

THE NEW WANDERINGS

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Feature:

I think that we can all agree that since its introduction, the Arduino micro controller has made quite a stir in the fields of Arts, Science and Technology. Therefore, this month I am presenting another *Feature* on the popular Arduino Microcontroller system.

[An Introduction to the Arduino](#)

The Arduino and clones are great, inexpensive microcontroller systems!

[An Arduino Course](#)

This collection of Arduino tutorials concentrates on the software side of Arduino work, inevitably, substantial information is also provided on hardware issues.

[Arduino "How To's", Goodies, and Projects](#)

This site is for those of you who are looking for write-ups of how to do specific things with an Arduino or for information on things you want to connect to your Arduino.

[Proto-DAC Shield for Arduino](#)

With 16 resistors you can build a simple digital-to-analog converter (DAC) that allows you to experiment and learn DACs do and how they do it.

[How-To: Shrinkify Your Arduino Projects](#)

Shrink your Arduino application to a single 8-pin package.

[Programming an ATtiny45 with an Arduino](#)

This tutorial shows you how to program an ATtiny45 or ATtiny85 microcontroller using the Arduino software and hardware.

[The Arduino Analog to Digital Converter](#)

This article demonstrates how to use the Arduino's onboard AtoD converter.

[Great 18-Bit ADC for GPS and Proto Shield Sensor Logging](#)

The Arduino's ADC is not suitable for many sensors like thermocouples or bridge sensing for pressure, strain, and force. Also it has fairly low dynamic impedance since it has no buffer amplifier.

[The Arduino Analog Input Pins](#)

Here is a description of the analog input pins on an Arduino chips (Atmega8, Atmega168, Atmega328, or Atmega1280).

[The World Famous Index of Arduino & Freeduino Knowledge](#)

This is an evolving index of practical subjects for the Arduino and Freeduino microcontrollers.

[Instructable: Arduino](#)

The Instructables editors have chosen some of their best DIY Arduino projects to educate and inspire you to make great things with easily available tools.

[Make: Arduino](#)

Arduino resources on the Make: web site.

[Arduino Rocket Launcher](#)

The author, feeling the need to create something needlessly complicated to short a battery across the ignitor of a rocket motor, turned to his Arduino Mega.

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Wanderings:

The Aurora Detector

This site shows how to build several devices that will detect the presence of the [Northern Lights or Aurora Borealis](#) by monitoring the earth's magnetic field

More Aurora Detectors

A simple DIY magnetometer may be used to detect the Aurora Borealis.

The OpenEEG Project

The OpenEEG project is a source of plans and software for DIY EEG devices.

Star Wars Science - Force Trainer

This “toy” uses [EEG technology to read your alpha and beta brain waves](#) to control the levitation of a ball. It’s a simple task to hack into the game and possibly control other tasks. See --- [Brain Control for the Arduino](#).

The Flat Earth Academy

The Flat Earth Academy is a website where any enterprising person can learn useful "stuff". The author’s background is in the sciences, so that is where the first and most extensive Good Stuff will be.

PAControl

This website is a source of free information relating to process control and automation. For example have a look at the free workbook --- [“Process Control Systems for Control of Temperature, Flow and Filling Level.”](#)

Anodizing Aluminum

On Frank J. Hoose’s “machine shop” site, he includes information and links for those who may be interested in anodizing aluminum.

An Open Source Pendulum Sensor Kit

An Arduino is used to calculate the pendulum’s period and the results are displayed on a graphic LCD or on a computer. The pendulum can be used to investigate the relation between the pendulum’s length or mass and period. The device can also be used as a gravity meter to determine acceleration due to gravity “g”.

The Magnet Man: Cool Experiments with Magnets

This web site is devoted to magnetism and the cool experiments you can do with permanent magnets and electro-magnets. He, also, includes the plans for a simple [DIY Gauss Meter](#).

[The Fundamentals of Electrostatic Discharge](#)

This tutorial should be useful to anyone working with electrostatic discharge devices ([Van de Graaff Generator](#)) or working with static sensitive electronic components or devices.

[An Earthquake Demonstration and Exploration Tool](#)

Kelsey Linton and Ross S. Stein at the [U.S. Geological Survey](#) demonstrate QuakeCaster, an earthquake teaching tool.

[The History of Malaria](#)

Malaria, a widespread and potentially lethal infectious disease, has afflicted people for much of human history.

[World's Smallest Motor: 1 Nanometre in Diameter](#)

Chemists at Tufts University have invented the world's smallest electric motor. I bet that [Richard Feynman](#) would have been very excited at this development in [nano-technology](#).

[Icecube Searches for Neutrinos](#)

The Icecube Telescope is a sub-atomic particle detector that is located at the South Pole. IceCube searches for neutrinos from the most violent astrophysical sources: events like exploding stars and gamma ray bursts.

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From Instructables, YouTube & Make:

[Instructable: A DIY 10 HP Hovercraft](#)

When you get tired of mowing your lawn, why not pull the motor from the mower and build a hovercraft?

[Instructable: Perpetual Motion Machine](#)

Who says that perpetual motion is impossible? Build this real-life version of M. C. Escher's Waterfall and prove them wrong ☺

[Instructables: LED Infinity Mirror](#)

I saw something like this in a hotel room in Italy. It was quite awesome.

[Instructables: How to Prepare an Electrophoresis Argarose Gel](#)

This Instructable illustrates the process of casting, loading, and processing an electrophoresis argarose gel, which is capable of separating biological molecules, based on size and weight by utilizing electricity.

[YouTube: The Rope Pump](#)

This is a design of a simple water pump.

[YouTube: 2000-Year-Old Computer Recreated](#)

This is a demonstration of the recreation of an ancient Greek analogue computer.

[YouTube: The Greek Antikythera Mechanism](#)

[Michael Wright](#) explains his reconstruction in greater detail.

[YouTube: Virtual Reconstruction of the Antikythera Mechanism](#)

To see just how much effort Michael Wright put into building his reconstruction have a look at this virtual model.

[YouTube: A Solar Powered, Magnetically Levitated Motor](#)

This would make a nice desktop conversation piece.

[Levitation Device](#)

These levitation toys have been available, commercially, for some time, but why not make your own?

[Make: Gyrocar](#)

Most of us have played with a toy gyroscope at one time or another. This clip will show you how to convert one into an ingenious gyrocar.

[Make: DIY Transistor from a CdS Photocell](#)

[Nyle Steiner](#) does it again!

[Make: DIY T.E.A. Ultraviolet Laser Made from Scrap Aluminum](#)

Here is another simple T.E.A. laser design.

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The Kids Room:

[Motion Mountain: The Free Physics Textbook](#)

This free Physics eBook consists of 6 pdf volumes (170 MB).

“These pdf’s tell, using hundreds of colour pictures and embedded films, about animals and sport (mechanics, gravity and heat), about the sky at night (relativity and the structure of the universe), about lightning, lasers and nerves (electricity, optics, the brain, language and truth), and about colours, pleasure and the stars (basic and advanced quantum physics, including nuclear physics and radioactivity).”

[Prepare for the Science Fair](#)

This animation, by Kevin Temmer, shows you how to prepare for a Science Fair.

[Donald-Duck-In-Mathmagic-Land Part 1/3](#)

Disney and Donald-Duck team up and explore the world of mathametics.

[Part 2/3](#)

[Part 3/3](#)

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Women in Science:

[Scientist in a Strange Land](#)

The September, 2011, issue of *Popular Science* had an article, *Scientist in a Strange Land*, about Felisa Wolfe-Simon and the backlash that surrounded her announcement that her research team had isolated bacteria that could subsist on arsenic in place of phosphorus. What was the reason for this controversy? Bad science? The media? Or what?

[Felisa Wolfe-Simon's Original Paper](#)

Here is Felisa's original paper as appeared in *Science*.

[Felisa Wolfe-Simon's Response](#)

This is Felisa Wolfe-Simon's response to concerns regarding her discovery.

[Felisa Wolfe-Simon's CV](#)

You can view Felisa Wolfe-Simon's CV and Publications on line.

[Further Reading](#)

You can view other articles, about this subject, at *Science*.

Random Samples:

[The Barefoot College](#)

The Barefoot College was founded in 1972 by Bunker Roy. The College is a place where "Rural men and women irrespective of age, who are barely literate or not at all, and have no hope of getting even the lowest government job, are being trained to work as day and night school

teachers, doctors, midwives, dentists, health workers, *balsevikas*, solar engineers, solar cooker engineers, water drillers, hand pump mechanics, architects, artisans, designers, masons, communicators, water testers, phone operators, blacksmiths, carpenters, computer instructors, accountants and *kabaad-se-jugaad* professionals”.

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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.

Newton

The Newton software package provides a completely new way of learning and teaching physics. Build, manipulate or investigate real-life 3D physics experiments interactively and solve problems.

Ford Model “T” Spark Coil

Induction coils, of one form or another, were once standard equipment in any well equipped science laboratory. Do you have one? I do!

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On The Lighter Side:

How to Rise Baby Praying Mantis

This item brought back memories. Long, long ago when I was about 9 +/- years old I found a bunch of **strange things** attached to some branches. I did not know what they were but being inquisitive; I collected a bunch to bring home. I then put them on the back porch and quickly forgot about them. Some time later I went out to the porch and to my surprise there were thousands of tiny baby Praying Mantis all over the place! I can't remember what happened next but I can still picture that horde of little critters ☺

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From The Far Side:

[Space Energy Test? \(2-23-1994\)](#)

This is an excellent example of how a person, who has no understanding of “first year” DC theory, can come up with an outrageous explanation of how things work.

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