

**THE NEW WANDERERINGS
ARCHIVE**

No. 10 to No. 21

January to December 2011

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THE NEW WANDERINGS

No. 10

January 2012

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<http://citizenscientistsleague.com/>

Feature:

Recently, I was looking around the Web for some resources to assist in introducing some young children to robots and computer programming.

I remembered that back in the late 70's, there was something called [Turtle Graphics](#), a feature of a computer language called [LOGO](#). I thought that this would fit my needs perfectly.

Turtle Graphics allows the user to move a sprite around the computer screen with a series of simple commands. The following links are a few examples of the many fine examples of Turtle Graphics that can be found on the Web.

Turtle Home Page

Turtle, a graphics programming environment designed to provide an enjoyable introduction to programming.

Turtle Graphics Applet

This example of Turtle Graphics was implemented in Java.

[An Introduction to Computer Programming](#)

At this time, I think that this is a little deeper than I need. But still, it is an excellent resource. "This website is for parents and teachers, and some students. It is a walk-through of the basic concepts behind writing computer programs, with an emphasis on graphics and games. The goal is for students to have fun, while learning the importance and practical aspects of mathematics, processes, problem solving, and critical thinking."

[Web Turtle](#)

Web Turtle can be used to help teach simple computer programming as well as the basics of geometry! It's completely web-based so it should work on almost any type of computer that has a web browser!

Of all of the versions that I found, *Scratch* is my favourite.

[Scratch](#)

Scratch is a, free down loadable, programming language that makes it easy for young people to create their own interactive stories, animations, games, music, and art.

The *Scratch* programming environment consists of LEGO like building blocks that the user can Click/Drag/Drop into the editor, thus building a program.

Scratch will evolve as the user gains more experience. They can start out by simply programming a character to move around the screen and then perhaps move on to designing a game such as [Space Invaders](#) or [Pong](#).

There are even some sites that show how to interface *Scratch* to an *Arduino*, but more on that in a later column.

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Wanderings:

[Scientific Glassblowing: A Black Art](#)

Years ago, in one of my earlier "hand-me-down" chemistry sets there was a supply of glass tubing. I think that it was soda-lime glass. I enjoyed trying to duplicate the various exercises that were presented in the set's instruction manual. But I never did learn the "Black Art".

[The Scientific Glassblowing Learning Center](#)

Here is an extensive on-line resource to scientific glass blowing.

[Teralab Glass Blowing for Vacuum Devices](#)

This page, on the [Teralab's Web site](#), describes methods for working glass for scientific vacuum devices such as glow tubes, filament lamps and thermionic devices.

[Canon Hacking Development Kit \(CHDK\)](#)

Did any of you get a Canon camera for Christmas? If so, perhaps this free utility may be of interest to you. It will allow you to **temporally** override most of the camera's factory settings plus add some exciting new features such as remote shutter release and automatic time laps photography to name but 2. Check their *List Supported Cameras* to see if CHDK will work with yours.

Interested? Further info may be found at:

- [One Page Ultra-Quick Users Guide](#)
- [CHDK Firmware Usage](#)
- [CHDK/End Users Guide All Best 50](#)
- [CHDK-SVN Autobuild Download](#)
- [How to Expand Your Camera With CHDK](#)
- [USB Remote Cable](#)
- [Laser Triggered High-Speed Photography](#)

[Oldham Optical UK](#)

Oldham Optical's main product line is the manufacture of optical elements for the professional and amateur astronomical market. Their Web site contains much useful information for the experimenter.

[Interferometers and the "Conventional Testing" of Telescope Mirrors](#)

Are Interferometers better than a conventional *Null Test* for high accuracy in testing astronomical optics?

[Build a Red Light Source for Optical Testing](#)

A small light source capable of testing down below PV $1/10\lambda$ wave front accuracy can be made extremely cheaply from a standard red LED laser pointer

[Time Twister: A LEGO Based Digital Clock](#)

"*The Time Twister* consists of two LEGO Mindstorms bricks communicating via Bluetooth. The master brick keeps track of the time and handles the minute digits. The slave brick handles the hour digits and the second indicator."

[Some Other Hans Andersson “Twister” Robots](#)

Can you believe the Sudoku Puzzle solving robot!

[The da Vinci Robot](#)

Here is one of [Daniele Benedettelli’s](#) robots drawing the Mona Lisa.

[Fully Differential Capacitive Sensors for Seismometers](#)

I came across these sensors a number of years ago and they seem like an interesting thing to experiment with.

[Yahoo Groups: The Mad Scientist](#)

This is an open Yahoo Forum that covers anything that pertains to amateur science.

[Yahoo Groups: Amateur Science](#)

You must become a member in order to view the posting on this forum.

[Science Forums](#)

“Science Forums welcomes science discussion at all levels — from beginners to researchers, covering topics from biology to computer science, and much more.”

[Modern Microscopy](#)

Modern Microscopy is an on-line magazine covering the technical aspects of microscopy, procedures and methods.

[How to Boost Your Microscope’s Power to Examine Your Own Samples](#)

“Magnifications of approximately 8000x and the detection of biological components to approximately 0.2-0.3 microns have been achieved with the general methods described on this page.”

[Fun With a Webcam](#)

Here is a collection of interesting things that you can do with a webcam.

[Build a Single Phase Submicro Brushless Motor](#)

If your eyesight is good enough you might wish to give this a try.

[Thomas Edison's Phonograph](#)

For something a little different, why not try building a replica of Edison’s phonograph from scratch?

[Bizarre Labs](#)

Search the [Index Page](#) for interesting projects that you can do in your kitchen.

[A 4-Bit Counter Using Relays](#)

Now, this is "old school"! I built something like this way back in the early '60's.

[Amateur Scientist's Guide to Water Quality Monitoring Observations](#)

Water quality is based on many factors. They can influence the water in different ways, and the effect of each factor might be different in different locations. This NASA site will help you to get started in monitoring the water in your area.

[Pachube](#)

Pachube ("patch-bay") is a web-based service that gives people the power to share, collaborate, and make use of information and data generated from the world around them.

[Motion: A Software Motion Detector](#)

Motion is a program that monitors the video signal from cameras and is able to detect if a significant part of the picture has changed.

[The Basement Mechanic's Guide to Building Perpetual Motion Machines](#)

This guide, along with other very interesting topics, may be found on **[Donald Simanek's Web Site](#)**.

[Eric Weisstein's World of Science](#)

This site contains budding encyclopedias of astronomy, scientific biography, chemistry, and physics.

[AirDrop Irrigation System](#)

The winner of this year's James Dyson Award, was Edward Linnacre, an Australian university student, who invented *the AirDrop Irrigation System* which condenses water vapor from the surrounding air and turns it into water

[Stem Cells](#)

Research into stem cells grew out of findings by **[Ernest A. McCulloch](#)** and **[James E. Till](#)** at the University of Toronto in the 1960s.

[Ted Talks: Michael Nielsen Speaks on Open Science](#)

What if every scientist could share their data as easily as they tweet about their lunch?

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From Instructables, YouTube & Make:

[YouTube: Let Your Kids Break Stuff!](#)

Stephen Colbert interviews Neil de Grasse Tyson about kids and science.

[YouTube: LEGO GBC 20 Modules](#)

Somebody had a LOT of free time and a good collection of LEGO pieces.

[Instructables: A Simple IR Detector](#)

See how a night-light can be used to detect infrared light.

[Instructables: Build a High Voltage Motor](#)

These instructions will show you how to build a to build twin rotary ion motor demonstrating the Biefeld-Brown effect.

[Instructables: A DIY Front Surface Mirror](#)

Here we see how to make a front surface mirror from a piece of acrylic mirror.

[Make: Build a Teacup Stirling Engine](#)

This project may be a bit ambitious for the average experimenter. But, if followed successfully, you will end up with an engine capable of running off of the heat from a teacup.

[Make: Temperature Logger](#)

See how to modify a 3M TL20 temperature log for amateur use.

[Make: USB Webcam Microscope](#)

Here's a relatively easy way to graft a USB webcam onto a RadioShack pocket illuminated microscope.

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The Kids Room:

[The Little Scientists](#)

Here are some tips for teaching children math and science through hands-on experience.

[The Google Science Fair](#)

The Google Science Fair is the largest global online science competition that celebrates the curiosity and investigations of young scientists everywhere!

[Is your Dog a K9 Genius?](#)

Are you looking for a Science Fair project? Then perhaps this IQ Test for a dog might be of interest. It was developed by Dr. Stanley Coren, professor of psychology at the University of British Columbia and a prize-winning dog trainer and an authority on canine intelligence.

[Science Teacher Resources](#)

This selection from [CR Scientific](#) contains simple experiments in chemistry, mineralogy, biochemistry, and microbiology.

[T-Rex to Go](#)

This book will show you how to build your own dinosaur from chicken bones.

[Animal Tracks](#)

This page explains how you can cast and collect animal foot tracks.

[Science Playwiths](#)

The Science Playwiths site offers activities that will take young people away from the keyboard and monitor and allow them to get their hands dirty.

[Grammar and Usage for the Non-Expert](#)

These articles by Tina Blue are intended to solve common problems of grammar and usage for those people who want answers but who do not want a lot of technical explanations.

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[Women in Science:](#)

[Sharon Terry: Citizen Scientists](#)

“Ordinary people are taking control of their health data, making their DNA public and running their own experiments. Their big question: Why should science be limited to professionals?”

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Random Samples:

[Calendars That Work](#)

This site allows you to build and print a free calendar for the current and next month.

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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.

[Custom Printed Maps](#)

I love [topographic maps](#) and *MyTopo* allows me to customize a map of an area of interest. They will than mail my map to me.

[Arduino Data Logging Shield](#)

I just purchased one of these shields but I have not had time to try it out. The logger can save your data to a 2 gig SD card and has a real time clock to allow you to time stamp your data.

[The Solarbotics SAFE](#)

The *Solarbotics Arduino Freeduino Enclosure* (SAFE) is a laser-cut acrylic case for your Arduino based project.

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On The Lighter Side:

[Geek T-Shirts](#)

If you need a new T-Shirt have a look at these humorous science related shirts.

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From The Far Side:

I was originally going to make a *Feature* out of these links. But since they propose a controversial theory, I thought that it would be better placed in this section.

On 09 Nov. 2004, I caught part of a very interesting PBS feature --- [America's Stone Age Explores](#). The program looked at the common theory that the first North American peoples crossed the Bering Land Bridge from Asia about 13,500 years ago.

But, there are some that contend that there could have, also, been a migration, west, from Europe.

Years ago, while sailing into the Arctic, through [Davis Strait](#), I remember that for as far as the eye could see, the sea ice was black with seals and there was almost a daily sighting of various types of whales. Their presence represented a huge food supply and if the modern [Inuit](#) can live, for extended periods, on the sea ice by hunting seals, other marine animals and fish, why couldn't ancient man? I thought that perhaps a band(s) of peoples could have followed the ice edge, west to North America, either by foot, dog team or boat (similar to [Inuit umiak](#)

Years later, I learned of the theory that the [Solutreans](#), a [Clovis](#) like people of ancient France and Spain, may have crossed to North America from Europe.

[Mitochondrial DNA](#) analysis of [North American First Nations Peoples](#) showed the expected Asian markers. But then the investigators were thrown a curve ball when they found evidence of pre-Columbian European influences, along with the Asian markers, in the DNA of the [Ojibwa People](#). This new DNA turned out to be similar to that of the Clovis like [Solutrean People](#) of ancient France and Spain.

The North Atlantic Ice-Edge Corridor

Possible Palaeolithic Route to the New World ---- Bruce Bradley and Dennis Stanford contend that that the earliest origin of people in North America may have been from southwestern Europe during the last glacial maximum.

The Stone Age Columbus?

This BBC documentary asks --- "Who were the first people in North America? From where did they come? How did they arrive?"

[Early Dates, Real Tools?](#)

The Topper Site, South Carolina: Archaeologist, Albert Goodyear, claims that humans were in North America 50,000 years ago?

[Immigrants From the Other Side](#)

Clovis Is Solutrean?

[Center for the Study of the First Americans](#)

The Center for the Study of the First Americans explores the questions surrounding the peopling of the Americas.

[The Clovis First / Pre-Clovis Problem](#)

“Tony Baker proposes that the “first peoples” entered North America, via the Bering Strait, about 20-30,000 BP, and gradually populated North and South American. Than sometime between 17,500 and 11,500 BP a few individuals from Europe found their way into the New World. They did not bring a gene pool, but they brought the Solutrean lithic technology from which the indigenous population adopted the soft hammer percussion technique and the exquisitely made biface. The Clovis point was then invented almost overnight and it spread across the in place population in a very short time.”

[A Journey to a New Land](#)

The *Virtual Museum* at Simon Fraser University Museum of Archaeology and Ethnology looks at the Siberian migration.

[Solutreans: The first Americans](#)

I, originally, saw this program on TV, a few years ago, and recently found it on YouTube by accident.

- [Part 2/9](#)
- [Part 3/9](#)
- [Part 4/9](#)
- [Part 5/9](#)
- [Part 6/9](#)
- [Part 7/9](#)
- [Part 8/9](#)
- [Part 9/9](#)

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THE NEW WANDERINGS

No. 11

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 an Acrylic 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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THE NEW WANDERINGS

No. 12

March 2012

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<http://citizenscientistsleague.com/>

Please take a few minutes and send me an e-mail and let me know:

- Where you are located
- What you are your interests
- What you would like to see in *Wanderings*
- What you like about *Wanderings*
- What you do not like about *Wanderings*

One thing --- Please put "TNW" in the Subject Line so that my spam filter won't bump you.

Thanks

Ralph

Feature:

The Promises, Demands, and Risks of Garage Biology

Eric Sawyer looks at the rewards and dangers of “garage biology”.

Garage Biology

“Amateur scientists who experiment at home should be welcomed by the professionals.”

DIY Biotech Hacker Space Opens in NYC

A New York group recently opened [Genspace](#), the world's first government-compliant community biotech laboratory.

DNA Extraction and the Strawberry Smoothie

Genspace shows us a super easy way to extract DNA from strawberries.

Open PCR

The Open PCR project is offering a 16 sample thermocycler in kit form. With this device the researcher can produce millions of copies of a DNA sequence in a few hours.

Russell Durrett's Light Bulb PCR Machine

This Arduino controlled Light Bulb PCR machine uses a light bulb and an old computer fan as its heating and cooling elements.

CheapStat: A DIY Potentiostat

The CheapStat is an inexpensive DIY potentiostat, suitable for both analytical and educational applications that can be built for under \$80. This device supports cyclic, square wave, linear sweep and stripping voltammetry over the potential range -990 to +990 mV and over frequencies from 1 to 1000 Hz.

Cheapass Science – How to Build a \$21 Gel Box

Joseph Elsbernd shows us how to do gel electrophoresis with a DIY gel box.

The \$2 DIY Centrifuge

George M. Whitesides and his colleagues, at Harvard University, designed a centrifuge by modifying a manual egg beater.

The Quest for the \$500 Home Molecular Biology Laboratory

John Brunstein set out to see if it was possible to set up a complete molecular biology laboratory for \$500.

[A DIY Stir Plate](#)

A muffin fan and a couple of magnets are about all you'll need to construct this stir plate.

[Indie Biotech](#)

"Tutorials, Kits, Equipment and community for the DIY biologists and small Biotech start ups."

[DIY Bedbug Detector](#)

Dry ice is used as the heart of this bug trap.

[Black Light Flashlight Hack!](#)

Kip Kay shows us how to modify a LED flashlight so that it can be used to locate "Nasty Stains". ☹

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Wanderings:

[Sixty Symbols](#)

In my opinion, this site from the University of Nottingham, featuring videos about physics and astronomy, is probably one of the best science resources on the Web.

[More Symbols](#)

These other symbols were moved off of their Home Page.

[Test Tube](#)

Videos from behind the scenes in the *World of Science*

[Citizen Science Goes Extreme](#)

In the 17 February 2012 issue of Nature.com, a weekly on-line science journal, Katherine Rowland reports that "Researchers push for wider use of community-generated data in science and policy-making."

[The Public Laboratory](#)

"*The Public Laboratory for Open Technology and Science (PLOTS)* is a community which develops and applies open-source tools to environmental exploration and investigation."

[Video Spectrometer](#)

I am very disappointed that I did not find this site earlier, as it would have been a good addition to the Feb '12's Feature on spectrometers.

[Introduction to Spectral Workbench](#)

The Spectral Workbench is the free software package that accompanies the Video Spectrometer.

[Wine Tasting Spectroscopy](#)

Adam Hasler is experimenting with the possibility of using the PLOTS Video Spectrometer to analyze wine.

Note: *The Public Laboratory* is an open source program and therefore they invite you to join and take part in their projects or to submit your own.

[Northern Colorado Earth Magnetism Observatory](#)

Joseph A. Diverdi describes his observatory that is based around Roger Baker's design of a torsion balance magnetometer.

[The Tekatch-Welch Magnetometer](#)

Here is a magnetometer design that is based on the FGM-3h flux gate sensor.

[Göte Flodqvist's Compass Magnetometer](#)

By adding a ADC, to this simple DIY magnetometer, your computer will be able to record the magnetic variations.

[Crayon Physics](#)

I do not generally play video/computer games. In fact I find that they can't keep my interest for very long. But not so with *Crayon Physics!* This "is a 2D physics puzzle / sandbox game, in which you get to experience what it would be like if your drawings would be magically transformed into real physical objects. Solve puzzles with your artistic vision and creative use of physics." There is a free trial version, but with its \$19.95 price it's well worth it.

[The Virtual Astronomical Observatory](#)

Matthew T. Dearing posted this link for us on the CSL Facebook page. "The Virtual Observatory (VO) embodies the concept of large scale electronic integration of astronomy data, tools, and services on a global scale in a manner that provides easy access by individuals around the world."

[Printed Circuit Boards with Fritzing](#)

What a superb tool! Fritzing is an open-source initiative that enables designers, researchers and hobbyists to develop their own electronic circuits. Fritzing allows you to switch among bread board, schematic and PCB views.

[Create Your Own PCB](#)

For those of us who don't want to invest too much into PCB design tools, this may be right up your alley.

[Making PCB's With Windows Paint](#)

Here is a more detailed version of the method.

[Electronics-DIY](#)

Electronics-DIY looks like a great source of schematics, tutorials and downloads. In addition they have a wide selection of cost effective electronic kits. I might even consider purchasing a few.

[Stepper Motors](#)

This is a tutorial on stepper motors from the University of Iowa

[A Novel AM radio](#)

A 555 timer chip is the only active component in this novel AM radio receiver.

[Falstad's Math and Physics Applets](#)

I've listed [Paul Falstad's](#) site in the past. This time I'd like to show you his on-line java-based [circuit simulator](#).

[Processing](#)

Processing is an open source programming language and environment that can be used the Arduino.

[Molecular Expressions](#)

"Welcome to the *Molecular Expressions* Website featuring our acclaimed photo galleries that explore the fascinating world of optical microscopy."

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

I originally posted this link in the Feb '12 column but I just found out that the URL has been changed. In this link, Rick describes a simple method of "*Measuring the Sun's Diameter with a Cardboard Rug Tube*".

This is an EXCELLENT example of how things on the Web are not always permanent. If you come across something that really interest you --- SAVE IT or PRINT IT OUT! --- because it may not be there when you go back to it.

[How to Make a Three-Pendulum Rotary Harmonograph](#)

"A harmonograph is a mechanical device that uses swinging pendulums to draw pictures, believed to be originally invented in 1844 by Scottish mathematician Hugh Blackburn." This design uses a simple bearing & gamble system.

[Dynamic Periodic Table](#)

Ptable's *Dynamic Periodic Table* is probably one of the best on the Web! Be sure to look at their "About" and "Demo"

[Uranium Chemistry](#)

In his Blog, Carl Willis brings Uranium Chemistry to the amateur scientist.

[Carl's Farnsworth Fusor](#)

Carl Willis' Blog, also, includes an account of his work with his DIY [Farnsworth Fusor](#)

[The Gyrocompass](#)

This article shows how a spinning rotor can be made north seeking.

[Dirac Delta Science and Engineering Encyclopaedia](#)

What is a **Quintic**? Find the answer of this and other useless and useful information in the Dirac Encyclopaedia.

[Robert A. Paselk Scientific Instrument Museum](#)

This museum at the Humboldt State University contains a large collection of antique scientific instruments.

[The Museum of the History of Science, Oxford, UK](#)

Several years ago I was fortunate to be able to visit this museum which "houses an unrivalled collection of early scientific instruments in the world's oldest surviving purpose-built museum building."

[The Cyberneticzoo](#)

Come and visit Reuben Hoggett's site depicting the history of cybernetic animals and early robots.

[List of Impact Craters on Earth](#)

This is a list of the largest Earth Impact Craters (20 km or more) as listed in the [Earth Impact Database](#).

[Lab Tube TV](#)

The YouTube for scientists

[On Being a Scientist: Responsible Conduct in Research](#)

I found this link in a post by Forrest Mims to the CSL Face Book Page.

[On Being a Mentor to Students in Science and Engineering](#)

This e-book can be found on the same site.

[Sugars and Bacterial Growth Kill Off Coral Reefs](#)

“Bacterial growth, stimulated by the presence of simple sugars in untreated sewage and agricultural runoff, can now be added to the list of things contributing to the demise of coral reefs.”

[White-Nose Syndrome](#)

White Nose Syndrome is a devastating fungal disease that is killing North American bats.

[Symmetry](#)

“*Symmetry* is a magazine about particle physics and its connections to other aspects of life and science ...”

[The Feynman Lectures on Physics](#)

Michael A. Gottlieb set up this site in order to share information about *The Feynman Lectures on Physics*. Of special interest may be the math and physics exercises (with answers ☺).

[Einstein's 23 Biggest Mistakes](#)

“The man with the big ideas wasn't so good with the details. Hans Ohanian writes that Albert often let his intuition overrule flawed proofs and shaky math.”

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From Instructables, YouTube & Make:

[YouTube: DIY BIO Plastic](#)

Brandon Smith shows how to make BIO Plastic.

[YouTube: DIY Paddlewheel Wind Cart](#)

This is a very short clip but it gives you a pretty good idea on how to duplicate the car.

[YouTube: Make An Amazing Magic Ball!](#)

Most people will probably accuse you of having magnets hidden somewhere in the setup.

[YouTube: A Feynman Sprinkler Demonstration](#)

Is this video real or a hoax?

[YouTube: The Vacuum Cannon](#)

Professor Philip Moriarty, at *Sixty Symbols*, plays with a vacuum Cannon.

[YouTube: Who Was Louis de Broglie](#)

[Louis de Broglie](#) was a French physicist who managed to win a Nobel Prize with his PhD thesis.

[YouTube: Steam Engine Made From Junk](#)

This air operated engine, is a great improvement over the *Toilet Paper Tube Engine* that has been a well tried and tested design.

[Instructable: Toilet Paper Tube Engine](#)

The author uses this simple model engine as an activity for his shop students.

[Instructable: How to Smell Pollutants](#)

This Arduino based pollution detector is able to “smell” various gases just by changing the [Figaro gas sensor](#).

[Instructable: Air Quality Balloons](#)

A group of Carnegie Mellon students installed a PICAXE micro controller, [Figaro gas sensor](#) and a tri-colour LED in helium balloons.

[Instructable: An Arduino Controlled Toy Car](#)

A toy car is modified so that it may be controlled by a micro controller.

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The Kids Room:

[Home Testing for Endocrine Disruptors](#)

[The Public Laboratory](#) presents an interesting project that could provide the ground work for your next year’s science fair entry.

[The Vector Snowflake Generator](#)

[The Evil Mad Scientist](#) has a free application that enables you to draw your own snowflakes and save them in PDF format.

[Science Experiment Booklet](#)

This printable booklet will allow your child to record the steps and results for any science experiment that they are working on.

[Science Notebooking](#)

Here are some other science note boor resources.

[Darwinbots](#)

Darwinbots is an open source simulator which attempts to simulate artificial life and evolution.

[The Science Project Lab](#)

This is a selection of science projects, ideas, procedures and techniques for Grades 1 to 8.

[Google International Science Fair](#)

Google has launched their second annual *Google International Science Fair* which encourages students between the ages of 13 to 18 to be curious, ask questions, and perform science experiments to answer those questions.

[The Canada Wide Virtual Science Fair](#)

The Canada Wide Virtual Science Fair is an annual online science and technology contest open to all Canadian students in grades K-12.

[Lego Man in Space](#)

Two teens launch a LEGO man into near space.

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Random Samples:

!!! Happy St. Patrick's Day !!!

[Famine Soup](#)

I saw this receipt at the Strokestown Famine Museum in County Cork, Ireland. It looks like it had about as much nutritional value as flavoured water.

[Bacon and Cabbage](#)

On St. Patrick's Day many people eat a traditional Irish dish --- Corn Beef and Cabbage. The only thing is, the Irish did NOT eat beef, that is until they immigrated to North America and had a supply of beef, from the west. "Back home" they ate Bacon and Cabbage! --- Yum!!! ☺

[The Time Line of Ireland](#)

[Time Lines of History](#) maps out the history of Ireland through the ages.

[An Educational Road Trip With Richard Feynman](#)

This is one of the stories that can be found on the [Web of Stories](#) Web site.

[The Online Gallery](#)

The British Library has a wide variety of virtual books available on line. The collection includes extracts from Capt. R.F. Scott's Diary, the draft score of Handel's *Messiah*, 29 sketches by Leonardo da Vinci, highlights of Audubon's *The Birds of America* and an Ethiopian bible that was commissioned by Emperor Iyasu around 1700.

[Inkscape](#)

Inkscape is a free open source vector graphics editor, with capabilities similar to Illustrator or CorelDraw.

[The Open Clipart Library](#)

This is largest collection of public domain clipart that may be used in any project for free and with no restrictions.

[Clipart ETC](#)

This is an on-line collection of free clipart provided to students and teachers by the Educational Technology Clearinghouse at the University of South Florida.

[The Photography of Yann Arthus Bertrand](#)

Take some time out and enjoy viewing the collection of over 2000 spectacular photographs by the talented photographer, Yann Arthus Bertrand.

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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.

[ModKit](#)

Modkit is a browser based "Drag & Drop" programming environment for the [Arduino](#) that allows you to program by using simple graphical blocks and/or traditional text code. Modkit's graphical blocks are heavily inspired by MIT's [Scratch](#) programming system.

[Harris Educational](#)

Harris Educational's goal is to inspire people of all ages to discover science, technology, engineering, and mathematics through their various resources including their best selling science kits.

Framsticks

Framsticks is a three-dimensional artificial life simulation project that allows body structures and the brain functions of the creatures to be modeled.

8-Pin Programming Shield

You can program ATtiny series chips using your Arduino and then incorporate them into any project that you want.

Educational Innovations, Inc.

This company has a wide selection of products, information and ideas that should prove useful to the amateur experimenter or teacher.

DIY Gold Mining

There is a river, about 2 km from my camp, that has had reports of gold being found. Hmm --- I wonder if I could find some. With gold prices exceeding \$1500US/oz it might be worth my looking around a bit. ☺
Mygoldpanning.com has plans for a selection of DIY gold recovery devices plus some information on where and how to find gold.

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On The Lighter Side:

The Dangers of Dihydrogen Monoxide

We've seen this before. But it's always a source of a good chuckle.

Lists Galore!

You name it and it's probably on some list!

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From The Far Side:

The Final Theory: Rethinking Our Scientific Legacy

Are you tired of the endless science mysteries? Finally, solid answers have arrived! ☺

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THE NEW WANDERINGS

No. 13

April 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

This is the 1 Year Anniversary of the re-launch of my *Wanderings* column as *The New Wanderings*. I hope that you have enjoyed the many excellent DIY science projects that were presented during the year.

Please take a few minutes and send me an e-mail and let me know:

- Where you are located
- What you are your interests
- What you would like to see in *Wanderings*
- What you like about *Wanderings*
- What you do not like about *Wanderings*

One thing --- Please put "TNW" in the Subject Line so that my spam filter won't bump you.

Feature:

This month I am featuring a few of the many sites that will show us that we do not have to spend a lot of money in order to demonstrate science to our children.

Arvind Gupta

Arvind has selected 2513 videos, from his [Toys from Trash](#) site, to post on YouTube.

David Williamson

David seems to be able to build his marvellous machines with next to nothing.

Science Playwiths

This site offers activities that will take young people away from the keyboard and monitor and allow them to get their hands dirty.

The Home Scientist

Jim Hannon alerted me to this YouTube series which grew out of [Make Magazine's Science Room](#). Thanks, Jim.

Fun Science Project Ideas

Fun science projects for the student, teacher or homeschooler.

The Fun Science Gallery

In the Gallery, you will find instructions of how to build scientific equipments from relatively cheap materials.

Science Toys

This site will show you how to make inexpensive science toys, with common household materials, that will demonstrate fascinating scientific principles.

Bizarre Stuff You Can make in Your Kitchen

"This site is a museum of classic home science projects. It is not so much meant to be "how to" or educational, but more of a celebration of early to mid 20th century home experimentation and pop science illustration."

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Wanderings:

The Tricorder Project

Bennett Michael Harris just posted a link to this project, on the [Citizen Scientists League's FaceBook site](#). [The Tricorder Project](#) is “a really cool open hardware project to create a data observation, recording, and manipulation device inspired by the Tricorders from "Star Trek"”.

Petridish

Help to fund science & explore the world with renowned researchers

DIY Gears

Matthias Wandel demonstrates how we can quickly make wooden gears. This method should, also work with aluminum. [His Web site](#) has a nice selection of other projects.

An Inexpensive DIY Agarose Gel Electrophoresis System

“One of the most significant advances in recombinant DNA technology was the introduction of agarose gel electrophoresis as a method for separating and analyzing DNA fragments.”

The Virtual Robot Experimentation Platform (V-REP)

V-Rep is a 3D robot simulator, with an integrated development environment, based on a distributed control architecture.

Robert Hart's 18 Tube Geiger–Müller Cosmic Ray Hodoscope

Today, I saw a posting on the [SAS Face Book](#) page from Robert Hart. Back in #170 of the “old” Wanderings I had a couple of items regarding Robert's excellent work, as shown on his [Hardware Hacking](#) site. Check him out! Also, have a look at his [YouTube videos](#).

A Picture is Worth a Thousand Words!

Can you follow what the author is describing? I can't!

Range Finder

Here is the same project but this time illustrations are use which make things much clearer.

A Novel Range Finder

This simple range finder was originally published in the February 1939 issue of *American Photography*.

Pyrometers

A pyrometer or radiation thermometer is a non-contacting device that is used to measure thermal radiation emitted from an object.

[The Gizmologist's Lair](#)

"The Center for Research on Things You Shouldn't Try At Home"

[Stereography](#)

Stereography is the science of rendering a 3-d image in the mind of the viewer by using a pair of 2-d images.

[Meng Li's IR Heartbeat Monitor](#)

This simple circuit will display your pulse rate.

[The Auroral Chorus](#)

The Auroral Chorus opens the door to the realm of natural VLF radio phenomena "The (very beautiful) Music of the Magnetosphere and Space Weather"

[Radio Waves Below 22 kHz](#)

Explore the world of Nature's radio signals and other strange emissions at very low frequencies.

[The Inspire Project](#)

The goal of the Inspire Project is to bring the excitement of observing natural and manmade low frequency radio waves to students and citizen scientists.

[Laser Collimator](#)

Here is an inexpensive DIY laser collimator for aligning a Newtonian telescope.

[Natural pH-Indicators](#)

A DIY indicator made from red cabbage and red beet juice can measure the pH of a solution in the range of 1 to 13.

[Sensors](#)

Among the other items on his [Web site](#), Brooke Clarke, has included a detailed section on various types of sensors.

[More Sensors](#)

Michael Gasperi describes his DIY Lego NXT/RCX sensors and provides links to other similar sites. These sensors could possibly be made to work with other controllers.

[The Lego RCX Dissected!](#)

Here is a look into the inner workings of the Lego RCX microcontroller brick.

[X-Y Table](#)

Geir Andersen gives us a look at his awesome XY table design.

[A DIY Linear Accelerator](#)

DIY nuclear physics! Build an electrostatic accelerator in your basement.

For further examples of DIY accelerators have a look at the *Amateur Scientist* columns:

How to Make an Electrostatic Machine to Accelerate Both Electrons and Protons - January, 1959

How to Build a Machine to Produce Low-Energy Protons and Deuterons - August, 1971

[Cockroft Walton Voltage Multipliers](#)

Do you need a high voltage source?

[The First Cyclotron](#)

This is a collection of stories of the early particle accelerators and first cyclotrons

[The Mad Scientist Diary](#)

The ideas, experiences and projects of a *Mad Scientist in Training*

[Blog: I'm Going to Build an Ion Ray Gun](#)

A science blog

[Build a Low Cost Solar Siphon Heater](#)

[Build it Solar](#) links to plans describing how to build this simple low cost device that can be used to heat your home, shop, shed or barn.

[Warning: Scientific Content](#)

Blogging about Mythbusters and everyday science

[BlueSci](#)

The BlueSci magazine was established at Cambridge, in 2004, to provide a student forum for science communication.

[QR Code Generator](#)

This site allows you to generate your own [QA Codes](#). Why not give it a try!

[Toying With Science](#)

Simon Quellen Field has authored a series of short essays on various scientific topics.

[Science Starters](#)

Science Starters allows us to “find out about, take part in, and contribute to science through recreational activities and research projects.”
(From Darlene Cavalier via CSL FB on 24 Feb 2012)

[ION Newsletter](#)

The ION (Institute of Navigation) Newsletter is published quarterly and contains news other information geared toward the navigation community. There are many articles that may be of interest to the citizen scientist. For example see the articles regarding Einstein and navigation in the spring 2005 (GPS) and summer 2005 (gyrocompass) issues.

[Navworld](#)

Navworld is “the cyber-center for fostering continued interest in the art and science of navigation by providing you with navigational celebrations, famous historical accounts, interviews, biographies and navigation solutions for your needs.”

[10 Images that Changed the Course of Science](#)

The stories behind these images may have helped to change the course of history.

[The H Bomb Secret: How We Got it and Why We’re Telling it.](#)

This is a reprint from the November 1979 issue of progressive magazine.

[Teller–Ulam Design](#)

The Teller–Ulam design is the nuclear weapon design concept used in most of the world's nuclear weapons

[Ian Russell and Interactive Science Ltd](#)

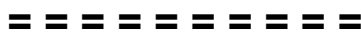
Ian Russell’s UK company, Interactive Science Ltd, produces some spectacular hands-on science exhibits.

[The Cleric Scientists](#)

This is a look at the Catholic Cleric Scientists down through the ages.

[The Online Library](#)

Here is a collection of on-line articles related to Catholicism and science.



From Instructables, YouTube & Make:

[Instructables: A Low Cost DIY Hobby XY Table](#)

At the heart of this table are common drawer glides.

[Instructables: An Arduino Controlled T-Slot XY Table](#)

Here is the design for another simple XY table.

[YouTube: Stirling Engine](#)

This simple Stirling engine, that was designed by Subir Bhaduri, should be easily duplicated even though the commentary is in Hindi.

[YouTube: Converting Cosmic Rays to Sound](#)

Forrest Mims used a Geiger counter to collect cosmic ray data, during a transatlantic flight. He then converted the data to music using an [musicalgorithm](#).

Forrest has several other “compositions” that he has posted on YouTube:

[Converting Tree Rings into Music](#)

[Musical Rendition of UV-B Atop Pikes Peak Modulated by Swirling Clouds](#)

[The Sound of the Sun's Ultraviolet Rays during One year \(2011\)](#)

[YouTube: What PI sounds Like](#)

Michael John Blake converts “pi” to music

If I may quote YouTube User,ELFogIalt17, --- “The best thing is that theoretically you can listen to it for ever...” 😊

[YouTube: What Tau Sounds Like](#)

And Michael's rendition of “tau”

[YouTube: Poor Man's Milling Machine](#)

If you're a tool or jig junkie, like I am, you'll love this one!

[YouTube: Mechanisms & Automata](#)

This is a display of some amusing mechanisms constructed from wood.

[YouTube: Syringes Are Used to Actuate a Mechanical Arm](#)

Syringes are used to demonstrate hydraulic principals.

[YouTube: Lewis and Clark's Air Rifle](#)

Lewis and Clarke had a Girandoni air rifle with them during their historic expedition.

[Make: Tesla's Fluidic Diode](#)

In 1920, Nikola Tesla was granted a patent for a "Valvular Conduit" or a type of one way valve with no moving parts.

[Make: Project Tips](#)

This is a collection of tips and links to assist you with your projects.

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The Kids Room:

[Free the Children](#)

"Young people everywhere have a right to be free from poverty, thirst, exploitation and disease."

[Sleeping Children Around the World](#)

Sleeping Children Around the World (SCAW) provides bed kits to children located in underdeveloped and developing countries.

[Scale of the Universe 2](#)

Fourteen year old Cary Huang, with help from his twin brother Michael, compiled this remarkable view of our universe --- from the smallest to the infinite. Further examples of their work can be seen on [their Web site](#).

[Homebrew Battery and Electrostatic Generator](#)

Make a simple lemon battery and an electrostatic generator.

[Make a Paper and Cardboard Medieval Castle](#)

This is a complete project that shows you how to make a medieval castle out of paper and cardboard.

[Make a Cardboard and Aluminum Foil AM Radio](#)

Here is a simple AM radio that is made from cardboard and a few odds and sods.

[ilovebacteria](#)

“The ilovebacteria.com web site was created to explain science to people who do not necessarily have a scientific background.” Why not try one of their experiments such as making [DIY pH indicators](#) using different coloured plants.

[The TeleToyland Sandbox](#)

You can control a robot, via the Internet, to draw in this sandbox.

[TeleToyland](#)

You can visit TeleToyland’s main site and see their other projects devoted to web robots, telepresence, web animatronics, animated and interactive web art, and interesting web cams.

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Women in Science:

[Rosalind Franklin and the Secret of Photo 51](#)

Should Rosalind Franklin have shared the Nobel Prize, with Watson and Crick, for the discovery of DNA's structure?

[The Science Cheerleaders](#)

Bringing science to the people

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Random Samples:

[The Global Alliance for Clean Cookstoves](#)

“The Global Alliance for Clean Cookstoves is a new public-private initiative to save lives, improve livelihoods, empower women, and combat climate change by creating a thriving global market for clean and efficient household cooking solutions.”

[The Hesperian Health Guides](#)

“The Hesperian Health Guides is a health information and health education source that supports individuals and communities in their struggles to realize the right to health. We develop easy to read materials that are produced in many languages.” Thanks, Sheldon, for finding this.

[The Titanic Universe](#)

15 Apr 2012 will commemorate the 100th anniversary of the sinking of the Titanic. BTW they got the ocean wrong! It was the Atlantic not the Arctic.

[Karl Sims' Puzzle Collection](#)

After trying to answer the puzzles in Karl's collection, take some time and look around [the rest of his site](#).

[Lists and More Lists](#)

Such as:

[20 Amazing Optical Illusions/](#)

[Another 10 Amazing Optical Illusions](#)

[12 Extremely Weird Names of Molecules](#)

And --- many more ----

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Suppliers and Stuff:

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

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

[Ginsing](#)

Make your Arduino sing with this synthesizer shield.

[Minecraft](#)

Minecraft is a game that lets you use blocks to build anything you can imagine.

[The Geometer's Sketchpad](#)

Sketchpad gives students a tangible, visual way to learn geometry, algebra, pre-calculus, and calculus.

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On The Lighter Side:

[The Titanic Hit an Ice Berg on 15 April 1912](#)

But what happened to the berg? Comedian, Les Barker, asks "Have you got any news of the iceberg?"

Science Cartoons

Enjoy a collection of science related cartoons from the [Nearing Zero Web site](#).

More Science Cartoons

Sidney Harris gives us a sample of his science cartoons.

===== 13 =====

THE NEW WANDERINGS

No. 14

May 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Feature:

There are millions of children, around the globe, who enjoy playing with those little plastic bricks called LEGO.

But big kids, or Citizen Scientists, can also use LEGO. Not so much as a toy but, instead, as a quick prototyping medium. LEGO offers a great variety of components, other than just the coloured bricks. These include wheels, gears, shafts, motors, sensors, pneumatics, computers ... and ... for those who may be interested ... little plastic people☺. LEGO offers an ideal system for prototyping your ideas as they can be used to quickly assemble, test and then modify as your vision evolves.

One of the LEGO systems that was developed for the older child or adult is the Mindstorm system. The Mindstorm, together with the RCX computer brick, enables a person to build and program a wide variety of devices.

Probably the majority of the LEGO work has been done with robots, but the possibilities are by no means limited to this area. In the examples, below, you will find links to a scanner, a plotter and a model spectrophotometer, which could be

expanded to become a full-fledged computer controlled scientific instrument made mostly out of LEGO bricks.

This week's Feature touches on the surface of the LEGO resources that can be found on the Web.

[What is LEGO?](#)

LEGO is a popular line of construction toys, consisting of interlocking plastic bricks, gears, wheels and various other parts.

[LEGO](#)

This is LEGO's Home Page

[LEGO Education Catalogues](#)

Download one of LEGO's online catalogues and see many of their exciting bits and pieces that you can't find at the local Toys-R-Us store.

[The Peeron LEGO Inventories](#)

The Peeron Inventory is a listing of many of the parts in the official LEGO sets.

[LEGO MindStorm](#)

The MindStorm System lets you design and program real robots.

[LEGO MINDSTORMS: *The Master's Technique*](#)

A book by Jin Sato

[Extreme NXT: *Extending the LEGO MINDSTORMS NXT to the Next Level*](#)

A book by Michael Gasperi and Philippe Hurbain

[LEGO Robolab](#)

LEGO Mindstorms sets that were designed for schools

[The LEGO RCX Computer](#)

Here is a description of the internals of the LEGO RCX computer brick.

[The LEGO RCX, Inside And Out](#)

Find out how to get up close and inside the LEGO RCX Microcontroller.

[LEGO RCX Plotter](#)

You can program this plotter to draw lines and print letters.

[LEGO NXT Image Scanner](#)

The NXT image scanner is a "stand alone" scanner that can scan and save images as a BMP-file in the NXT's flash memory.

[LEGO NXT Segway with Rider](#)

This robot simulates a [Segway PT](#), a self-balancing vehicle, by using the NXT Color Sensor as a simple proximity sensor to detect the approximate tilt angle of the robot enabling it to actually balance itself.

[NQC](#)

"Not Quite C" or "NQC" is a simple "C like" language for the RCX.

[LEGO Pneumatics?](#)

Here's something that you will NOT find at your local Toys-R-Us ☺

[LEGO Gears Tutorial](#)

"This is a complete tutorial on LEGO gears, their advantages and disadvantages as well as the basic laws of mechanics that apply to them."

[A LEGO Based Turing Machine & Much More](#)

If you are "into" LEGO, then Denis Cousineau's site is a must.

[A PID Controller for Lego Mindstorms Robots](#)

PID Control is a common technique used to control a wide range of processes. The complete mathematical description of PID control can be fairly complex but is not really required in order to use PID effectively.

[PID Tutorial](#)

What Is PID? A tutorial overview

[An Interactive PID Demonstration](#)

Play with PID control with a virtual liquid flow control system.

[PID Control Information](#)

This site contains some good links to PID pages.

[Arduino to LEGO Mindstorms Shield](#)

This shield allows your Arduino to control up to 4 LEGO NXT motors and read 4 NXT sensors.

[Lego Mindstorm vs Arduino](#)

Which is better?

[LEGO + Arduino = A Mini Segway](#)

Using an Arduino and a couple LEGO motors and sensors you could build your own self balancing robot.

[Homebrew LEGO Sensors](#)

Michael Gasperi's LEGO Mindstorms NXT/RCX Sensor Input Page

[Philo's Home Page](#)

Philo's page contains tips and information about LEGO Mindstorms and panoramic photography.

[LEGO Robot Pages](#)

The Dept. of Computer Science, Utrecht University, NL, used these in their investigation into whether they could use the LEGO Robots in their robotics courses.

[Matthias Wandel's Lego Domino Row Building Machine](#)

Have a look at some of Matthias' best LEGO creations.

[Exploring the Nanoworld with LEGO Bricks](#)

The purpose of this website to demonstrate, via 3 dimensional LEGO models, the various physical and chemical principles related to nanoscale science and technology.

[LEGO Push-Pull Logic Gates](#)

LEGO Logic Gates are along the line of [Babbage's](#) mechanical logic but with bricks.

[Andrew Lipson's LEGO Page of Interesting creations](#)

Here are a few of Andrew's creations for your delectation and delight.

[The LEGO Chess Robot](#)

This is a team project report by Stewart Gracie, Jonathan Matthey, David Rankin, and Konstantinos Topoglidis of the Engineering Dept. at the University of Glasgow.

There are many LEGO CAD programs, on the net. Do a Google search and find one that fits your needs and likes. The following are a few of the ones I found.

[LDraw](#)

"LDraw is an open standard for LEGO CAD programs that allow the user to create virtual LEGO models and scenes."

[LeoCAD](#)

"LeoCAD is a CAD program that can be used to create virtual LEGO models. It has an easy to use interface and currently features over 4000 different pieces created by the LDraw community."

[BlockCAD](#)

BlockCAD is a simple freeware program that can be used to build virtual models with LEGO like bricks.

[Lugnet: The LEGO Users](#)

Lugnet is an international organization that caters to all levels of LEGO enthusiasts.

[LEGO @ eBay](#)

Lastly, don't forget eBay as a possible source for good deals on LEGO components. But be cautious! Factor in the sellers shipping costs before you order. And what is the price at your local store?

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Wanderings:

[Citizen Science Enters a New Era](#)

"From China to the Congo, a new wave of volunteer science projects aims to allow amateur participants to actively gather data for the benefit of their communities."

[Views from Science](#)

Take a step into Eli Silk's *World of Citizen Science*.

[Charles Wenzel's Techlib Forum](#)

If you have enjoyed the [Techlib site](#), in the past, why not drop in on and take part in the discussions on the forum.

[CD4069 Atomic Frequency Standard](#)

While on his site, have a look at the little frequency standard, that Charles built, that runs off of the 60 (50) cycle power line --- "The line frequency is only fairly accurate at any given instant - perhaps within a few hundred PPM - but the long term error is kept very low by comparing the frequency with national time standards which are, of course, based on an array of atomic standards!"

[Bruce's Wimshurst Machine](#)

Bruce's machine is based on the plans at --- [Jake's Wimshurst Machine and How to Build It! \(Part 1\)](#)

[Electrostatic Machines](#)

While searching for information on Wimshurst machines, I came across this site which is a huge resource on static machines.

[The Stirling Builder](#)

Those who may be interested in Stirling Engines will enjoy Jim Larsen's excellent site.

[Make Your Own Circular Slide Rule](#)

Charles Kankelborg, a physics professor at Montana State University shows us how to build and use a circular slide rule.

[International Slide Rule Museum](#)

Step back into the old days when engineers worked it out with a stick ☺

[The Open Beam Construction System](#)

OpenBeam is a modern version of the [Erector](#) or [Meccano](#) sets that is planned to a low cost construction system aimed at the hobby and Maker market.

[The Xtal Set Society](#)

The Xtal Set Society is dedicated to building and experimenting with radio electronics, more specifically crystal radios.

[Bryan's Analytical Instrumentation Page](#)

"How to become an analytical chemist"

[DIY Instrumentation](#)

Hua-Zhong "Hogan" Yu and his colleagues, at Simon Fraser University, have turned to the laser-based optical read-write technology of DVD and CD players to create a biomedical diagnostics system that requires no hardware modifications.

[Build a Scanning Probe Microscope](#)

Here are free plans and instructions on how to build a Scanning Tunnelling Microscope (STM) for under \$100 US.

[How to Solder Aluminum](#)

I posted something similar to this, years ago, on the old SAS site. It DOES work. I used "3 in 1" oil and a high wattage soldering gun to tin the aluminum than I used my regular Weller W-60 to solder the wire(s) to the tinned patch.

[Laser Hacks](#)

Here is a collection of laser hacks and modifications that were found on the [Hack N Mod](#) Web Site.

[DIY ECG Machine on the Cheap](#)

Scott Harden devised an incredibly simple ECG machine with a minimum of parts to view the electrical activity of his heart.

[Homemade Flyback Secondary](#)

In Radu Motisan's blog, Pocket Magic, we are shown how to rewind a flyback transformer for better high voltage operation.

[Teslina's Experiment Page](#)

Tealina's site is devoted to Tesla Coils and other high voltage projects.

[The Globe at Night](#)

"The *Globe at Night* program is an international citizen-science campaign to raise public awareness of the impact of light pollution by inviting citizen-scientists to measure their night sky brightness and submit their observations to a website from a computer or smart phone."

[Space News](#)

Space.com is a great source for news of astronomy, sky watching, space exploration, commercial spaceflight and related technologies.

[Join the Hunt for Hubble's Hidden Treasures](#)

Take part in NASA's contest to find hidden treasure in the Hubble image database. Hurry! as the contest will soon close.

[The Cable Connector Tutorial Guide](#)

This is a reference of the various types of cables that are used to hook up various pieces of equipment?

[The Echochamber xkcd Forum](#)

I came across this forum, with science and math topics, as I was searching for some freeware forum software.

[phpBB](#)

Oh, by the way, this is the forum software that I was looking at when I found *Echochamber* in their examples.

[SMF](#)

Here is another package that I was looking at: ---"*Simple Machines Forum* — SMF in short — is a free, professional grade software package that allows you to set up your own online community within minutes."

[The Sudbury Neutrino Observatory](#)

"The Sudbury Neutrino Observatory (**SNO**) results have provided revolutionary insight into the properties of neutrinos and the core of the sun."

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From Instructables, YouTube & Make:

[Instructables: Intro to Arduino](#)

This is a little tutorial designed to introduce you to the Arduino and its capabilities.

[Instructables: Arduino Projects](#)

Here is a collection of Arduino projects that may inspire you to roll up your sleeves and try one or to develop your own project.

[Instructables: Weekly Challenge Archive](#)

The folks at *Instructables*, constantly, run weekly contests covering various topics. Give one a try!

[Instructables: How to Repair Ruined Vinyl Records](#)

Bfk shows us how it may be possible to bring ruined vinyl records back to life.

[Instructables: Oogoo a DIY Sugru Substitute](#)

Oogoo is an inexpensive silicone clay that is easily made substitute for [Sugru](#).

[YouTube: Spark Detector for Alpha Particles](#)

In this video, Carl Willis demonstrates his *Alpha Particle Spark Detector* that is based on a design by Tim Raney.

[Make : John Iovine: Geiger Counter Sanity Check](#)

MAKE's Paul Spinrad, from Make, interviewed John the recent run on Geiger counters. Also, see his [Spark Detector](#).

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The Kids Room:

[Taylor's Nuke Site](#)

Taylor Wilson, a 17 year old student, is interested with all things nuclear and radioactive and conducts research in related fields.

[Rock Around the World](#)

"Mars Scientists are asking students from around the world to help them understand the red planet. Send in a rock collected by you or your classroom from your region of the world and we will use a special tool like the one on the Mars Exploration Rovers to tell you what it's made of."

[Dr. Anne Marie Helmenstine's About Chemistry](#)

Follow Dr. Helmenstine as she guides you through the wonderful world of chemistry.

[Fun Science Project Idea's](#)

A collection of various project ideas that include Tesla coils, static electricity, heat engines, pneumatic projectile devices and other neat stuff

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Random Samples:

[The MIT IDEAS Global Challenge](#)

“The MIT IDEAS Global Challenge connects students with the passion and talent to improve the world with the experience and resources of the MIT community worldwide. We support innovation and entrepreneurship as public service through an annual competition that awards up to \$10,000 per team for the best ideas to tackle barriers to well being.”

[How To: Fly With Homemade Electronics](#)

“Most makers who travel with homemade electronic devices and other prototypes have a fear that their innocuous project will catapult them to the front page as a threat to national security.”

[13 Things That Do Not Make Sense](#)

Michael Brooks, at [The New Scientist](#), presents thirteen perplexing natural mysteries.

[13 More Things That Don't Make Sense](#)

Michael Brooks brings us 13 more mysteries.

[7 Inventors Killed By Their Inventions](#)

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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.

[Pitsco Education](#)

Pitsco is a great source of specialized LEGO components and kits and resources for classroom use.

[Esduino](#)

The Esduino is an Arduino-style board based on a 9S12C 16 bit microcontroller.

[Images Scientific Instruments](#)

Images SI is a source of Geiger counters, science, robotics and electronics kits and components.

[Surplus Sales of Nebraska](#)

They have over 20,000 individual items and hard to find RF components.

[Gyroscope.com](#)

Gyroscope.com is dedicated to all things gyroscopic plus they have a great selection of “high tech” toys.

[Rubidium Atomic Frequency Standard](#)

Have a look on eBay if you have a need for an atomic clock or any thing else that you can imagine.

[NCH Tone Generator Software](#)

The NCH Tone Generator generates sine, square, triangular, saw tooth, and impulse waveforms in the range of 1Hz to 22 kHz plus it is capable of generating white noise and pink noise.

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[From The Far Side:](#)

[Perhaps They Are Right!](#)

Are “the men in black” trying to stop experimentation in over unity devices?

===== **14** =====

THE NEW WANDERINGS

No. 15

June 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

I have noticed that many web sites and Internet services no longer support Microsoft's Internet Explorer IE7. Therefore, if you are still using IE7, you'll have to [upgrade your browser](#) in order to view these sites.

Feature:

**"Fillet of a fenny snake
In the cauldron boil and bake
Eye of newt, and toe of frog
Wool of bat, and tongue of dog
Adder's fork, and blind-worm's sting
Lizard's leg, and howlet's wing
For a charm of powerful trouble
Like a hell-broth boil and bubble."**

[William Shakespeare](#) ---- [Macbeth \(IV, i, 14-15\)](#)

It is speculated that the items in the Witches Brew may be alternate names for plant based ingredients. For example, in a post to *wiki.answers.com*, Kristina Allen-Bradley said "The term "eye" in herbal folklore actually means the inner part of a blossom and "Newt" is a type of mustard plant with black seeds. If you finish that quote with "toe of frog", "toe" stands for the leaf, and "frog" is an old name for the plant cinquefoil."

Now what does this have to do with Citizen Science? Well, thinking along similar lines, I thought that it might be of historical interest to the readers of the [Citizen Scientist League Blog](#) to post the ***Table of Obsolete Chemicals*** that appeared on pages 654 and 655 of the 2000 [Dixie Gun Works](#) catalogue. After receiving permission from them to allow me to post the table, I did a quick Web search spot check several of the items and found several sites that had an almost identical table to the one in the catalogue.

Therefore, instead of transcribing the table from the DGW catalogue, I took the easy way and saved myself a ton of work, and am posting the links to the sites that I found.

So if some of you want to try that formula that you found in some old scroll you may be able to find the modern equivalent to the ingredients in one of these links.

[Chemical Cross Reference](#)

This list was found in the ftp archives of a [Living History Group](#).

[Chemical Names of Common Substances](#)

Dr. Anne Marie Helmenstine, at About.com, compiled this list of alternate chemical names of familiar materials.

[Common Versus Chemical Names](#)

The *Two Wanna Bees* site has a list of some of the more well-known chemicals and their commonly used names. They also post [a list of chemicals](#) that we may come in contact with during our daily activities.

And for the alchemist or sorcerer the following may be of interest:

[Alchemical and Archaic Chemistry Terms](#)

This list is from the [Alchemy Web Site](#)

[A Guide to Medicinal and Aromatic Plants](#)

"We hope that this web site will provide technical assistance to you in your search for sound scientific information about medicinal, spice and aromatic plants, and in particular be of benefit in the introduction and production of these unique and fascinating specialty crops and natural plant products."

[Dr. Duke's Phytochemical and Ethnobotanical Databases](#)

Dr. Duke's site is an extensive index of the activities of many plants and chemicals.

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Wanderings:

[Can Amateur Scientists Do Theoretical Science?](#)

"It's hard enough for amateur scientists to do any kind of science, and be taken seriously. But theoretical science appears to be 100% the domain of professionals. Is there any way that amateur scientists can make a useful contribution to the development of scientific theories?"

[Conspiracy of Light](#)

"This website examines historical and modern experiments on the nature of space and light, and possible new interpretations based on an alternative approach to the scientific evidence at hand."

[Millersville University's Experiment of the Month Archive](#)

"Experimentation is the cornerstone of science." The experiments, in this archive, do not have detailed instructions. It is hoped that each experimenter will come up with their own unique interpolation.

In the archive you will find the description for [A Simple Piston Driven Pendulum](#) that can be used to build a [Foucault Pendulum](#) and demonstrate that the earth turns.

[Build a DIY Photocell](#)

Alan D. Gleue shows you how to build Grätzel photovoltaic cells

[DIY Projects @ Research Media & Cybernetics](#)

RM Cybernetics supplies information and products for scientific education and research.

[The Alternate Energy Resource Network](#)

There are many interesting projects that are linked from this site. Be aware, though, some of them are "over the edge".

[DIY Thermal Photography](#)

The [Public Laboratory](#) shows us how to take thermal photographs using a DIY Thermal Flashlight.

[**A Speed of Light Demonstration by the Foucault Method**](#)

Foucault's original technique is easy to set up in the classroom and makes an excellent way to measure the speed of light.

[**The Foucault Method of Measuring the Speed of Light**](#)

This site goes into the Foucault Method a bit deeper.

[**Using a Laser to Measure the Speed of Light in Gelatin**](#)

Outfit yourself with a simple handheld laser pointer, a protractor, and gelatin and you're ready to measure the speed of light.

[**Measure the Speed of Light**](#)

It will be demonstrated, in this experiment, that a fairly sophisticated measurement can be conducted with a few inexpensive items.

[**Blinkenlight**](#)

Udo Klein presents several experiments that are based on the [**Arduino Blinkenlight Shield**](#).

[**Hacklog**](#)

You may find an interesting item among the many pages of ideas at the Hacklog site.

[**Do It Yourself Gadgets**](#)

Try your hand at some of these interesting DIY projects.

[**DIY Geomagnetic Storm Monitoring Magnetometer**](#)

This site kicks the [**Simple Pop Bottle Magnetometer**](#) up a notch or two.

[**The Mystery of Dark-Matter**](#)

A new study by the European Southern Observatory claims that this now established theory could be in trouble.

[**The Electric Universe**](#)

"The Electric Universe theory highlights the importance of electricity throughout the Universe."

[**Autodesk's 123D Family of Programs**](#)

The *Autodesk 123D* family of free 3D design apps work with each other to help you make your ideas real.

[**FFT for Dummies**](#)

Renato Romero simplifies Fast Fourier Transforms for us dummies 😊

[Images of Earth Surrounded in Space Junk](#)

You'd think that people would clean up after themselves ☺ The European Space Agency (ESA) has released computer generated virtual images of space junk that is floating around Earth.

[Another Compiler for Arduino](#)

BASCOM is a BASIC compiler for the Arduino family. It will produce code that is more compact and faster than Arduino 'C'.

[OpenRelief](#)

The OpenRelief project's aim is to assist disaster relief efforts by developing better communications tools such as their [Robot Plane](#) or Drone prototype.

[DesignSpark](#)

The gateway to online resources and design support for engineers

[DesignSpark PCB](#)

DesignSpark PCB is a free and easy to use printed circuit design tool.

[The Electropaedia](#)

"This site provides a comprehensive knowledge base about energy supply and battery technologies, battery applications, chargers and ancillary equipment."

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From Instructables, YouTube & Make:

[Instructables: Microcontroller Interface to Forrest Mims's Electrometer](#)

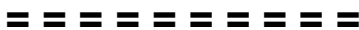
With a few components, a microcontroller and an old Coleman's Mustard Powder tin, the author was able to build a device to measure static electricity based on a design by Forrest Mims.

[Instructables: Make Quantum Dots](#)

The NurdRage demonstrates how to make cadmium selenide [quantum dots](#). Visit their [web site](#) to see their other experiments.

[YouTube: The Geekgroup](#)

"The Geek Group is a non-profit science and technology educational organization dedicated to creating a peer group and support network for anyone with a sincere and passionate desire to learn."



The Kids Room:

[Steve Lower's Resources for Chemistry Education](#)

Steve has a collection of general chemistry resources for teachers and students.

[A Lab for the Future](#)

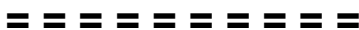
NSM students get new state-of-the-art science facility

[Teach Engineering](#)

Teach Engineering is a web-based library collection of standards-based engineering curricula for use by K-12 teachers.

[JVC's Science Fair Projects](#)

This is your guide to science fair topics, ideas, experiments, and winning displays.



Random Samples:

[Google Celebrates Bob Moog's Legacy with a Fully Playable Synthesizer](#)

Note: This should be run with the Google Chrome browser.

[How to play the Moog Doodle](#)

Jacob Turcotte, a staff writer with The Christian Science Monitor, explains the operation of Google's Synthesizer a little deeper.

[Journey to Forever](#)

The Journey's focus is on DIY technology in the fields of sustainable energy, sustainable farming, family nutrition and local self-reliance.

[Hinton's Lilac Chaser](#)

View this startling optical illusion

[Military Compasses](#)

Ted Brink shows us his extensive collection of military compasses from around the world.

[Home Made Tools](#)

This is an online forum for DIY Tool Builders

[Kindle for PC](#)

With this free app from Amazon, you will be able to read Kindle books on your PC.

[The Young Bill Gates \(1976\)](#)

Read Bill's comments on Software Pirates.

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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.

[United Nuclear Scientific Supplies](#)

The items that are stocked by *United Nuclear Scientific Supplies* are geared to help us to put the "fun" back into science.

[Power Switch Tail II](#)

Easily control 120vac from your PC or microcontroller.

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From The Far Side:

[Pseudoscience](#)

Stephen Lower gives us a look at pseudoscience, pathological science, junk science, hoax science, fraudulent science, scientific misconduct and lastly bad science.

[Water Related Pseudoscience, Fantasy and Quackery](#)

The purpose of this site is to examine the credibility of so called "wonder waters" such as ionized, alkaline and oxygenated waters from the standpoint of modern chemistry and physiology.

Secrets of Egypt's Pyramids

Professor Michel Barsoum reports that he has found evidence suggesting some of the stone blocks were cast, not quarried.

Are Aliens Artists?

Here is a collection of 110 Crop Circles that prove that aliens or perhaps supernatural beings appreciate the visual arts ☺

The Circle Makers

Than to burst our bubble, here is a group of British humans that document how they, not **Greys**, make crop circles ☺

Loohan's Orgone Site

Join Loohan in his search of negative Extra-Terrestrials, Black Magicians, Illuminati, Demons and various Evil Spirits.

===== 15 =====

THE NEW WANDERINGS

No. 16

July 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Feature:

I like spiders and snakes and can tolerate mosquitoes and black flies to some extent, but I can't stand [ticks](#). They are in a class all of their own!

I was surprised to find ticks in central Nova Scotia, where our camp is located. For a long time, their presents have been known in the southwestern part of the province but with the current changes in climate they seem to be migrating north.

Here are a few tick related links that I have found about this pest:

[Some Tick Tech](#)

A short look into the life cycle of the tick

[The Tick Patrol](#)

An Austrian school has developed elective courses in genetic- and biotechnology to investigate the contagiousness, possible treatments and diagnosis of Lyme disease and tick-borne encephalitis.

[The Grand Tick Hunt](#)

Tick guru [David Simser](#), PhD hunts for ticks in Nottingham, NH.

[How to Make a Tick Trap](#)

This simple trap may rid your area of pesky critters.

[DIY CO₂ Generator](#)

I wonder if this generator could produce enough CO₂ for the trap.

[DIY Tick and Mosquito Repellent](#)

I am trying a variation of this formula and will try and report back at the end of "tick season".

[The Tick Key](#)

This little gizmo really works!

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Wanderings:

[Nuclear Magnetic Resonance Spectroscopy](#)

What is Nuclear Magnetic Resonance Spectroscopy?

[Home Built Nuclear Magnetic Resonance \(NMR \) Spectrometer](#)

Doug Marett describes his DIY NMR setup. [Check it out on YouTube.](#)

[How Amateurs Can Build a Simple Magnetic-Resonance Spectrometer](#)

by C. L. Stong April, 1959

[The Model T Ignition Coil](#)

One of these coils was responsible in getting me interested in science. And I managed to hold on to it over the years.

[The Model T Buzzer Coil](#)

Here is a little more info on these induction coils.

[Microbial Fuel Cell](#)

In Make Magazine #30 there is an article by Ashley Franks. This article describes the DIY construction of a MudWatt, which is a battery powered by bacterial action. You can try and gather the components yourself or take the easy way and order a kit from [Keegotech](#).

[US Navy's Benthic Unattended Generator \(BUG\)](#)

If you think that the “mud battery” technology is just a laboratory curiosity, think again.

[Using Ocean Waves To Generate Electrical Power](#)

A simple buoy system is used to generate electrical power. [See a prototype in action on YouTube.](#)

[Reading the Vernier Caliper](#)

This short tutorial shows you how to read a vernier scale.

[How to use a Micrometer](#)

The micrometer is one of the most accurate mechanical measuring devices in common use.

[DarwinTunes](#)

“Join our unique experiment, and be the first to hear music as it evolves, right between your ears!”

[The Visionlearning Blog](#)

“Darwin Tunes: Scientists examine how consumer choice can drive the evolution of music from noise.”

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From Instructables & YouTube:

[YouTube --- Galileo Ferraris - Inventor of the Induction Motor](#)

Galileo Ferraris: Physicist, Pioneer of Alternating Current Systems (1847-1897) Inventor of the Induction Motor "Father of three-phase current" - Electrotechnical Congress, Frankfurt 1891

[YouTube --- How to Turn a Sphere Inside Out --- Part - I](#)

This is a theoretical look at turning a sphere inside out.

[YouTube --- How to Turn a Sphere Inside Out --- Part - II](#)

Part II is a continuation of Part I.

[YouTube --- Fish Tail Boat](#)

Here is another excellent video from [Arvind Gupta](#).

[YouTube --- DIY Road Case Introduction](#)

This video introduces [Reliable Hardware's](#) complete series of 11 DIY Road Case videos. It is an overview of techniques for designing a Road Case, installing recessed handles, recessed latches, working with aluminum extrusions plus installing carpet and foam.

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The Kids Room:

[Super-Awesome Sylvia's Maker Show](#)

10 year old Sylvia Tod shares her love for "making" on her Web Site. Check it out!

[Visionlearning](#)

Visionlearning is an educational resource for faculty and students that is funded by the [National Science Foundation](#).

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Women in Science:

[Contributions of 20th Century Women to Physics](#)

"An archive presenting and documenting some important and original contributions made before 1976 by 20th century women."

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Random Samples:

[The Book of Beasts](#)

"White's *The Bestiary: A Book of Beasts* was the first and, for a time, the only English translation of a medieval bestiary. Bestiaries were second only to the Bible in their popularity and wide distribution during the Middle Ages."

[Medieval Bestiary](#)

This site is the long-term project of David Badke. His goal is to gather information about the Medieval Bestiary as well as related information on the Medieval view of animals in general, both fabulous and real.

[Udacity](#)

Udacity is a totally new kind of learning experience. You learn by solving challenging problems and pursuing audacious projects with world-renowned university instructors. All on line and for free!

[3DTin](#)

3DTin is a free program that enables you to create 3D drawings. Note --- It requires that you use the [Google Chrome](#) browser.

[Tinkercad](#)

Tinkercad is another easy utility to learn how to create 3D designs.

[Google's World Wonders](#)

"Google's World Wonders Project aims to bring to life the wonders of the modern and ancient world."

[Daily Writing Tips](#)

"Whether you are an attorney, manager or student, writing skills are essential to your success. The rise of the information age – with the proliferation of e-mails, blogs and social networks – makes the ability to write clear, correct English more important than ever."

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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.

[All Electronics](#)

All Electronics is a supplier of a wide variety of new and surplus electronic components

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On The Lighter Side:

Where's Waldo?



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From The Far Side:

Colloidal Silver

Read about the DIY “cure all” that will fix all that ails you!

Argyria

One of the most dramatic symptom of the use of colloidal silver is argyria. This is a condition that causes the users skin to become blue or bluish-grey in colour.

The Effects of Argyria

Paul Karason’s entire skin gradually turned blue after consuming colloidal silver that he made himself.

===== 16 =====

THE NEW WANDERINGS

No. 17

August 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Unfortunately, there will be no column this month.

===== 17 =====

THE NEW WANDERINGS

No. 18

September 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Feature:

This was, originally, going to be August's column, but I could just not find the time to post it up on the site.

Hopefully, things will get back, somewhat, to normal in the fall.

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Wanderings:

HeatSync Labs

HeatSync Labs is a nonprofit hackerspace in Arizona. Our objective is to empower engineers, artists, and inventors to push the limits of technology beyond its intended use.

[SEM Buildblog](#)

This site documents the inception and build of the Heatsync Labs Scanning Electron Microscope. Also see their [YouTube presentation](#).

[Millefiori: Ferrofluid Mixed with Water Colors](#)

These thumbnail sized images were created by mixing ferrofluid with water color and putting it into a magnetic field.

[Sci-Spot](#)

Check out *Sci-Spot* for a source for amateur science information and supplies.

[DIY Ferrofluid](#)

Sci-Spot shows us how to make ferrofluid.

[Ferrofluids from POPSCI](#)

Popular Science shows several receipts for making ferrofluids.

[The Puget Sound Knappers](#)

This site's purpose is to serve as a platform to promote and practice [knapping](#) basics and skills.

[An Experimental Infrasound Detector](#)

Jim Hale constructs a simple Infrasound Detector

[The Inexpensive Infrasound Monitor Project](#)

Here is detailed information on a low-cost design for a microbarograph that can detect and monitor infrasound (sound less than 20 Hz)

[Can A Static Spark Set Off Black Powder?](#)

Yes --- But it ain't easy!

[Drones: From War Weapon To Homemade Toy](#)

An interesting article by Larry Abramson

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From Instructables, YouTube & Make:

[Instructables: Magnetic Silly Putty](#)

Try some DIY magnetic silly-putty to complement your ferrofluid

[Instructables: A Cathode Ray Tube in a Wine Bottle](#)

“This simple project will allow you to investigate a variety of intriguing effects including magnetic deflection of an electron beam, Crookes dark space, plasma striations in a gas discharge tube, and many others.”

[YouTube: Homemade Particle Accelerator #1](#)

Here is a short look at amateur built accelerators.

[YouTube: Homemade Particle Accelerator #2](#)

Boy! I LOVE that music!!!

[YouTube: Michio Kaku: An Atom Smasher in the Garage](#)

Thanks to a myopic Congress, the U.S. now lags behind Europe in particle physics research.

[YouTube: Blow Tube](#)

Once more, Arvind Gupta shows his great skill in changing trash into scientific demonstrations. This time he looks into Bernoulli's Principle.

[Make: 9-Year-Old's DIY Cardboard Arcade](#)

A 9-year-old boy's day is “made” when his elaborate DIY cardboard arcade. Gets flashmoted.

[Make: School's Out! Best Summer Ever Special Issue](#)

Most of the projects, in this magazine, are just pointers to the full documentation on their web site.

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Random Samples:

[Smithsonian Institution Research Information System \(SIRIS\)](#)

SIRIS is your gate way to a great collection archived information.

[SIRIS Search for “Amateur Science”](#)

Here is an example of a SIRIS search.

US Army Manuals

Many of the Army’s manuals are available on line.

The World Oral Literature Project

The World Oral Literature Project is “an urgent global initiative to document and make accessible endangered oral literatures before they disappear without record.”

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Suppliers and Stuff:

RSpec Explorer / Real-time Classroom Spectroscopy

Tom Field sent me this link to a terrific PC based spectroscope.

United Kingdom Geologists Equipment (UKGE)

UKGE can supply, world wide, a wide variety of Earth Science Equipment, Tools and Books, Geological Maps, Field Equipment, Navigation / Safety Wear, stone tumblers and microscopes and much more.

Tinker Toys for Grown-Ups

Build Anything with PVC

The Gurkha Kukri

The kukri (various spellings) is the traditional knife of the **Gurkha** soldiers from Nepal. The best ones are hand made by skilled smiths working out of their home forges. **See how a kukri is made**. Also, have a look at **this site**.

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THE NEW WANDERINGS

No. 19

October 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Wanderings:

Science Starter

“This is the place to find out about, take part in, and contribute to science through recreational activities and research projects.”

Do It Yourself and Save

An article in [Science Daily](#) reports how 3D printers and micro controllers are driving down the cost of doing science.

Amateur Science

Here is an Amateur Science Blog from “Down Under” in New Zealand. It is well worth a read.

Hardware Hacking

Have a look at Robert Hart’s various projects.

Halbach Array Motor/Generator

This is the description of a novel generalized electric machine.

[A DIY Amateur Torsion Magnetometer](#)

Last month I had a reference to Tom Field's [PC Based Spectroscope](#). Tom has also developed software that uses a webcam to record the output from a Torsion Magnetometer.

[DIY Glove Box](#)

[The Public Laboratory](#) shows how to build a crude glove box. While there, have a look at [their other tools](#).

Note: This site does not like MS Internet Explorer.

[Practical Spectral Photography](#)

The authors introduce a low-cost and compact spectral imaging camera design based on unmodified consumer cameras and a custom camera objective.

[Sam's Laser FAQ](#)

"A Practical Guide to Lasers for Experimenters and Hobbyists"

[A Short History of the Inyo Force-Balance Vertical Seismometer](#)

This paper describes the activities of a group who collaborated in the design and construction of a force-balance vertical seismometer. The following two directories contain many interesting documents and diagrams relating to the design of the force-balance vertical seismometer:

[FBV](#)
[Seismo](#)

[Earthquakes](#)

[John C. Lahr](#) included many earthquake and seismology links on his [Fun With Science](#) Web Site.

[How to Build a Slinky Seismometer](#)

Slinky seismometers are very sensitive to the p-, s- waves that are produced by earthquakes.

[Introduction to Earth Tides](#)

This Power Point presentation was prepared by Michel Van Camp at the Royal Observatory of Belgium.

[Conservation Drones](#)

The purpose of the Conservation Drones' website is to share their knowledge of building low-cost drones that could be used by conservation workers and researchers to do their jobs a lot more effectively.

[Canada's State of the Oceans Report, 2012](#)

Canada's State of the Oceans Report 2012 presents highlights from regional reports on the five Large Ocean Management Areas that were established under the **[Health of the Oceans Initiative](#)**.

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From Instructables, YouTube & Make:

[Instructables: Make this Electrostatic Motor From Scrap](#)

This motor can be built using stuff that you should have around the house. But you may have to rob the kids' toy box for the plastic horse shoes ☺.

[Instructables: Vortex-Drive Micro ROV](#)

A pager motor is at the heart of this micro-ROV.

[Instructables: DIY Testing for HCN from ABS and Nylon 3D Print Material](#)

“The intent of this DIY is to explain how to build a test apparatus to determine the safety of the material you are using to print your parts.”

[YouTube: Travel INSIDE a Black Hole](#)

This is a simulation of what it would be like to travel close to and inside a black hole.

[YouTube: Infinity Is Bigger Than You Think](#)

Dr James Grime explains that sometimes infinity is even bigger than you think.

[YouTube: The Numberphile Videos](#)

Here is a collection of other **[Numberphile](#)** videos on YouTube.

[Make: How Tracking Down a Stolen Computer Triggered a Drug Bust](#)

This is a story about how someone tracked down their stolen computer.

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The Kids Room:

[15 Year-Old is Developing a Test for Pancreatic Cancer](#)

15-Year-Old, Jack Andraka, is developing a test for pancreatic cancer that may be better than what is currently being used.

[QuarkNet: The science connection you've been waiting for!](#)

QuarkNet enables “high school students, teachers and physicists working together on physics research projects exploring the hidden nature of matter, energy, space and time.”

[The Edible/Inedible Experiments Archive](#)

These experiments are from the Mad Science Archive. Try your hand at experimental science! Some experiments may be eaten before, during or after the experiment, and some should not be eaten at all!”

[Rate Your Professor](#)

Find your Professor / College and see how they rate.

[Hila Projects](#)

These projects have been developed and tested at Hila Science Camp. They have also produced a collection of [YouTube Videos](#).

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Random Samples:

[Circular Saw Cutting Guide](#)

I could not make a nice straight free hand cut, with a skill saw, if my life depended on it. If any of you have a similar problem, than this guide is just what you need.

[The Coffee Mug Knife Sharpener](#)

Michael Cantrell shows us how to use the unglazed bottom of a mug to sharpen a blade.

[Block Posters](#)

This free service allows you to create any size wall posters from any size image.

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Suppliers and Stuff:

[DHT11 Temperature and Humidity Sensor](#)

The DHT11 is an Arduino compatible digital sensor with a 0-50 ± 2°C temperature range and a 20-90% ± 5% RH humidity range.

[Photomultiplier Tube](#)

There is a wide selection of Photomultiplier Tubes available on EBay.

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THE NEW WANDERINGS

No. 20

November 2012

Ralph J. Coppola

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<http://citizenscientistsleague.com/>

Feature:

Sensors

This site describes a wide selection of sensors that measure every conceivable phenomenon.

Piezo Sensors

These unique devices have many possible applications.

Piezo Film Blood Pressure Monitor Project

The purpose of this project is to design and build a reliable, low power, low cost blood flow sensor.

The Data Acquisition Handbook

How to collect, process and use sensor data

[The Digital Modeling of a Simple RC Low Pass Filter](#)

Most sensor output must be filtered or smoothed before it can be used. If the data is in an analog format a simple RC Filter may be used. But with digital data software techniques must be used.

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Wanderings:

[Time & Frequency](#)

Brooke Clarke's fascination with Time and Frequency started in childhood.

[Experimental Rocketry Web Site](#)

Richard Nakka --- Aerostructures Engineer by day --- Experimental Rocketeer by night.

[Sugar Shot to Space](#)

The goal of this project is to loft a rocket, using a classic low-tech sugar based propellant, into space (100 km altitude).

[Pulse Jet Engines](#)

This site is run by a collection of like-minded hobby geeks & and back yard scientists who wish to share some of the knowledge that they have acquired.

[Hack a Week](#)

Join Dino Segovis as he presents a new DIY project each week.

[DIY With Kipkay](#)

Kip Kedgesha (a.k.a Kipkay) is best known for his projects that appear in *Make Magazine* and on *YouTube*.

[Evil Mad Scientist Laboratories](#)

"Making the World a Better Place, One Evil Mad Scientist at a time"

[Electrostatic Machines](#)

Dr. Antonio Carlos M. de Queiroz has assembled a vast resource for experimenters who may be interested in Electrostatic Machines.

[The Tricorder Project](#)

The Tricorder Project is an open source effort to develop handheld devices that can sense a diverse array of phenomena that we can't normally see.

[The Meteoritical Society](#)

The Meteoritical Society is an organization that was founded to promote the study of extraterrestrial materials, including meteorites and space mission returned samples.

[SEED: Seeking Dialogue Between Art and Science](#)

SEED is a Dublin-based group devoted to developing creative projects connecting art and science, including informal salons, exhibitions, workshops and performances.

[The Believers](#)

Cold Fusion --- The "Holy Grail" or junk science?

[Edmund Storms: Taking the Chill Out of Cold Fusion.](#)

"This site is designed to keep you informed about the latest research done on Cold Fusion (CANR) by Dr. Edmund Storms."

[DIY Cold Fusion](#)

JLN Labs shows how you can experiment with Cold Fusion.

[Phylo](#)

Phylo is a human-based computing framework that applies "crowd sourcing" techniques to solve the Multiple Sequence Alignment (MSA) problem.

[e-Book Browser](#)

The e-Book Browser allows you to search the Internet for e-books by subject or by title.

[The Most Embarrassing Moments in the History of Science](#)

Take the quiz and see how you make out.

[How Can Parts of Canada be 'Missing' Gravity?](#)

The gravity in the Hudson Bay area and surrounding regions is lower than it is in other parts of the world.

[North American Crayfish Are an Invasive Species in Scottish Waters](#)

Investigation work is planned following reports of a potentially devastating invasive species being discovered for the first time in the River Nith, Scotland.

[Cheap Colour Test Picks Up HIV](#)

UK researchers have developed an inexpensive test that may be able to detect the HIV virus.

[Language Lessons Told Through Twitter](#)

Some linguists are using Twitter to chart the evolution of language through the spread of slang expressions.

[Climate Change is Contributing to Hybridization in Polar Species](#)

Researchers are trying to determine how much damage the Arctic hybridizations will cause.

[Climate Change and Invasive Species](#)

Climate change is rendering some parts of Canada, such as the Arctic, more vulnerable to invasive plant and animal species.

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From Instructables, YouTube & Make:

[Instructables: Blue LED Transilluminator](#)

This Instructable describes how to make a blue LED transilluminator for DNA imaging using SYBR safe dyes. Also, see the [IO Rodeo Web Site](#).

[Instructables: Asymmetrical Capacitor Thruster](#)

This Instructable shows you how to build a Biefeld-Brown thruster but is not a debate on Brown's electrogravitic theories.

[Instructable: A Simple DIY Spectrophotometer](#)

This Instructable will explain how to build a fairly basic but working spectrophotometer out of easily sourced parts.

[Instructables: Connect a GPS Receiver to Google Earth](#)

Track a GPS receiver's position in Google earth.

YouTube: Novel Gear Drives

[A System Changes Direction](#)

[A System That Changes Speed](#)

[YouTube: The Galaxy](#)

A quick look at the Galaxy!

[YouTube: Ultra-high Definition View of the 2012 Venus Transit](#)

On 5 June, NASA's Solar Dynamics Observatory collected these images as Venus the transits across the face of the sun.

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The Kids Room:

The Global Cardboard Challenge

In TNW #18, we were introduced to 9 year old [Caine Monroy](#) and his DIY Arcade. Now, Caine's creativity spawned *The Global Cardboard Challenge* that introduces children to cooperation, science, math and engineering activities.

Think for Yourself

The Musings of an Irish Physics Teacher

Science Fair Project Idea

Do you have access to some pond scum? If not, you can grow your own and experiment with biodiesel production.

Does the future of Algae for Biodiesel look good?

Here are some opinions on the subject.

Instructables: A DIY Algae Bioreactor

You can build an Algae Bioreactor from recycled plastic bottles.

Vampire Physics

The Vampire Physics game is similar to [Crayon Physics](#). Caution! Both games are highly addictive ☺

Draw a Snowflake

The Evil Mad Scientist reviews a free downloadable Vector Snowflake Application.

How Things Are Made

How Products Are Made gives a short explanation of the manufacturing process of a wide variety of products.

Storm the Castle

This collection of projects should keep you busy on many rainy weekends.

Museum Institute for Teaching Science

"Promoting inquiry-based, hands-on science education"

Students On Ice

This award-winning organization offers unique educational expeditions to the Arctic and Antarctic for students, educators and scientists from around the world.

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Women in Science:

[GoldieBlox: Engineering Toys for Girls](#)

Debbie Sterling has developed engineering toys especially for girls.

[Messages from GoldieBlox Backers](#)

A group of experts comment on the GoldieBlox System.

[Brittany Wenger Recently Won This Year's Google Science Fair](#)

Teen girl wins [Google Science Fair](#) for the design of a breast cancer computer program.

[A Low Cost Drinking Water Purification System](#)

16 year old [Sabera Talukder](#) developed an inexpensive water treatment system for use in developing countries.

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Random Samples:

[Little Dresses for Africa](#)

Little Dresses for Africa is a non-profit organization that distributes simple dresses that are made out of pillowcases, to the children of Africa.

[Web of Stories](#)

"Web of Stories began as an archive of life stories told by some of the great scientists of our time."

[Drill Bit Size Chart](#)

This chart will enable you to pick the correct drill size, whether it is Fraction, Letter, Number or Metric, for the hole size that you wish to drill.

[How to Drill a Hole in a Round Object](#)

With this little jig you can easily drill holes in round stock.

[World Time Zones Map](#)

This map shows the World's time zones in 24 hour format.

[Could You Pass a US Citizenship Test?](#)

Take the test and see how you measure up.

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Suppliers and Stuff:

[DATAQ Instruments Analog to Digital Converters](#)

DATAQ offers a wide selection of low cost ADC starter kits

[The Adafruit Ultimate GPS Module](#)

This Arduino compatible GPS module comes fully loaded and is easy to use. The built in data logger could be one of the module's best features. There is enough internal memory to log the date, time, latitude, longitude, and altitude at 15 sec intervals for 16 hours.

[Adafruit Data Logger for the Arduino](#)

This shield allows your Arduino to log data to a SD card.

[Photosounder](#)

The Photosounder program allows you to transform any sound to an image and to create sounds from an image.

[Educational Innovations,](#)

Here is a site that offers many science related products.

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THE NEW WANDERINGS

No. 21

December 2012

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As you may have noticed, the posting of this *Wanderings* is VERY late. I must apologise, but other matters had to take a priority. Additionally, I have to inform you that this will be the last *Wanderings*, for the time being, but I hope to be able to start up again later in the Spring.

Wanderings:

Wind Powered Bamboo Minesweeper

Afghani designer Massoud Hassani has been nominated for the *Designs of the Year 2012 award* from London's Museum of Design for his invention of a wind powered bamboo minesweeper.

The Computational Design Lab

Check out the many interesting projects at the lab.

Amateur Biology Blog

This blog has links to many biology databases.

BIO Short Labs

[DIY BIO](#)

“DIYbio.org is an organization dedicated to making biology an accessible pursuit for citizen scientists, amateur biologists and biological engineers who value openness and safety.”

[BioCurious](#)

BioCurious is a San Francisco Bay Area hackerspace that is devoted to the [DIYBIO](#) community.

[What Materials Glow Under Ultraviolet Light?](#)

A recent TV program that was investigating the cleanliness of hotel rooms convinced me to buy a UV flashlight ☹

[Black Light Flashlight Hack!](#)

Kip Kay shows us how to modify a LED flashlight so that it can be used to locate “Nasty Stains”. ☹

[CS Alloys](#)

CS Alloys are a family of low melt or fusible alloys, composed of bismuth, lead, tin, cadmium, and indium, that find application in many fields. I recently purchased a bar of [Cerrosafe](#) to make a casting of a rifle chamber.

[Wood's Metal](#)

The Wood's Metal alloy is similar to the CS Alloys.

[DIY Machinable Wax](#)

Here is Jim Hannon's description of his initial experiments with a DIY Machinable Wax.

[Make Your Own Machinable Wax](#)

The Machinist Blog is one of the many sources for recipes for machinable wax that can be found via Google.

[Squishy Circuits](#)

The goal of The Squishy Circuits project is to design tools and activities, which allow kids, of all ages, to create circuits and explore electronics using, play dough.

[Kobakant](#)

The Kobakant Collective explores the use of textile crafts and electronics as a communication medium. Their [How to Get What You Want](#) page contains many links that should be interesting to the general experimenter.

[The Heath Robinson Rube Goldberg Computer](#)

This "work in progress" was named in honour of the illustrators, William Heath Robinson and Reuben Lucius Goldberg, who are famous for creating illustrations of incredibly complex machines that would perform relatively simple tasks.

[IC's? We Don't Need No Stinking IC's!](#)

Have a look at Dr. Harry Porter's DIY Relay Computer

[Building Complex Machines Using LEGO](#)

Following along these same lines, have a look at a couple of Andy Carol's LEGO creations:

- [Babbage Difference Engine](#)
- [Antikythera Eclipse Predictor](#)

[Antikythera Mechanism](#)

This YouTube presentation shows Michael Wright's working model of the [Antikythera Mechanism](#).

[A DIY CNC Router Table](#)

David Setya Atmaja describes his DIY Computer Numerical Control (CNC) system.

[Insearch Of The Perfect Kilogram](#)

Since the 1970s scientists have been working towards moving from a physical object to a kilogram based on fundamental constants of nature.

[DIY.org](#)

"[DIY](#) is a club for kids to learn skills. Makers share their work with the community and get patches for the Skills they earn. Each Skill consists of a set of Challenges that help them learn techniques to get the hang of it. Once a Maker completes a Challenge, they add photos and video to their Portfolio to show what they did."

[Airships: The Hindenburg and other Zeppelins](#)

This is Dan Grossman's site covering his interests in the Graf Zeppelin, Hindenburg, U.S. Navy Airships, and other Dirigibles

[Static Shocks in Supermarkets](#)

How many of you, like me, experience static shocks while filling your grocery order at the supermarket?

[Slides: A Playground Menace](#)

For thousands of hearing-impaired children, static, that may be generated as they go down playground slides, can shut down their cochlear implants in an instant.

[ESD Journal](#)

The previous two items were found on the ESD Journal. Check it out for other articles and information on ESD (Electro Static Discharge).

[Omnimatter](#)

Omnimatter is a haphazard mish-mash of geek, kitsch, science and philosophy.

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From Instructables, YouTube & Make:

[Instructables: Geo Data Logger](#)

This Arduino based prototype can be used to log, geo-tag, and time-stamp sensor data, which can then be analysed with mapping and data analyses software.

[Instructables: DIY BIO Printer](#)

This device shows you how to hack an old inkjet printer to allow you to print with biological materials.

[Instructables: Build a DIY Glove Box](#)

This DIY Anaerobic chamber was designed and built to grow cultures in a low oxygen atmosphere.

[YouTube: Random Weekend Projects](#)

Grant Thompson presents a collection of his “Random Weekend Projects”.

[YouTube: How to Make a Graphite Crucible](#)

See how to make a DIY Graphite Crucible.

[Make: A Urine Powered Generator](#)

Four Nigerian schoolgirls demonstrated their generator during a Maker Fair.

[Make: Science Archive](#)

Perhaps you can find an interesting science project buried in the Make: Science Archive.

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Random Samples:

Pepakura Designer

Pepakura Designer is a shareware program that allows you to create paper craft models from 3D data such as produced by [MetasequoiaLE](#) and many other 3D drawing packages.

J. S. Bach's Sinfonia to Cantata 35

I bet that Bach would have loved the potential of electronic music. He would have had [a ball!](#)

The Geek Atlas

128 places where science and technology come alive [Paperback] by John Graham-Cumming

The Scientific Traveler

A guide to the people, places, and institutions of Europe [Paperback] by Charles Tanford

Guidebook for the Scientific Traveler

For those visiting physics and chemistry sites across America [Paperback] by Dr. Duane Nickell.

Guidebook for the Scientific Traveler

For those visiting astronomy and space exploration sites across America [Paperback] by Dr. Duane Nickell.

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Suppliers and Stuff:

Smart Elements

Here is a source of high purity elements for periodic table displays, research or collecting.

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Ralph J. Coppola

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