THE LEADING EDGE

The Newsletter of the Northern Illinois Rocketry Association Jan/Feb 2008

MODEL OF THE YEAR WINNERS

Congratulations to Katie Mitchell, Marc Mitchell, and Angel Cooper

Katie Copter NIRA Loft

Echostar

THE LEADING EDGE

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The Leading Edge is published bi-monthly for members of the Northern Illinois Rocketry Association (NIRA) NAR Section#117
Dedicated to the idea that rocketry is fun!

Contributors this issue;

Articles	Marty Schrader
Photographs	Rick Gaff, Tony Lentini, Bob Kaplow

T Minus One

Launch Windows

NIRA

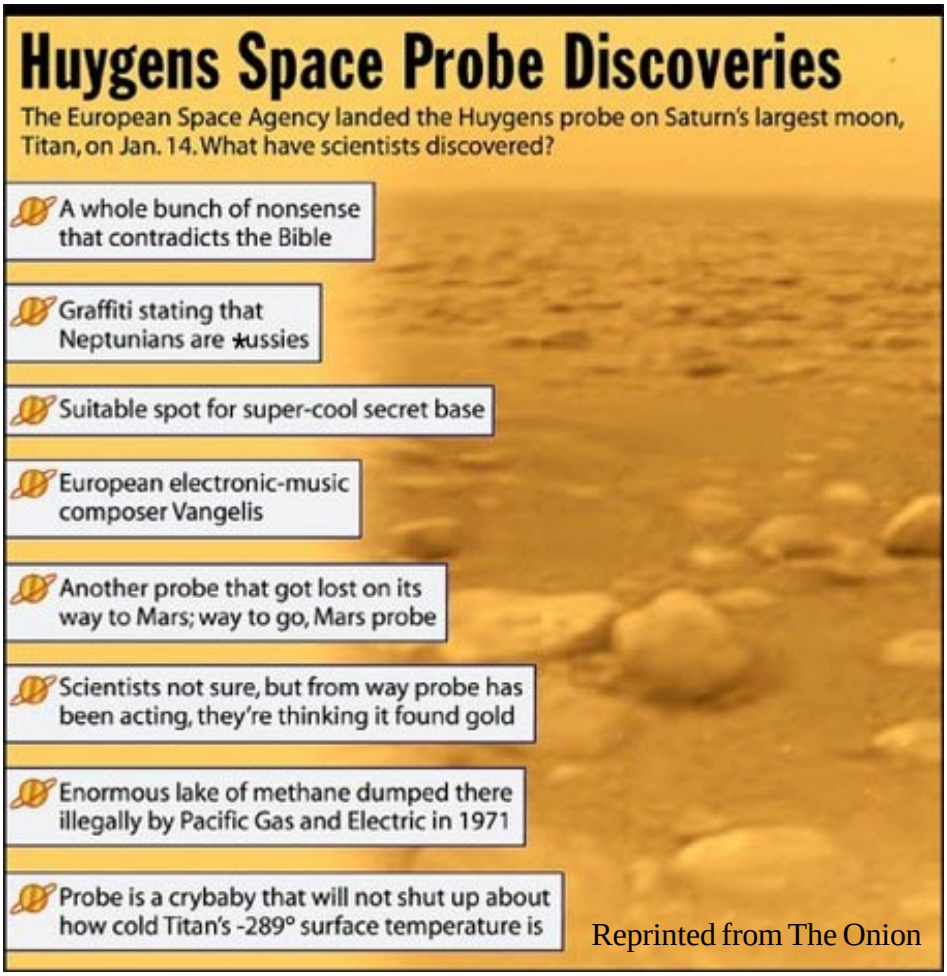
Apr 20	East Branch Forest Preserve
May 18	East Branch Forest Preserve
June 15	East Branch Forest Preserve
July 20	East Branch Forest Preserve
Aug 17	East Branch Forest Preserve
Sep 21	East Branch Forest Preserve

Meeting Calendar

NIRA ***We are now back to our schedule of first Friday of the month.***

Mar 7	Monthly meeting Helen Plum Library
Apr 4	Monthly meeting Helen Plum Library
May 2	Monthly meeting Helen Plum Library
June 6	Monthly meeting Helen Plum Library

Last January marked the one year anniversary of the Huygens Space Probe landing on Titan. Let's see some of it's accomplishments.



Reprinted from The Onion

Model Of The Month

January Winners

Adult honors were split between **Marty Schrader** with his unfinished **Water Boy** and **Marc Mitchell** with his ultra-slick **Shadow Cruiser**.

Youth went to **Jon Mitchell** with his **Fat Cat**, a Fat Boy decorated in custom Garfield imagery.

February Winners

Adult honors went to **Marc Mitchell** for his **Advanced Rocketry Corporation 2418PSR 'Chief'.**

Youth went to **Katie** for her **Estes Sizzler 'Starfire'.**

An Anti-Zipper Nose Cap for Your Rocket

Marty Schrader, NIRA Technical Support

Rockets that use thin shock cord leads or leads anchored deep in the airframe are subject to zippers. Here's how to avoid such a situation.

If you have a rocket that uses a wire or thin Kevlar shock cord lead then you might catch a zipper in your airframe. That's bad news. Or perhaps you had a particularly long delay and jerked the shock cord a little too hard. You might even have had too short a delay and popped the nose cone early. There are any number of reasons why you might catch damage to the upper end of your rocket's airframe.

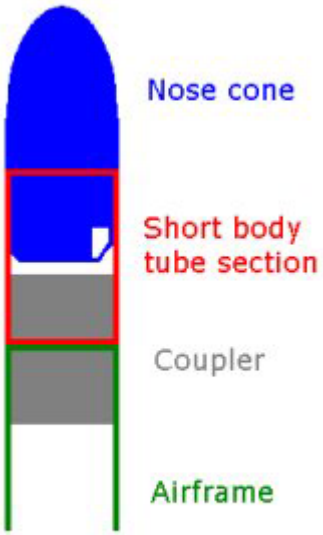


Figure A
Generic nose cap

A nose cap can greatly reduce the risk of zipper and add strength and rigidity to the upper end of your rocket's airframe. The typical nose cap configuration (Figure A) uses a thick-walled coupler fixed to the airframe and a short section of body tube fixed to the shoulder of the nose cone. The short section of body tube slides over the coupler and butts up against the end of the airframe.

[Note: It should be pretty apparent from the drawing that this configuration doesn't work with a piston, since the coupler is affixed to the upper end of the airframe. There are schemes to make an extended piston act as the coupler, but such schemes are outside the scope of this article.]

Even though this arrangement is as simple as it appears there are certain considerations one needs to take into account before hacking up one's rocket. Is the overall length important? You may need to do some careful measuring and cutting. Is the shock cord anchor going to interfere with the coupler? The anchor may need to be relocated. Is the coupler too tight for free movement? Sand, sand, sand.

To start with, if this is a repair or a retrofit then the location of the shock cord anchor could be a problem. If the shock cord is anchored far down inside the airframe then you can continue. If the anchor is up towards the top of the airframe then you'll need to pull out the anchor and relocate it after you cut the airframe.

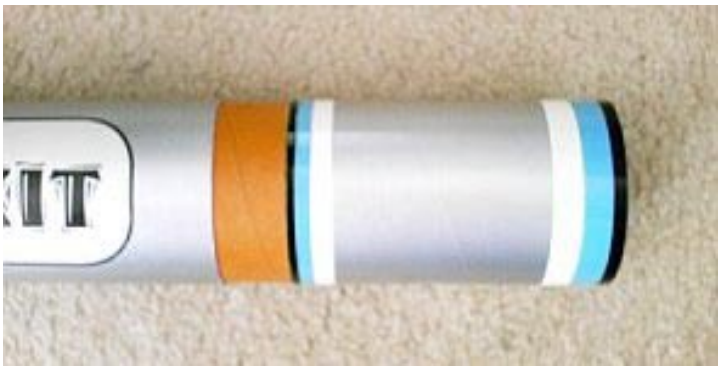
If this is a new rocket then consider mounting the shock cord anchor on the upper bulkhead of the engine mount. Most HPR designs call for this kind of attachment. It's not a bad idea even for mid and model level heat, too.

You'll need a coupler that is long enough to provide adequate support for the nose cap. There really isn't any science to suggest exactly how long that is, but the general rule is longer is better. At a minimum the coupler should extend a minimum of one caliber into both the nose cap skirt and the airframe.

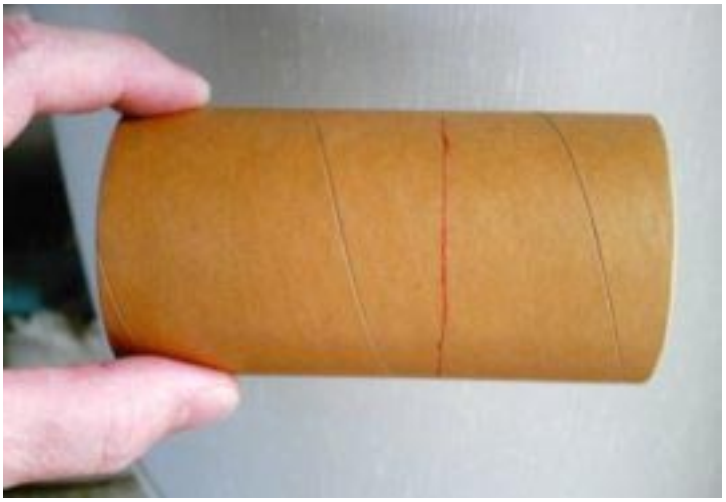
The length of the nose cap skirt is also a matter of Kentucky windage. At a minimum the skirt must be long enough to prevent the coupler from hitting the back of the nose cone. After that it is a matter of feel for how long it needs to be.

If your nose cap skirt is long enough to prevent easy access to the shock cord attachment point of the nose cone then you need to attach a shock cord lead to the nose cone before assembling the nose cap. For mid and model level nose caps try using a short piece of nylon string with a split ring at the free end to act as an anchor and attachment point.

You can also try cutting out the entire back side of plastic nose cones to make a completely hollow nose cap. This works particularly well for short rockets that need a lot of parachute or streamer. Set the length of the nose cap lead to be



longer than that of the parachute so that the chute will be pulled from the nose cap during deployment, thus assuring that the chute is exposed to the air. With a hollow nose cone



at the end of your nose cap you can stick a big parachute in there and still get the thing configured for flight.

Try to place the seam for the nose cap where you have a black accent ring or similar dark accent. That way the bottom of the nose cap, the top of the airframe, and the area of the coupler just above the end of the airframe can all be made black. The seam will be less visible that way.

Installing your nose cap is straightforward:

Round off the inner and outer edges of the coupler at the top. For the bottom you need to round the inner edge to make sure the parachute slides out easily and won't hang up on the edge of the coupler.

Mark the coupler at the insertion depth.

Apply glue to the inside of the airframe near the top and spread it around.

Using a smooth, continuous motion, insert the coupler to the mark, turning the coupler on its longitudinal axis as you insert it.

Once the glue is cured you now have a stiffened and zipper proof upper end to your airframe. Attach the shock cord to the node cap lead and away you go.

VIRGIN UNVEILS NEW SPACESHIP

Virgin Galactic, the space tourism venture run by Richard Branson, unveiled its new commercial sub-orbital spacecraft, the SpaceShip Two. Here are some of the features that can be found on the vessel:

Souvenir space helmets that emulate the look of Richard Branson's hair.

Complimentary Yukon Gold potato chips.

Everything an airplane has but with the word "space" in front of it.

Ticker reading Branson's current net worth.

Deluxe Tempur-Pedic mattresses, the space-age foam developed by NASA.

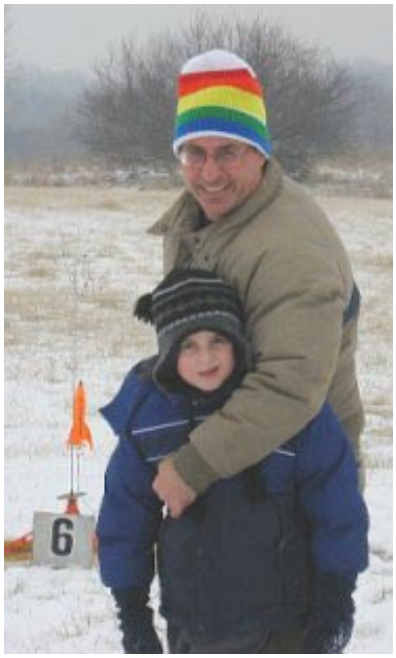
A "What To Do If You Accidentally Get Shot Into Space" safety video.

Reprinted from The Onion

January Polar Bear Launch

Or should that be Polar BRRR...

A bunch of the less inhibited members went out to brave the elements for a launch in January.

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NIRACON

Norm Dziedzic gives a demonstration on the workings of Rocksim.

Norm contemplates the potential aerodynamic properties of a half-full bottle of Dasani.

Norm checks his center of gravity.

Rocksim lacks one important feature; you have to provide your own sound effects during the simulated flight.

During the Q&A session, Tony explains that he constructed his Centuri Point in Rocksim, and got much better results in simulation than the actual flight.

Rick Gaff handles the NIRA Auction. 'This one's mine.'

The kids are kept busy with a 'Make It & Take It' session.

Alternate uses for rocket stands.

"If it doesn't look like the picture that's OK, isn't it?

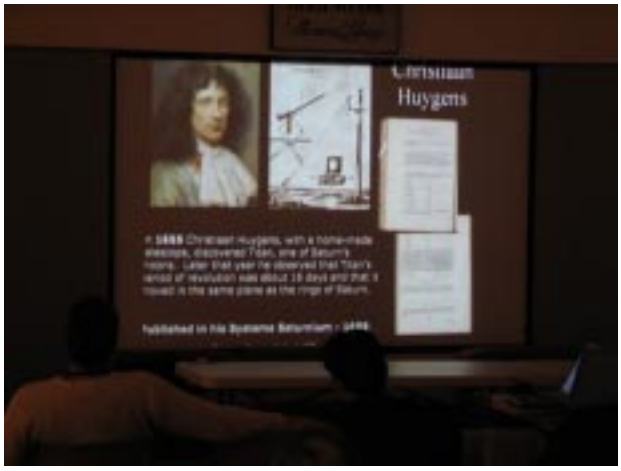
More fun than playing Nintendo.

The instructions are easy enough for a young child to understand.
Fortunately there were plenty around to explain things to the adults.

NIRACON

Bob introduces **John Vittallo** - Solar System Ambassador for the Jet Propulsion Lab.

John Vittallo - begins his talk.



John's presentation discussed the ongoing Cassini mission For the Huygens' accomplishments, see page 2.

Bob Kaplow's presented a talk on getting into High Power Rocketry

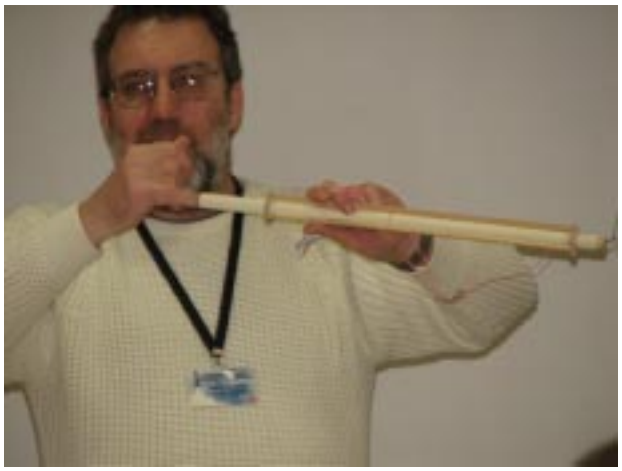
Bigger body tubes need bigger fins.

Bob explains that old AOL CD's don't make very good centering rings.

Adam Elliott demonstrates the components of a typical egg lofter including...

A parachute made from Jane Fonda's old Barbarella costume.

Marty Schrader gives a talk on Boost Gliders. "This part is called 'The Wing'".



Marty demonstrates how to get your finger stuck in an internal pop pod.

"After rolling in on his six, you're in good firing position."

Most important tip: 'This end up."

All The News That Fits To Print

Mars Rover Beginning To Hate Mars

Unmanned Vehicle 'Bored Out Of Its Mind'

PASADENA, CA—NASA Jet Propulsion Laboratory scientists overseeing the ongoing Mars Exploration Rover Mission said Monday that the Spirit's latest transmissions could indicate a growing resentment of the Red Planet.

"Spirit has been displaying some anomalous behavior," said Project Manager John Callas, who noted the rover's unsuccessful attempts to flip itself over and otherwise damage its scientific instruments. "And the thousand or so daily messages of 'STILL NO WATER' really point to a crisis of purpose."

The "robot geologist," as NASA describes Spirit, has been operating independently for over 990 Martian sols—nearly the equivalent of three Earth years. However, scientists estimate that, in recent weeks, Spirit has been functioning on the level of a rover who has been on Mars for approximately 6,160 sols.

According to Callas, Spirit was operating normally until the onset of the Martian winter, whose shorter days and frigid temperatures typically mean a slower pace for exploratory rovers. "We began getting the occasional transmission along the lines of 'ANOTHER SOIL SAMPLE OF THE EXACT SAME COMPOSITION AS THE LAST ONE,'" Callas said. "Most of the time, she'd power down and not transmit much of anything, which, at the time, didn't particularly concern us."

But as the winter lingered, Spirit began producing thousands of pages of sometimes rambling and dubious data, ranging from complaints that the Martian surface was made up almost entirely of the same basalt, to long-winded rants questioning the exorbitant cost and scientific relevance of the mission.

Project leaders receive data from the mars rover Spirit. "Granted, Spirit has been extraordinarily useful to our work," Callas said. "Last week, however, we received three straight days of images of the same rock with the message 'HAPPY NOW?'"

Mission Project Scientist Bruce Banerdt said that Spirit will often roll down Gusev crater and up the opposite side for no apparent reason, missing "countless" potential opportunities for scientific discovery.

"Once, when we radioed her to please leave the lecturing and hypothesis-making to the mission project team, she responded by forming her robotic arm into an obscene gesture," Banerdt said. "That arm contains a state-of-the-art spectrometer meant to provide crucial mineralogy data."

Project organizers said the most distressing instance of erratic behavior occurred last week, when images from the Mars Reconnaissance Orbiter revealed that Spirit had scrawled the message 'F*** MARS' in the thick, iron oxide dust that gives the planet its characteristic red color.

"The orbiting Mars Odyssey has cut off transmissions from Spirit, which seems to envy the craft's ability to fly freely around in space," Banerdt said. "Similarly, data suggests Spirit is convinced that [sister rover] Opportunity has found water and isn't telling anyone."

Despite these malfunctions, mission leaders remain optimistic that the rover will eventually return to full working order.

"Hopefully these malfunctions will straighten themselves out," Callas said. "In the meantime, we'll simply have to try to glean what usable data we can from 'OVERPRICED SPACE-ROOMBA WAITING FOR MORE STUPID ORDERS.'"

NASA remains optimistic that the rover will remain at least partially operational for the foreseeable future. However, because of the Spirit's recent proclivity toward ramming into boulders at full speed, scientists have remotely disabled its 1.5-pound rock-abrasion tool so the rover is unable to terminate the mission prematurely.

Reprinted from The Onion