

THE NEW WANDERINGS

No. 11

01 February 2012

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Feature:

In a 15 January 2012 posting, by Sheldon Graves, we see a simple demonstration of how mechanical energy can be used to produce electrical energy that he found on Arvind Gupta's popular "[Toys from Trash](#)" Web site.

In this *Feature* I will also be using Arvind's site. This time, to introduce you to some simple DIY [Spectroscopes](#) that could allow you to do some actual science

The following DIY spectroscopes will be using [diffraction gratings](#) that you can make from a CD or DVD disc.

Instructable: DIY Spectroscopy

This instruction gives you a template that you simply print, cut and glue to produce your instrument. After I accidentally crushed my 'scope, I decided to build a larger version out of corrugated cardboard. I also upgraded the slit by using two razor blades.

[CD - Spectroscope](#)

Arvind Gupta gives another view (which may be clearer) of the previous Instructable.

[YouTube: Make Your Own Spectroscope](#)

This spectroscope is constructed from an empty toilet paper roll and a CD.

[A Simple DIY Spectroscope](#)

This looks like it might be a good design but the one shown in the video is VERY crude!

[A Cereal Box Spectroscope](#)

NASA shows what you can do with an empty cereal box. This 'scope uses a transmission diffraction grating so you will have to remove the CD's backing as is demonstrated in the above YouTube clip.

[CD Spectroscope](#)

Build a spectroscope from a CD and a cardboard box. It's easy!

[Jim Sluka's Homemade Spectrometers](#)

Jim describes a couple of spectrometers that he made using CDs (or DVDs) and PVC pipe.

Caution! He also uses some math to describe the theory ☺

[A High Resolution Spectrograph](#)

After building your spectrograph, this site allows you to upload your spectra, via the Internet, to the site's analysis program which will, in turn, send you back a graph of your spectra.

[Joachim Köppen's Spectroscopes](#)

[Joachim](#) shows us a collection of experiments, explanations, and suggestions about using CDs or DVDs as spectroscopes.

[Diffraction Grating Math](#)

Along with their definition of [Diffraction Gratings](#), Hyperphysics has a "plug & play" applet that computes diffraction parameters.

[Using a Home Made Spectrometer to Measure the Wavelength of a Laser](#)

A simple spectrometer is used to measure the wavelength of a laser.

[YouTube: Homemade CCD Spectrometer](#)

This spectrometer was built by Adolf Cortel, a Spanish physicist and educator. This link does not contain instructions or plans but shows you what is possible for a skilled amateur

[Light and Its Uses](#)

This book, covering the making and using of lasers, interferometers and spectrosopes, is a collection of articles from *The Amateur Scientist*. Sadly, it is now out of print but you may still be able to get a used one from Amazon for under \$25. Also, don't forget the [Scientific American's "The Amateur Scientist". \[CD-ROM\]](#)

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Wanderings:

[The UCSC Genome Browser](#)

UCSC Genome Browser contains the reference sequence and working draft assemblies for a large collection of genomes.

[Homebuilt Seismometers](#)

Allan Coleman describes the design and construction of several of his homebuilt seismometers.

[Earthquake Hazards Program](#)

The USGS provides a service that monitors global seismic activity.

[How to Measure the Diameter of the Sun](#)

I found this link to Rick Boozer's Blog at the SAS Facebook site. Rick describes a simple method of "*Measuring the Sun's Diameter with a Cardboard Rug Tube*".

[How Would You Measure Your Hair Diameter?](#)

Find out how, along with many other interesting items, on Alan Yates' Web site.

[Richie's Tesla Coil Page](#)

Have a look at Richie Burnett's site if you are contemplating building a coil.

[Water Rockets](#)

Clifford Heath shares some of his water rocket experiences and provides a gate way to other related sites.

[Jim Sluka's Page](#)

Jim's page is dedicated to Spud Guns but many of his ideas can be used for other projects. He covers a lot of the theory and math relating to his creations. Your time will be well spent here!

[U.S. Army's Guide to Amateur Rocketry](#)

In 1963, the US Army created a booklet to help guide amateur rocket scientists in to help these individuals safely participate in rocketry in an era when there was a lot of experimenting but very few commercially available rocketry products

[Potassium Nitrate & Sugar Propellant Latest Target of ATF Scrutiny](#)

Potassium nitrate based rocket fuels are regarded as an explosive, by the ATF while, at the same time, a court ruling has determined that [ammonium perchlorate composite propellants](#) (APCP) are not! Go figure.

[Rocketry Planet](#)

The above two items were found on the *Rocketry Planet Web Site*. Drop by and have a look.

[Where Does She get the Time?](#)

Here is the list of some of [Tatjana Joëlle van Vark's](#) projects.

[Ben Krasnow's Blog](#)

You will also wonder where Ben gets all of his time. Perhaps he stays in the shop after hours to work on some of his various interests.

[Ben Krasnow Makes Aerogel](#)

Ben shows how he made [aerogel](#) in his shop.

[Tetramethylorthosilicate MSDS](#)

You should check out the MSDS Sheet for TMOS (tetraethylorthosilicate) if you wish to mix up your own batch of aerogel,

[Open Source Aerogel](#)

Here you will find an encyclopedic reference about aerogels and how to make them.

[PhET Simulations](#)

PhET provides free fun, interactive, research-based simulations of physical phenomena.

[Build Your Own Virtual Kaleidoscope](#)

This simulation enables you to construct a fairly complex kaleidoscope.

[Visual Analyser](#)

Visual Analyser is a free real time software package that will transform your PC's sound card into a dual channel storage oscilloscope, a spectrum analyser and a function generator.

[YouTube: Quick look at Visual Analyzer](#)

This is an example of how Visual Analyser can be used.

[Audacity](#)

Audacity is a free open source program that is used for recording and editing sounds on your PC.

[YouTube: Understanding Beats Using Audacity](#)

Use Audacity to produce a beat between two tones.

[POV-Ray](#)

The Persistence of Vision Raytracer (POV-Ray) is a free high-quality tool for creating [stunning three-dimensional graphics](#).

[Laser Pointer Forums](#)

The members of this forum discuss all aspects of laser pointers.

[High Power Laser Diodes](#)

In this site you will find helpful reviews, data, purchasing information and much more items of interest concerning high power laser diodes.

[The Open Source Fusor Consortium](#)

Following in the shadow of [Philo Taylor Farnsworth](#), a group of amateurs are experimenting with nuclear fusion and building their own Farnsworth Fusors.

[Chad Ramey: Fusion for the Future!](#)

Follow the adventures of Chad Ramey, a young "fusorner".

[the Bell Jar](#)

Many areas of experimentation such as fusors, lasers, and electron microscopes, just to name three, require the use of a vacuum. Steve Hansen's *the Bell Jar* is the source for vacuum technology.

[The Return of Amateur Science](#)

Mark Frauenfelder explains how the natural tinkerers who built the web are starting to hack the world.

[HyperPhysics](#)

HyperPhysics is an exploration environment for concepts in physics which employs concept maps and other linking strategies to facilitate smooth navigation.

[Japanese Tsunami Debris Field](#)

University of Hawaii scientists, Nikolai Maximenko and Jan Hafner, have mapped out the predicted sea route of the debris from the 11 March 2011 Japanese tsunami.

[The International Pacific Research Center](#)

IPRC is an international climate research center that focuses on the Asia-Pacific region. They seek to understand the climate system and how it may respond to human activity by conducting experiments with computer simulation models and by analyzing the many direct and remote observations related to climate.

[The Tohoku Tsunami is Linked to the Calving of Icebergs](#)

Kelly Brunt, a NASA scientist, and her colleagues were able to observe, for the first time, the power of an earthquake and tsunami to break off large icebergs from the Sulzberger Ice Shelf in Antarctica, a hemisphere away.

[Hobby Space](#)

Hobby Space is an unbelievable extensive resource covering all aspects of space exploration. This site will be useful for anyone who may be interested in space and space exploration.

[Amateur Planet Hunters Find Exoplanets](#)

If you would like to join in the search and try your hand at searching for exoplanets log into [Planet Hunters](#) and see what they have to offer.

Note: You may have to upgrade your browser in order to use *Planet Hunters*.

[Near Earth Objects Animation](#)

This animation, by Scott Manley at the Armagh Observatory, UK, shows the motions of all the asteroids in the Inner Solar System as known in 2007.

[Ancient Observatories & Sites](#)

The [Solar Center](#) at Stanford University gives us a look at some of the ancient astronomical observatories.

[TerraServer](#)

This North Carolina company offers satellite and aerial pictures of much of the earth. Their online search tool allows users to find and pre-view images before the possible purchase.

[Don't Be a PV Efficiency Snob](#)

Tom Murphy shows that the typical solar photovoltaic power efficiency of around 15% it's plenty good for our needs.

[PSmicrographs](#)

PSmicrographs is a specialist science photo library containing high quality scanning electron micrographs (SEMs) and photo micrographs.

[Popular Science Archives](#)

Google Books has archived all the issues of *Popular Science*, from May 1872 to March 2009.

If you find any item, in the archive that may be of interest please let us know so that we can include it in a future Wanderings.

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From Instructables, YouTube & Make:

[YouTube: DIY Point Contact Transistor](#)

[Jeri Ellsworth](#) shows us how to cook up a piont contact transistor at home.

[YouTube: Can a Wind Powered Vehicle Travel Downwind Faster than the Wind?](#)

Some experiments relating to wind powered vehicles are shown in this video.

[YouTube: Down Wind faster than the Wind](#)

This is the link to Jack Goodman's article in the Catalyst – Journal for Amateur Yacht Research Society.

[Youtube: Along the Paper Faster than the Paper](#)

Coolaun has 4 YouTube demonstrations of relative motion as can be related to wind powered vehicles.

- [Under the Ruler Faster than the Ruler](#)
- [Under the Ruler 2: The Ground Moves](#)
- [Under the Ruler 3: Tilting the Ruler](#)

[YouTube: Electrostatic Accelerator](#)

If you have a high voltage source you should be able to build this simple electrostatic accelerator.

[YouTube: Bottle Cutting](#)

Dan Rojas, of [Green Power Science](#), shows us a method to cut glass bottles that will allow you to re-purpose them by removing their tops and/or bottoms.

[YouTube: Mold Acrylic a Parabolic Mirror](#)

In this video, Dan, demonstrates a simple way to mold an acrylic parabolic mirror in your own kitchen. He also shows how to cut a perfect circle with a table saw.

[Instructable: The Confuzzle](#)

Make this easily constructed puzzle and amaze your friends.

[Instructable: How to Make ECG Pads & Conductive Gel](#)

Regular readers to *Wanderings* will know that I am always interested in “low tech” solutions to problems in the developing world. This Instructable is a good example of this. It shows how a simple DIY device can be used in a medical facility to perhaps save lives.

[Instructable: Determine the Acceleration due to Gravity](#)

The author uses a DIY photo gate and a PC recording program ([Audacity](#)) to determine the acceleration of gravity.

[Instructable: An External Interface for a PC Sound-Card ‘Scope](#)

This Instructable shows how to improve the operation of a sound card based ‘scope.

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The Kids Room:

[Dr Fizzix Mousetrap Car Help Center](#)

Dr. Fizzix has suggestions and tips for constructing mouse trap powered vehicles plus he offers a selection of parts and complete kits.

[Drink Pee!](#)

This Urine to Fertilizer DIY Kit enables you to derive houseplant fertilizer and ocean-safe water from your pee!

[Build a Rocket](#)

Join NASA and build your own virtual rocket.

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Random Samples:

[Mad Housers](#)

Mad Housers Inc. is an Atlanta-based non-profit corporation engaged in charitable work, research and education whose main goal is to provide shelter for homeless individuals and families regardless of race, creed, national origin, gender, or age.

[A Slippery Business](#)

A 2007 article in The New Yorker reports that the trafficking of adulterated olive oil is comparable to cocaine trafficking, but with none of the risks.

[Wolf!](#)

I got a kick out of this ☺

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Suppliers and Stuff:

[Scientific American's "The Amateur Scientist" \[CD-ROM\]](#)

This CD contains the complete The Amateur Scientist columns from Ingalls to Carlson.

You have just finished building your project's instrumentation but it looks rather dull. You could dress up the aluminum components by Frank J. Hoose's information on [Anodizing Aluminum](#) that we saw back in *Wanderings #8*, but what about the dials and panel markings? You could use the low tech method and use a [Dynamo Tape](#) or a [P-Touch](#) label maker or you could use your word processor and/or graphics program to produce a [Decal](#) which would give professional looking results.

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From The Far Side:

Ridiculed Discoverers, Vindicated Mavericks

Bill Beaty says that even though the majority of “fringe science” claims are bogus, we cannot dismiss every one of them without investigation.

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