

Engineering for a Better Life



STEM DREAMS THE LAB AT NEW RINGGOLD

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[An Alternative Energy Solution - A System of Green Energy Components](#)

I was at a meeting of local farmers and environmental solution providers this past week. While the conversation was focused on creating forested riparian buffers designed to aid in purifying local streams, there were many environmentally conscious people present who had other questions on their mind. One of these was a middle aged woman who was concerned about what to do with the burn waste from her coal stove.

While we were waiting on the line for our farm fresh luncheon buffet provided as a reward for attending the meeting I got into a conversation with this lady. I mentioned that coal, while being a Pennsylvania product was also one of the dirtiest fossil fuels to burn and had many consequences for the environment. I suggested that she think of installing a pellet stove, which could burn several different fuel types, such as compressed wood pellets, made mainly from construction waste and saw dust, corn, cherry pits and even pellets made from switchgrass. Now all of these are renewable resources, all are taken from plants that when alive drew carbon dioxide from the air, and once burned released that carbon dioxide back into the atmosphere making those fuel sources carbon neutral.

Her response was interesting and made me think a little bit deeper. Her concern with any device which required electricity was that the production and especially storage of that energy be in itself a non polluting source. Now a pellet stove, while not using very much energy still requires electricity to run the computer, the auger and the blower. So I asked what she specifically had a problem with, after all I suggested that she could use solar power to create the electricity, a source once manufacturing was done that had no moving parts and whose material was designed to last between twenty– five and thirty years.

She responded by saying that she had difficulty with batteries, all of which are made from toxic materials and whose life span was considerably shorter than the solar panels that they served. She had some objections to wind power because of the dangers posed by the turbine blades to bird life, so what to do? Well I knew of one possible solution, I suggested that she investigate the use of thermocouples in creating energy. These devices, when heated, cause a differential between two metals allowing the production of electricity.

She said that she would look into it by investigating thermocouples on the internet. We parted, once the food was obtained that is, and went our separate ways. But the conversation got me to thinking about energy creation and storage for use in creating electricity in an individual's home or business

While a individual may have some difficulty getting their hands around the “systems” used to create and store energy for off grid use the resulting systems once in place, should operate as smoothly as any traditional energy source. The difference is that they are made up of and operate as green systems that effect the environment very little while still accomplishing the goal of providing energy for the home or for business.

In the next two issues of this newsletter I will address two other complete energy systems that fit this description, stay tuned for more or better call me for an appointment and let's talk!

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Engineering for a Better Life

A Classroom Report Preparing For Spring NASA MSRR Project

Okay, so the planes were tested using a variety of weights added to the front and two different throwing positions. The weights added some needed aerodynamics, cutting through the air envelope, but to be honest the wings were not shaped well enough to give the effect that I was looking for.

Leaving that behind as a finished project we had the kids describe the appearance and discuss the effect that the shape of a Frisbee would have on flight characteristics. Of course they needed to see the actual results so we had them pair up and fly the Frisbees, albeit carefully, in the cafeteria. The overall effect was as anticipated and in the course of having a great deal of fun we may have created one or two students which will carry on the tradition of Frisbee flying on a college quad somewhere in the future, lol!

Our last project of the day was the creation of straw rockets, always a favorite of mine as I explained Newton's Laws of Motion to the class.

If the ball keeps its shape or breaks only with difficulty into solid sections rather than loose soil, it still contains too much water. Clay soil that is too wet will feel slick when rubbed between thumb and forefinger.

If it is very wet (75 to 100 percent moisture), the mass will be pliable, and a ribbon of earth can be drawn out and pressed with your finger. Working soil that wet can spoil its texture for the whole season.

Heavy clay soil will form a ball even when moisture content is less than 50 percent. Soil that is somewhat coarser, a sandy loam or silt loam, tends to crumble when moisture content is low but will probably form a ball at about 50 percent. At 75 to 100 percent moisture, it will be dark, pliable, and may feel slick between the fingers.

Coarse-textured sandy soil will not form a ball if moisture content is below 50 percent. At 75 to 100 percent moisture, it can be pressed into a weak ball, but even then it shatters easily.

<http://www.organicgardening.com/learn-and-grow/preparing-soil-spring>

With just a little over 15 days until the deadline of coming up with the \$5,000 registration fee and the decline in class attendance caused by weather and home situations, I sadly decided to pull the plug on this year's competition.

I emailed my contact at Worcester Polytechnical Institute in Massachusetts and thanked her for allowing us the chance to do this great project.

While doing so I assured her that we will continue to work on our Bot and that we thoroughly intend to compete in June 2016. So stay tuned, I will continue this column as we move forward in the project.

If there is any interest at all in either being a part of this project or financially supporting the project please call us at 570-386-2392, thank you!



Butterflies in the Garden—The Monarch of All!

By growing a bounty of native flowering plants in your garden, you can attract a variety of the more than 220 butterfly species

A good pollinator garden contains food not just for adult butterflies, but for their caterpillars too. Female butterflies select specific plants on which to lay their eggs; this

ensures that when their eggs hatch, the caterpillars will be able to eat the plant's leaves while growing into adult butterflies. Two-tailed Tiger Swallowtails lay their eggs on ash and chokecherry leaves.

Of special interest is the now endangered Monarch Butterfly, whose young nest on the leaves of the Milkweed plant.



Photo Courtesy of: Deborah P. Goodale

My Life: The Story of a Photon—Second Installment

So what do I look like, another really good question and the answer is really hard to give you. You see I have that identity crisis thing going on and it even comes down to knowing what it is that I am myself. Scientists describe me this way: A photon describes the particle properties of an electromagnetic wave instead of the overall wave itself. In other words, we can picture an electromagnetic wave as being made up of individual particles called photons. Both representations are correct and reciprocal views of electromagnetic waves. For example, light exhibits wave properties under conditions of refraction or interference. Particle properties are exhibited under conditions of emission or absorption of light.

Whewww, I wonder if they have Psychiatrists for photons? So I can be described as both a particle and an energy wave, something in between, say a Quasi particle, yep I think that I like that name! To make it even more interesting I am very tiny in

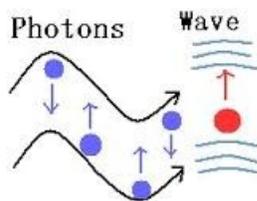
fact according to the boys in the white coats, (I mean lab coats) I am about as small as they come.

“A photon is the quantum of electromagnetic radiation. The term quantum is the smallest elemental unit of a quantity, or the smallest discrete amount of something. Thus, one quantum of electromagnetic energy is called a photon. The plural of quantum is quanta. The concept of photons and quanta comes from quantum mechanics and quantum theory. Quantum mechanics is a mathematical model that describes the behavior of particles on an atomic and subatomic scale. It demonstrates that matter and energy are quantized, or come in small discrete bundles, on the smallest scales imaginable. A photon propagates at the speed of light.”

Now that is saying a mouth full, thank you <http://study.com/academy/lesson/what-is-a-photon-definition-energy-wavelength.html>, as I am not certain where I would run across the next physicist I

borrowed my own definition from here. Although I am not really sure what it means to propagate at the speed of light, I guess I will just have to settle for that fast moving thing that I described earlier.

You know if I stopped and thought about it and stopping would be really hard for me to do as you know, I would have to guess that all that speed implies something else, I would need a lot of energy to move that fast. Here I will make it easy for you, wait for a nice spring day, you know not too hot not too cold, slip on a pair of running shorts and your best running shoes and try to run just as fast as you can for just as long as you can. I bet that when you stop you will be really, really tired. So you will know that it takes a ton of energy to move as fast as I do.



Lise Meitner (1878 – 1968)

When Lise Meitner finished school at age 14, she was barred from higher education, as were all girls in Austria. But, inspired by the discoveries of William Röntgen and Henri Becquerel, she was determined to study radioactivity. When she turned 21, women were finally allowed

into Austrian universities. Two years of tutoring preceded her enrollment at the University of Vienna; there she excelled in math and physics and earned her doctorate in 1906.

Meitner made her way to Ber-

lin. There she collaborated with Otto Hahn on the study of radioactive elements, but as an Austrian Jewish woman she was allowed to work only in the basement.

Meitner calculated the energy released in nuclear reactions

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and named the phenomenon “nuclear fission.”

<http://www.smithsonianmag.com/science-nature/ten-historic-female-scientists-you-should-know-84028788/?no-ist=&preview=&page=6>



YOUNG MINDS! REAL WORLD PROBLEMS! UNIQUE SOLUTIONS!

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We are a Christian Based Organization. We Believe!

For twenty two years I have operated my for profit company: KG Projections, Inc. and for the past ten years The Weatherly Institute for Robotics and Engineering or W.I.R.E. a PA recognized non-profit.

My for profit company has generated most of the monies needed for my non profit to survive and complete its mission to teach the children engineering.

Now I have introduced a third arm, STEM Dreams the Lab at New Ringgold. While not a separate company it is the umbrella structure to support my other two enterprises and will allow me to open up a research facility dedicated to creating new technologies to help in our struggle with a changing climate and alternative energy strategies.

I intend to share some of these concepts with you my readers beginning with the Robotic Bee program. So please look for further developments in the pages of this newsletter and those to follow.

Please consider the donation of a **stereoscopic microscope with camera mount or the money (\$300) to purchase the unit.**

Thanks: Stephen Goodale

It is the goal of The Weatherly Institute for Robotics and Engineering to create a culture of Science and Technology in which young people and adults may come to learn and be inspired!

Over the years we have watched as technology has increasingly driven our culture, while the number of people who are actually taking engineering and technology courses have decreased. Even more maddening is that this knowledge base has found its way overseas and to other countries making the United States vulnerable to the whims of a global economy.

W.I.R.E. has taken the challenge up in a small way, bringing young children, young adults and adults to the class room and exposing them to a wide range of engineering opportunities.

Changes at STEM Dreams the Lab at New Ringgold

I was privileged to hear a wonderful sermon today from my Pastor Leeland Stauff, Grace Bible Church at Hawk Mountain. He was working his way through 1 Corinthians chapter 14 and strove to make the point that for the church to survive it needed to draw in and keep more young people. To do this he felt that a church, any church would have to welcome visitors warmly and listen to what they had to say incorporating new ideas while being very sure not to yield on Biblical Principals and especially not to interpret the Word of God. As he says we are changed by the Word of God we don't change it.

Well anyway I was especially interested in the youth issue. You see at the STEM Dreams Lab we strive to capture young people's imaginations and to channel those imaginations into creative and constructive paths that will benefit all of humanity. We also introduce the three elements of life: the Mind, the Body and the Spirit. Take away any of those three things and you will fall.

It is difficult for some people to believe that science and religion, (I prefer to call it a belief in God and Jesus as our Savior), as impossible to bring together. We at STEM Dreams believe that both are necessary and indeed are required for man to live in this modern age. We also believe that they are inclusive and not derisive.

We do not harp on issues such as Creationism and Evolution, leaving that to our ministers but instead prefer to examine real world problems and work on solutions that affect a positive change in our world.

I invite all who wish to come and see what we are up to, to join in this worthwhile effort. We welcome those young minds who seek God and seek a challenge, let's do this together!

