

## STEM in the News

Recently, scientists working for Nature Magazine have discovered a strange quirk of the laws of thermodynamics. Using the Casimir effect, they have successfully transferred heat through a vacuum without radiation. To do this, they suspended two gold plated silicon-nitride membranes a few hundred nano-meters across. They pulled the air out of the chamber and heated one membrane to a temperature about twenty-five degrees Celsius above the other, and recorded that both membranes began to even out to the others level. This is due to transient electromagnetic waves, that fill “empty” space. Albeit only for a fraction of a second, they can allow heat to travel across.

Source: <https://www.scientificamerican.com/article/space-heater-scientists-find-new-way-to-transfer-energy-through-a-vacuum/>

## STEM Career Spotlight

Aeronautical engineering is a fascinating career. Aeronautical engineers design aircrafts, spacecrafts, satellites, and even missiles. These



jobs have a median wage of \$115,220 per year or \$55.39 per hour. Aeronautical engineers have to use the engineering design process to create the equipment we see flying all around us.

Required Education: at least a bachelor’s degree.

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*“Imagination is more important than knowledge.” - Albert Einstein*

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## STEM in History



The idea of physics was created in 250 BCE by Archimedes, who was a Greek mathematician, physicist, engineer, inventor and astronomer. In 1911, Wilhelm Wein, a German physicist, was recognized for his discoveries regarding the Laws Governing the Radiation of Heat. In 1921, Albert Einstein received a Nobel Prize in physics for his discovery in the Law of Photoelectric Effect. These individuals, along with many others, helped greatly develop the subject of physics the way we know it today. Their discoveries have a significant impact on our everyday lives.

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## STEM Across the Curriculum

What better way to learn about physics than to get physically moving? In this P.E. activity, students can measure the amount of time it takes them to walk, jog, or sprint a particular distance and then calculate their speed and average speed. They can alter the variables to determine what affects the speed of their performance.

Source: <https://www.teachhub.com/integrate-science-across-curriculum>

## STEM Movies

*The Theory Of Everything (2014)* is the story of a famous theoretical physicist and cosmologist,



Stephen Hawking, and how he proposed the first theory of cosmology. The theory of cosmology is the study of the large scale of

properties that makes the universe whole, involving the theory basic physics and quantum physics. Stephen Hawking suggested that the universe is not infinite, but it has a certain size. Similar to the Earth, Hawking proposed that the universe has an end boundary, and those traveling amongst the universe would simply continue to orbit it.

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*"To every action there is always opposed an equal reaction."* - Sir Isaac Newton

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## #STEM@ADM Spotlight

Mr. Long teaches PLTW Flight and Space at Alice Drive Middle School. He incorporates science in his teaching by having students design model airplanes. Mr. Long uses physics in particular to explain concepts of aeronautics and how the planes are able to fly. Thank you, Mr. Long, for sharing your passion for STEM with your students!

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## Famous STEM Person

Marie Curie is a famous physicist who discovered the components of polonium and radium. She was also the first woman to be awarded two Nobel Peace prizes in 1903 and 1911.



## STEM Challenge

The Ring Wing Glider

Materials: 8.5 x 11, tape, and ruler/tape measure

1. Fold a piece of 8.5- x 11-inch paper diagonally.
2. Make a 1/2-inch fold along the previously folded edge.
3. Make a second 1/2-inch fold.
4. Curl the ends of the paper to make a ring and tuck one end into the fold of the other.
5. Gently grasp the "V" between the two "crown points" with your thumb and index finger.
6. Toss the glider lightly forward. Note: Curling the ends to make a ring changes the shape of the wing and improves the wing's flight performance.

Source: <https://www.jpl.nasa.gov/edu/teach/activity/ring-wing-glider/>

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## STEM Puzzle

Riddle: How can you throw a ball as hard as you can and have it come back to you without hitting anything? There is nothing attached to the ball and nobody else catches it.

Answer: Throw the ball straight up in the air