

# SEMINAR IN PHYSICS

FRIDAY, MARCH 9, 2018

3:30-4:25 · Ross 0220

## **Promising Applications of Graphene and Graphene-based Nanostructures**

Hayden Kembel  
UNC Physics Major

The discovery of graphene may be the key to a more advanced future with a wide range of promising applications. This presentation will go over some of graphene's remarkable electrical properties that make such new and revolutionary ideas possible. Some general applications that will be discussed include transparent and flexible conductive films, conductive inks, separation membranes, bio-medicine, and energy storage devices.

## **Probing the Casimir Force With Optical Tweezers**

Tyler Onufrak  
UNC Physics Major

Classically, when two small objects are moving towards each other, there is very little to no force between them. As you move them until they are just nanometers apart, however, there is an attraction between the two objects. You may think that this attraction may be due to the force of gravity and as they approach smaller distances between them, the force grows. While being correct, that is not the force that is making these two objects connect. To figure out what causes this attraction, we have to look into quantum physics, at the Casimir Effect.

To explore the Casimir Effect more, one looks at how the attraction between two microspheres interact with each other while only nanometers apart. Optical tweezers are used on the smaller of the two spheres to achieve the best data for demonstrating the Casimir Effect.