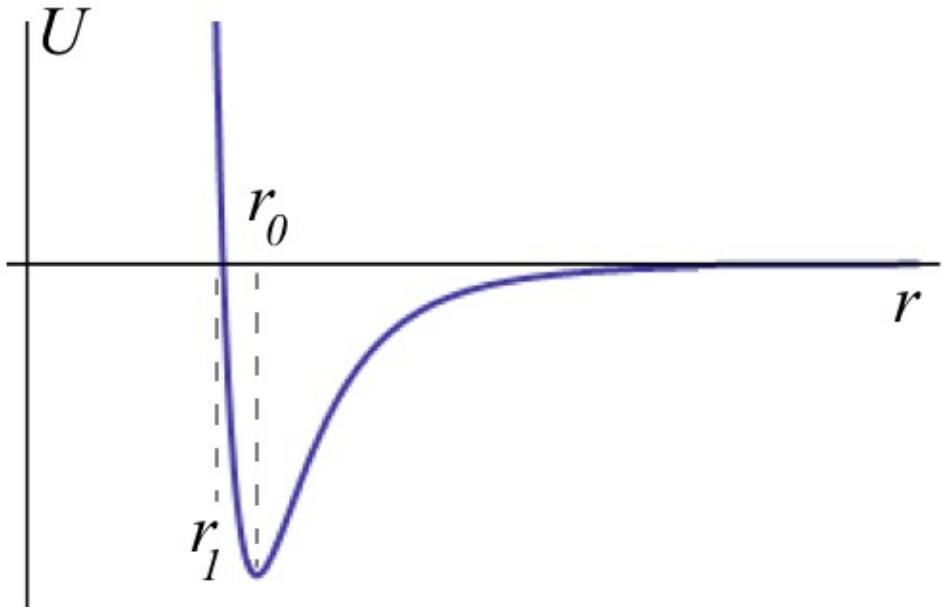
The figure shows the potential energy of two interacting atoms. The point with the minimum value is r_0 and the point where the curve crosses 0 is r_1. Where is the force between the two atoms repulsive?

1. Between r_1 and r_0.
2. Between r_1 and ∞.
3. Nowhere.

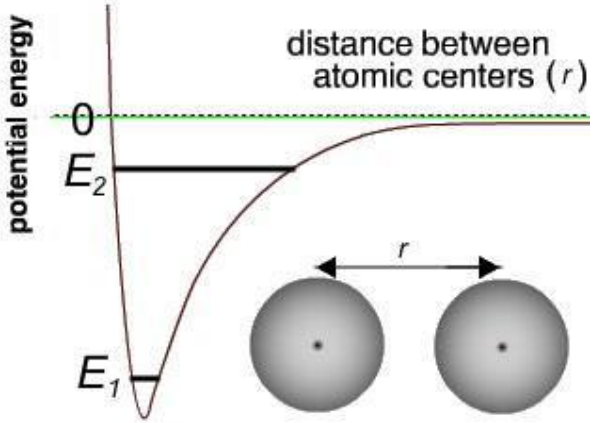


The figure shows the potential energy of two interacting atoms. The point with the minimum value is r_0 and the point where the curve crosses 0 is r_1. Where is the force between the two atoms attractive?

1. Between r_1 and r_0.
2. Between r_1 and ∞.
3. Nowhere.



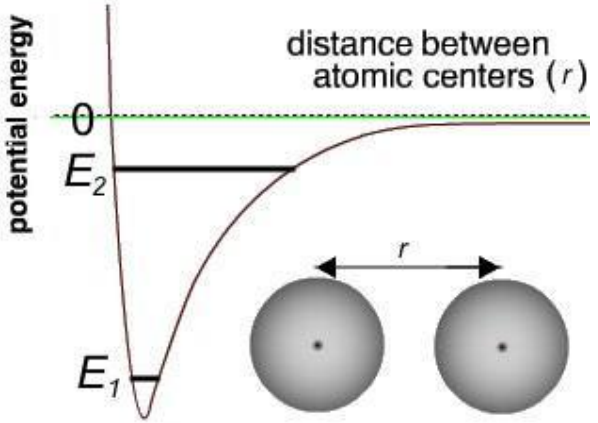
Two atoms interact with a potential energy between them that varies as a function of their separation as shown in the graph at the right. We take the zero of energy to be when they are very far apart and at rest. They have a total energy E_1 as shown on the figure. Which of the following statements are true about them?



A. They are in a bound state.
B. The total energy of the molecule is positive.
C. The total energy of the molecule is negative.
D. The total energy of the molecule is zero.

1. Only A
2. A and B
3. A and C
4. A and D
5. Only B
6. Only C
7. Only D

Two atoms interact with a potential energy between them that varies as a function of their separation as shown in the graph at the right. We take the zero of energy to be when they are very far apart and at rest. They have a total energy E_1 as shown on the figure. Which of the following statements are true about them?



1. To pull them apart, you would have to put in an energy E_1.
2. To pull them apart, you would have to put in an energy $-E_1$.
3. By pulling them apart, you would gain an energy E_1 that you could use elsewhere.
4. By pulling them apart, you would gain an energy $-E_1$ that you could use elsewhere.

The Gauss gun

Spheres numbered 1, 2, and 3 all "stick" when added one at a time. Which is more tightly bound?

1. Sphere 1
   (when 2 and 3 are NOT there)
2. Sphere 3
   (when 1 and 2 ARE there)
3. They will be the same.

The Gauss gun

When sphere 0 is released it is attracted to the magnet and begins to speed up. What do you think will happen when it hits the magnet?

1. Sphere 0 will stick.
   Nothing else will happen.
2. Sphere 3 will be kicked off at the same speed that sphere 0 hit with and will slow down to a stop – reversing what 0 did as it approached.
3. Something else will happen. (What?)