



# T.H.O.R.

## The Heartland Organization of Rocketry

### THOR's Hammer

The official newsletter of The Heartland Organization of Rocketry!

#### Contents

May/June Calendar – Page 2

ATF Ruling – Page 3

AeroTech sold to RCS – Page 3

Pickrell HPR Launch – Page 4

Shockwave – Page 8

La Vista Sport Launch – Page 10

Aerospike – Page 12

NASA's Space Place – Page 14

Meeting Minutes – Page 15

May/June 2004

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Volume 11 Number 3



Joe Michel and his Shockwave after his successful Level 2 flight. (Richard Burney)

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## Internet Links of Interest

<http://www.nerocketry.org/>  
THOR's official web page. Has information on our club, launch dates, and history.

<http://spaceplace.jpl.nasa.gov/index.shtml>  
Home page for NASA's Space Place program of which THOR currently participates in.

<http://www.tripoli.org/>  
Home page for the Tripoli Rocketry Association.

<http://www.nar.org/index.html>  
Home page for the National Association of Rocketry.

<http://www.rocketryonline.com/index.cgi>  
An excellent source of model and high power rocketry related news and information.

<http://www.giantleaprocketry.com/>  
Giant Leap Rocketry has been THOR's main vendor at our high power launches for several years.

<http://www.kloubusters.org/>  
Home page for the K.L.O.U.D.Busters Tripoli Prefecture of the state of Kansas.

## May/June 2004 Calendar

### May

**Event:** Fire on the Farm VII.  
**When:** Experimental day on Friday April 30<sup>th</sup>. High power commercial flying on Saturday May the 1<sup>st</sup> and Sunday the 2<sup>nd</sup>, 9:00 AM to 5:00 PM each day.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** TBA.  
**Description:** THOR's annual three-day, high power, spring launch.  
**For More Information:** Final details will be set by the April meeting.

**Event:** May Meeting.  
**When:** Tuesday the 4<sup>th</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 16<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** High Power Launch.  
**When:** Saturday the 22<sup>nd</sup>, 9:00 AM to 5:00 PM.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** \$5.  
**Description:** High power and low power sport flying.  
**For More Information:** Check the rocketry hotline for any delays or cancellations if weather looks questionable.

**Event:** National Sport Launch.  
**When:** Friday the 29<sup>th</sup> through Monday the 31<sup>st</sup>.  
**Where:** McGregor, TX.  
**Description:** NAR's annual sport launch.  
**For more information:** <http://aarg.org/nsl/nsl.html>

### June

**Event:** June Meeting.  
**When:** Tuesday the 1<sup>st</sup>, 7:00 to 10:00 PM.  
**Where:** La Vista Community Center.

**Event:** Low Power Launch.  
**When:** Sunday the 6<sup>th</sup>, Noon to ?  
**Where:** La Vista Sports Complex.  
**Fee:** Free.  
**Description:** Low power sport flying.

**Event:** Nebraska Heat VII.  
**When:** Experimental day on Friday the 18<sup>th</sup>. High power commercial flying on Saturday the 19<sup>th</sup> and Sunday the 20<sup>th</sup>, 9:00 AM to 5:00 PM each day.  
**Where:** Pickrell, NE.  
**Ceiling:** 15,000' MSL (13,650' AGL).  
**Fee:** TBA.  
**Description:** THOR's annual three-day, high power, summer launch.  
**For More Information:** Final details will be set by the June meeting.

## Joint Statement on Court Hearing and Order Clarification

Reprinted from [www.tripoli.org](http://www.tripoli.org)

Hobby rocketry received some major relief from the U.S. District Court in Washington, DC, last Thursday.

On April 22, 2004, Judge Reggie Walton agreed with NAR/TRA's interpretation of his recent order our court case. Judge Walton said that the 1994 Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE) exemption granted to hobby rockets as "propellant actuated devices" (PADs) remains valid.

This means that unless and until BATFE properly promulgates a rule rescinding the 1994 PADs exemption, fully assembled rocket motors (regardless of weight) are propellant actuated devices under the law and are exempt from regulation by BATFE.

We are free to fly, at least for the time being.

Judge Walton further said that if BATFE agents take any enforcement action in the field that are not consistent with this ruling, NAR and TRA should come back to his court immediately and seek an injunction against BATFE.

BATFE has already said they intend to promulgate a rule rescinding the PADs exemption, and that they believe they can have it completed by December 2004. Their recent undertaking with regard to rulemaking on the 62.5 grams issue would suggest otherwise with regard to their ability to complete a rulemaking in a timely fashion.

The hearing before Judge Walton in Washington was a status hearing reviewing his March 19, 2004 order in our case. NAR/TRA Counsel Joe Egan and Marty Malsch sought clarification about the PADs portion of Judge Walton's ruling in response to member reports of BATFE agents insisting that the PAD exemption did not exist for rocket motors.

Judge Walton told NAR/TRA and BATFE to reach agreement on the specific questions raised by our lawyers, and Joe Egan sent a letter explaining the NAR/TRA position to BATFE on Friday, April 23. The text of the letter can be viewed here: <http://www.tripoli.org/documents/batfe/batfe-letter20040423.pdf>

We suggest that members keep a printed copy of this letter with them any time you are engaged in rocketry activities and if a BATFE agent, who may not be fully aware of Judge Walton's decision, raises this issue, show them the letter and suggest that they contact your legal counsel.

Members who either are threatened or receive enforcement action should immediately contact NAR President Mark Bundick via email or at 630-293-9343 or TRA President Dick Embry via email or at 520-241-1582 and provide full details of those action or threats. NAR/TRA counsel will then seek the appropriate relief from Judge Walton's court.

NAR and TRA board members are actively monitoring the Federal Register and will notify the full membership if and when BATFE issues a "Proposed Notice of Rulemaking" on the PADs issue. Members who wish to monitor the Federal Register on their own may visit <http://listserv.access.gpo.gov/>, and sign up to receive daily notices. Members who instead wish to periodically view

BATFE rule making underway can visit <http://www.atf.gov/firearms/rules/index.htm#proposed> to see outstanding and historical rule making activities from BATFE.

Finally, Judge Walton scheduled his next status hearing for December 19, 2004, to review any BATFE progress on rule making.

We encourage members to turn their attention back to the flying field to enjoy the safe, educational and fun sport rocketry hobby, and spend less time worrying about BATFE enforcement action.

Our counsel continues to provide outstanding legal advice and support to our cause. Our thanks to Joe Egan and Marty Malsch for their extensive legal preparation and for the hospitality in welcoming us to Washington, DC.

As always, we appreciate the comments, input and support of NAR and TRA members in this fight. And, as our case proceeds, we will continue to need your financial support to build on this victory. We urge you to make a donation to the Legal Defense Fund today, in whatever amount you possibly can contribute. Your support and generosity will be recognized and acknowledged, and you'll be able to say "I supported the fight for an unregulated sport rocket hobby."

As we have further developments, we'll report them here and in our publications, as soon as possible.

*Dick Embry, President  
Tripoli Rocketry Association*

*Mark Bundick, President  
National Association of Rocketry*

## RCS Purchases Assets of AeroTech, Inc. and ISP, Inc.

Courtesy of Rocketry Online –  
[www.rocketryonline.com](http://www.rocketryonline.com)

RCS Rocket Motor Components (RCS), Inc. is pleased to announce that it has purchased the intellectual and physical assets of AeroTech, Inc. and Industrial Solid Propulsion (ISP), Inc. at an auction held in U.S. Bankruptcy court in Las Vegas on April 2, 2004.

After the closing of the sale no later than April 19, 2004, the AeroTech and ISP corporate shells will be liquidated and all future AeroTech and ISP business will be transacted through RCS. RCS will market the existing AeroTech and ISP product lines under the "AeroTech Consumer Aerospace", "Econojet", "Industrial Solid Propulsion" and "ISP" trade names.

RCS plans to continue the manufacturing and shipment of AeroTech and ISP products with no interruption. Additional employees are being hired and production rates will be accelerated to help provide for increased product demand anticipated during the 2004 flying season.

All company phone numbers, websites and email addresses will remain the same for the time being. ✦

## THOR High Power Launch Pickrell, NE – March 20<sup>th</sup>

Article by Richard Burney

Pictures by Richard Burney, Matt Jones, Jason Vennard, and Mark Smith

After having a nearly perfect string of high power launches for the 2003 season, the 2004 season started off quite windy! The wind was constantly blowing from the north at about 15 MPH with gusts well above 20 MPH. On the positive side, it was mostly sunny with a high in the 50's.

Due to the less than perfect conditions, only 21 flights were conducted by 14 flyers. One of those flights was a successful Level 2 Certification flight by Joe Michel (*see next article*). The motors burned in each class were as follows: **A – 1, C – 2, D – 1, E – 1, F – 1, G – 5, H – 6, I – 2, J – 2.**

Though there wasn't much in the way of flying, the day was quite eventful! Jason Vennard's Level 2 flight using a BSD THOR came to a quick end when the J350 motor along with its adaptor flew right up through the rocket, flew about 50 feet up into the air, and then shot right into the ground just feet away from the LCO's table and a few spectators. Fortunately, no one was hurt and the only damage was to Jason's rocket. For those who stuck around until the end, the last flight of the day was a flying saucer type rocket powered by a Pro38 G69. The saucer landed in the nearby weeds sparking off a large brush fire even the motor had **NO** ejection charge in it. Due to the dry conditions and the strong northern winds, the fire traveled all the way down to the road in a few minutes even consuming part of the tree that has been a landmark on our site for years. Fortunately, the fire did not carry across. The Beatrice volunteer fire department arrived in about 20 minutes and were able to bring the remainder of the fire under control. Again, no one was hurt, the fire fighters were actually glad that they were able to get out to do something during an otherwise boring day, and some of those pesty weeds were disposed of!

And I thought that Fire on the Farm was next month!

A special thanks to Kent Burnett (Giant Leap) and Matt Jones (Flyfast Industries) for providing their vendor services. ✦



Thomas Kernes and his original *Big Roy* configured for dual-stage deployment. (Burney)



Liftoff on a Pro38 I205. *Big Roy's* main parachute deployed at low altitude as planned. (Smith)



**Mark Smith and his Estes V-2. (Smith)**



**Skip Legge and an AeroTech Mustang. A rare appearance by Skip! (Smith)**



**Mark's V-2 at the moment of ignition on a D12-3. The small motor combined with the winds resulted in a cruise missile flight trajectory. (Smith)**



**Liftoff on an E15-7. (Smith)**



Jason Vennard preps his BSD Thor for his Level 2 attempt. (Burney)



In less than a second, the motor was about 50 feet in the air before shooting into the ground. (Vennard)



Within a fraction of a second of ignition, the J350 and its motor adaptor punched its way up through the rocket. (Jones)



Jason picks up the motor and adaptor shortly after driving itself into the ground. (Burney)



Some of the burn damage caused by the J350. (Burney)



Jeff Moon and his *Moon Dart*. This was Jeff's attempt to recertify Level 1. (Burney)



Don Rice and his *Super Snitch*. (Burney)



Liftoff on a Pro38 H153. Due to a broken fin unit upon landing, Jeff will have to try again. (Burney)



Liftoff on a Pro38 G69. Don later flew this on a Pro38 H153... Don's *Snitch* DID NOT start the fire! (Burney)



I thought FOTF VII was next month! Though it looked bad, by a month after the fire, new vegetation had sprouted out! (Burney)

## Joe Michel's Shockwave

Article taken from Joe Michel's webpage  
(<http://home.alltel.net/jm44316/>)

Pictures by Joe Michel and Richard Burney

### Design...

I decided to go for Level 2 certification about 2 seconds after I certified Level 1. This of course would require a new rocket. I wanted to build a really big rocket with dual deployment. I also wanted the ability to fly it on a J-class Hybrid if I wanted too. With those requirements in mind, I set to the task at hand.

I looked seriously at two rocket kits for this project. One was the BSD THOR, and the other was the PML Endeavor. Both kits built stock would make fine certification rockets. However, neither kit offered exactly what I wanted and would require modification. So in the end I decided to scratch build.

What I settled in was basically a 4" upscale of the Aerotech Arreaux. It was not my intention to build and upscale of the Arreaux. I really like the Arreaux-style fin, and the overall dimensions were about right for what I looking for, so I used the Arreaux as a guide. Like before with my Der Red Max, I used DeltaCad to design the rocket.

### Parts...

I wanted to use G-10 fiberglass fins on this rocket. I have used them on some of my mid-power rockets, and really liked them. They are not super light, but they are very strong, and don't warp like wood. They also don't require reinforcing or filling like wood. Red Arrow Hobbies made a set of custom .093" G-10 fins to my specifications for this project. This was actually cheaper than buying the raw material and cutting it myself! You can't beat that! Other parts included 48" section of PML Quantum Tube, PML 54MM motor tube and centering rings. The necessary couplers and bulkheads for the electronics bay were also from PML. The rocket will fly with a Missile Works RRC2 dual-deployment altimeter. This project as of yet is not complete; though I anticipate finishing it up in the next month or two. A name and color scheme for the rocket is yet undecided.

### Electronics Bay...

I designed the Electronics bay to be as easy to work with as possible. I built the bay with the following parts:

- 1 standard PML 4" coupler
- 2 PML 4" bulkheads
- 2 PML 4" coupler bulkheads (fit inside coupler)
- 1 8.5" length of ¼ by 20 threaded rod
- 2 "U" bolts
- 2 ¾" PVC pipe endcaps
- 1 115V/220V selector switch cobbled from old computer power supply

The bulkheads and coupler bulkheads were glued together to form a cap for each end of the bay. I wired permanent e-match terminals in to each end cap as well. Each end cap also has one u-bolt for the recovery harness, and one ¾" PVC end cap to hold black powder

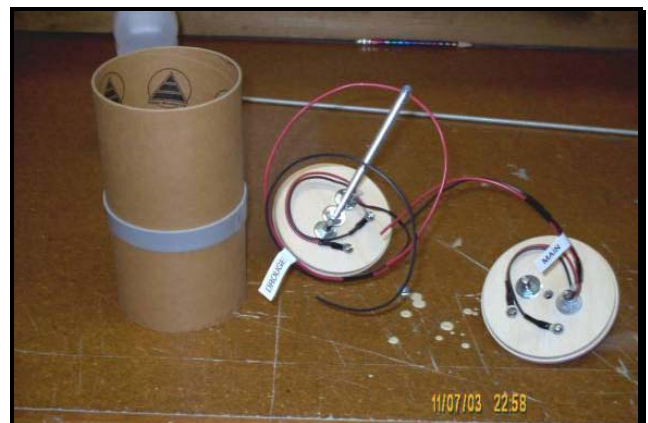
charges. A short ring of body tube is permanently affixed near the center of the bay to house and on/off switch for the altimeter. I chose the computer power supply switch for rocketry use because of its high detent forces.

The altimeter mount is made from a piece of G-10 Fiberglass, and a chunk of ½ copper pipe. The mount slides over the center stud inside the bay, and is locked in place with a washer and ¼-20 nut. When the drogue end of the bay was completed, a thin skin of 30-minute epoxy was poured in to completely seal that end of the bay. This is necessary to eliminate the possibility of pressure from the drogue charge freaking out the altimeter. The main side of the bay is not sealed to permit access inside.

### Flight...

After slowly building Shockwave most of the winter, flight day finally arrived on March 20th, 2004. I arrived at the launch, and rounded up a few friends to be my certification team. After acing the written L2 test, I began careful prep of the dual deployment recovery system. This flight would have a PML streamer deploying at apogee with motor backup, and main deployment at 500ft. Drogue and main harnesses are both 25ft in length. After the recovery system was buttoned up, I turned attention to loading the motor. This flight would be on a CTI 3-grain Pro54 J-295 motor. Once the motor was loaded and installed, we took a few pictures and headed to the pad. The day turned out to be a real bummer weather-wise, with strong 20MPH winds. With the help of my test proctor and a friend, Shockwave was put on the pad, and the igniter installed. I armed the electronics, verified the RRC2 was beeping right, and headed back to the LCO table.

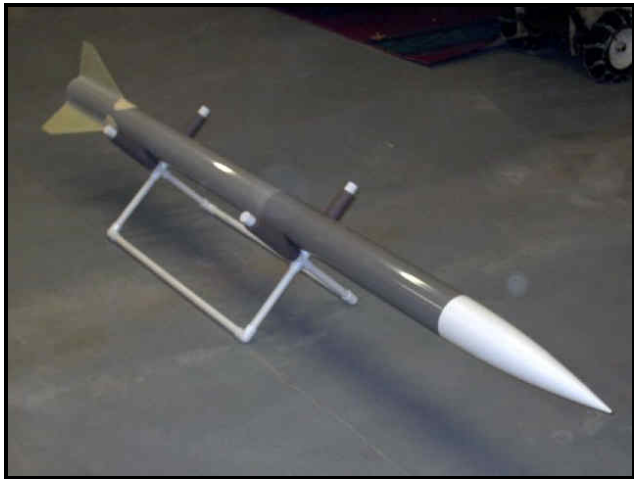
Considering the strong wind, and the fact that my friend's L2 attempt earlier in the day was a spectacular failure, I was getting nervous at this point. Countdown commences, and I cross my fingers! The LCO pushes the button....nothing. Try again, nothing. After fiddling with some wires on the launch controller, the LCO tries again. Finally, the big J-295 awakens with a thunderous roar, and Shockwave is on its way! The rocket had a very straight accent considering the strong winds. The streamer deployed right on queue, and the decent began. After falling for what seemed like an eternity, the main chute deployed, and Shockwave had a gentle touchdown about ½ mile away. Upon recovery, the rocket had no damage except for a few scuffs on the paint. The RRC2 was beeping out 4,686ft. A successful flight and Level 2 certification! ✨



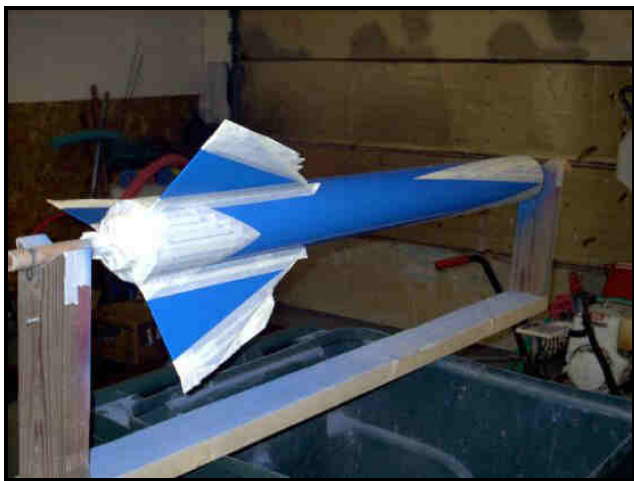
Shockwave's altimeter bay. (Michel)



The mostly finished fin canister. (Michel)



A mostly complete Shockwave. (Michel)



Shockwave is masked and readied for the silver parts of its paint job. (Michel)



Joe stands ready with the final product. (Burney)



Liftoff on a Pro54 J295. Shockwave reached an altitude of 4,686'. Even with dual-stage deployment, it landed nearly half-a-mile away. Congratulations, Joe! (Burney)

## THOR Sport Launch La Vista, NE – April 4<sup>th</sup>

Article and pictures by Richard Burney

While the March 20<sup>th</sup> high power launch was a pretty windy day, fortunately the April sport launch was a much more pleasant day. The winds were mainly out of the west at about 5 MPH, the day was mostly sunny, and the high was in the upper 50's. Not bad for early April!

Besides being a sport launch for THOR members, many of the flyers out at the field this day were Cub Scouts of Pak 396 along with their families. For about two hours, a model rocket was going off every two minutes or so; too bad we didn't use flight cards to track just how many flights were accomplished!

A special thanks to the Scouts of Pak 396 and their families for making this a great day of flying. ✦



Eric Kopiasz and his *Flaming Death*.



An unidentified Big Bertha sails off the pad.



Liftoff on a D12-3. Unfortunately, *Flaming* ended up in the nearby power lines.



Left to right, Cub Scouts Ryan Regan and Spencer Lear with a Quest Big Betty.



Cub Scout Jimmy Meyers and his rocket.



Liftoff!



Liftoff on a B6-4.

## Aerospike Engine Flight Test Successful

*Reprinted from [www.dfrc.nasa.gov](http://www.dfrc.nasa.gov)*

NASA's Dryden Flight Research Center, the U.S. Air Force Flight Test Center (AFFTC), and Blacksky Corporation joined forces on the prairie lands of West Texas recently to fly small aerospike rocket nozzles.

The effort, called the Dryden Aerospike Rocket Test, yielded big returns, providing the first known data from a solid-fueled aerospike rocket in flight.

Two 10-ft. long solid-fueled rockets with aerospike nozzles were flown successfully on two consecutive flights March 30 and 31, 2004. Under perfect skies and calm winds, the rockets ascended from the King Ranch launch site at the Pecos County Aerospace Development Corporation Flight Test Range in Fort Stockton, Texas.

"The success of the Dryden Aerospike Rocket Test project opens up a whole new way of obtaining flight research data for not only the aerospike nozzles but for other rocket technologies as well, such as dual-bell nozzles," said NASA Dryden's Trong Bui, the project's principal investigator. "This inexpensive, high-speed flight research platform allows us to take new ideas to flight quickly and at the same time, increases the technology readiness level of new aerospace concepts," Bui said.

Aerospike nozzles can be thought of as inside-out rocket nozzles. Rather than the rocket engine's exhaust plume exiting out the traditional bell-shaped nozzle, the plume travels externally. The main advantage of aerospike nozzles is that, as the rocket climbs, atmospheric and airstream pressure act on the plume to keep it at an optimum setting along the entire trajectory. This allows very efficient engine performance in flight. With traditional rocket engines, the bell nozzle is most efficient at only one point in the rocket's trajectory.

Although the advantages of the aerospike nozzles are well understood through analysis and ground test data, the lack of actual flight test data has precluded use of these nozzles in current as well as next generation space launch vehicles. In addition, the configuration of an aerospike nozzle presents unique challenges to the designer and fabricator.

The rockets reached supersonic speeds in excess of Mach 1.5 and peak altitudes of over 26,000 ft. However, speed and altitude weren't the

project's aim. The goals of this flight research project were to obtain aerospike rocket nozzle performance data in flight and to investigate the effects of transonic flow and transient rocket flight conditions on aerospike nozzle performance.

"The successful planning and integration of the Dryden Aerospike Rocket Test project clearly demonstrates the capability of the low-cost technology approach used," said Scott Bartel of Blacksky Corp., of Carlsbad, Calif., which built the rockets. "The flight operations support from the Tripoli Rocketry Association and Fort Stockton shows that enthusiasm for aerospace research is universal," Bartel said.

Blacksky Corp. coordinated development of the experimental aerospike nozzles and solid propellant motors used in the tests with Cesaroni Technology Inc., of Ontario, Canada. Cesaroni provided key support to the project with the rapid design and development of both aerospike nozzles, as well as the custom solid propellant rocket motors. The configuration of these aerospike nozzles presented unique design and fabrication challenges for Cesaroni.

"For many years NASA Dryden has built small radio controlled and remotely-piloted research models flown at subsonic speeds to explore new concepts such as lifting bodies, parafoil landing systems, and the testing of hypersonic shapes for landing feasibility," said Chuck Rogers, AFFTC project investigator. "With the demonstration of this rocket flight test technique these models can now be tested at transonic and supersonic flight conditions at very low cost," Rogers said.

"We are very excited to have been part of the Dryden Aerospike Rocket Test, and hope that the data collected during the flights at the Pecos County Aerospace Development Center will further the development of the aerospike rocket motor," said George Riggs, president of the Pecos County/West Texas Aerospace Development Corp. "Pecos County looks forward to continued relations with NASA Dryden, Blacksky Corp. and Cesaroni Technology Inc. as the aerospike project moves forward," Riggs said.

NASA Dryden funded the project and instrumented the rockets. Dryden, together with the AFFTC, developed the project's flight test concept, worked the conceptual design of the aerospikes, and are analyzing the flight data. NASA Dryden and the AFFTC are co-located on Edwards AFB, Calif. ✦



NASA Dryden Flight Research Center Photo Collection  
<http://www.dfrc.nasa.gov/Gallery/Photo/index.html>  
NASA Photo: EC04-0113-146 Date: March 30, 2004 Photo By: Carla Thomas

A closeup of one of the Cesaroni Technology, Inc. – constructed aerospike nozzles used in the Dryden Aerospoke Rocket Test.



NASA Dryden Flight Research Center Photo Collection  
<http://www.dfrc.nasa.gov/Gallery/Photo/index.html>  
NASA Photo: EC04-0113-219 Date: March 31, 2004 Photo By: Carla Thomas

Chuck Rogers, Trong Bui, and Scott Bartel make preflight checks on the second of two aerospoke research rockets on March 31, 2004.

**NASA's Space Place**  
<http://spaceplace.jpl.nasa.gov/index.shtml>  
**Sciencecraft**  
 by Patrick L. Barry and Tony Phillips

Probes that can distinguish between "interesting" things and "boring" things are vital for deep space exploration, say JPL scientists.

Along with his colleagues in NASA's Space Technology 6 Project (ST6), JPL's Steven Chien is working to develop an artificial intelligence technology that does just that. They call it the Autonomous Sciencecraft Experiment, and it's one of many next-generation satellite technologies emerging from NASA's New Millennium Program.

As humanity expands its exploration of the outer solar system-or even neighboring solar systems!-the probes we send suffer from two unavoidable handicaps. First, commands radioed by mission scientists on Earth take a long time to reach the probe: six hours for the planned New Horizons mission to Pluto, for example.

Second, the great distance also means that data beamed back by the probe trickles to Earth at a lower bandwidth-often much less than an old 28.8 kbps modem. Waiting for hundreds or thousands of multi-megabyte scientific images to download could take weeks. And often many of those images will be "boring," that is, they won't contain anything new or important for scientists to puzzle over. That's certainly not the most efficient way of using a multi-million dollar probe.

Even worse, what if one of those images showed something extremely "interesting"-a rare event like a volcanic eruption or an unexpected feature like glaciers of methane ice? By the time scientists see the images, hours or days would have passed, and it may be too late to tell the probe to take a closer look.

But how can a probe's computer brain possibly decide what's "interesting" to scientists and what's not?

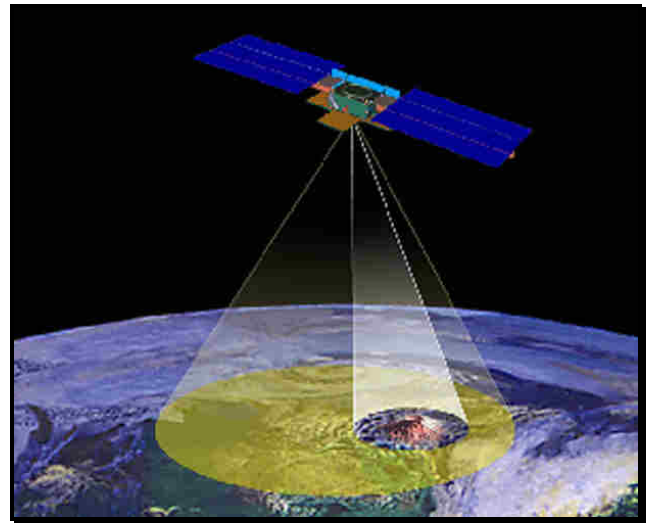
"What you really want is a probe that can identify changes or unique features and focus on those things on its own, rather than just taking images indiscriminately," says Arthur Chmielewski, one of Chien's colleagues at JPL.

Indeed, that's what Chien's software does. It looks for things that change. A mission to Jupiter's icy moon Europa, for instance, might zero in on newly-formed cracks in the ice. Using artificial intelligence to set priorities, the probe could capture a complete movie of growing fractures rather than a single haphazard snapshot.

Until scientists can actually travel to deep space and explore distant worlds in person, they'll need spacecraft "out there" that can do some of the thinking for them. Sciencecraft is leading the way.

Learn more about Sciencecraft at [nmp.nasa.gov/st6](http://nmp.nasa.gov/st6). Kids can make a "Star Finder" for this month and learn about another of the ST6 technologies at [spaceplace.nasa.gov/st6starfinder/st6starfinder.htm](http://spaceplace.nasa.gov/st6starfinder/st6starfinder.htm).

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration. ✦*



**The Autonomous Sciencecraft technology that will be tested as part of NASA's Space Technology 6 mission will use artificial intelligence to select and transmit only the scientifically significant images.**

## THOR Meeting Minutes

Compiled by Richard Burney, Secretary

### THOR Meeting Minutes 3/2/04

**Attendance:** Richard Burney, Bruce Lee, Joe Michel, Jon Damme, Troy Muller, Arley Davis, Rick Bosworth, Don Rice, Jeff Moon, Kevin Rich, George Wimmer, Scott Pearson, Dave Pares, Eric Kopiasz, Larry Kopiasz, Barry Connor, Greg Rothman, Kevin Trojanowski, Denver Hansen, Matt Jones, Bill Richardson, and Larry Drake.

**Meeting starts at 19:05.**

First sport launch of the year will be held this Sunday, March 7<sup>th</sup>.

First high power launch of the year will be held Saturday, March 20<sup>th</sup>.

Auction starts at 19:15



Some of the goodies up for auction.



We've got a full house here!

**Meeting and auction adjourned at 21:30.**

### THOR Meeting Minutes 4/6/04

**Attendance:** Richard Burney, Matt Jones, Arley Davis, Kevin Rich, Sherri Bosworth, Rick Bosworth, Barry Connor, George Wimmer, Andrew Wimmer, Ann Wimmer, Thomas Kernes, Nathan Warner, Greg Rothman, Jeff Moon, Bruce Lee, Ken, Scott Fraiser, Doug Gard, Joe Ebacher, Troy Muller, Jon Damme, and Kevin Trojanowski.

**Meeting starts at 19:10.**

Bruce talks about the **ATF ruling** (both the good and bad points), possible future TV appearances by both Ky Michaelson and himself, the **CSXT Space Shot**, and the **Balls** launch in September.

Jeff Moon shows some of his current projects including a possible night rocket and the rocket he will use to recertify Level 1.

Scott Fraiser is introduced to the club. Scott plans on doing his Level 1 flight at FOTF.

Doug Gard is introduced to the club. Doug is an early Tripoli Member (his TRA number is 3 digits long!).

Greg Rothman went to Manson High School in Manson, IA recently to help with their entry into **Team America**.

Nathan Warner's new Vaughn Bros. Extreme 54 is nearly complete. It will use dual-stage deployment.

Thomas Kernes shows his Level 3 rocket – near minimum diameter, carbon fiber tubing, M1315 powered, 17,000' projected altitude, and will be flown at **Black Rock, NV** later this year.

Jon Damme passes around an issue of MIT's **Technology Review** magazine.

Andrew Wimmer shows some footage from his camcorder of the brush fire that took place at the March 20<sup>th</sup> launch. Andrew also shows some footage of his Team America rocket in action.

Sherri Bosworth got a BSD Diablo kit which she'll be flying with an M (all courtesy of Rick!) for her Level 3. Rick Bosworth discusses the mentoring he has been doing for one of the local entries into NAR's Team America program.

Kevin Trojanowski reports that **Animal Motor Works** has a special going on through the month of April.

Troy Muller offers to make a t-shirt for Fire on the Farm. Motion made and passed.

Arley Davis was able to find a website that lists every model rocket nosecone ever made. Arley shows some of his latest rocket acquisitions.

Due to some of the mishaps that occurred at the March 20<sup>th</sup> launch, the high power pads will be moved further back from the flight line. Instead of concrete for the pads to sit on, other options (ie. patio tiles) are discussed.

**Meeting adjourned at 21:30. ✦**



**T.H.O.R.**

**The Heartland  
Organization of  
Rocketry**

**What is THOR?**

The Heartland Organization of Rocketry (THOR) is both an officially sanctioned Prefecture of the Tripoli Rocketry Association (Tripoli Nebraska #46) and Section (#562) of the National Association of Rocketry. THOR strictly adheres to the safety guidelines established by both rocketry associations.

THOR has been actively involved in the hobby of model rocketry (low power, high power, and experimental) in southeast Nebraska and southwest Iowa since the early 1990's. THOR members, along with their projects, have appeared on national television programs such as *Rocket Challenge* (The Discovery Channel), *Extreme Machines* (The Learning Channel), *Junkyard Wars* (TLC), and *Ripley's Believe It Or Not* (TBS).

**When and where does THOR meet?**

Meetings are usually held the first Tuesday of the month at the **La Vista Community Center at 8116 Parkview St., La Vista, NE** – turn east at the Sinclair Gas Station on 84<sup>th</sup> St. and go a block east (look for the big US flag). Visitors are welcome to attend.

**When and where does THOR fly?**

From March through November, THOR conducts one low power launch (1/4A – F class) and one high power launch (1/4A – N class) each month. Low power launches are held at the soccer fields south of 66<sup>th</sup> and Harrison in La Vista, NE. High power launches are held east of Pickrell, NE which is 30 miles south of Lincoln. THOR conducts two three-day high power rocketry events each year: **Fire on the Farm** and **Nebraska Heat**.

**THOR's Hammer...**

**THOR's Hammer** is the official newsletter of THOR. On average, it is published on a bimonthly basis. **THOR's Hammer** is available to THOR members in PDF format (via e-mail) or is mailed to those without Internet access. Members are welcomed to contribute articles and pictures to the newsletter.

**For additional information...**

For any additional questions or to check on the status of an upcoming launch, call THOR locally at **(402) 896-2069** or toll free at **1-888-546-0396** (there is a voice mail option at the end of the message). Interested parties may also write their inquiries to the address at the right and are also welcome to contact any of THOR's officers.

**THOR Membership Application  
Personal Information**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone Number: \_\_\_\_\_

E-mail: \_\_\_\_\_

**Hobby Information**

How long have you been in model rocketry: \_\_\_\_\_

Do you belong to a national rocketry organization - enter your membership number to the applicable organization:

NAR# \_\_\_\_\_ TRA# \_\_\_\_\_

Are you certified for high power rocketry – check mark your applicable TRA and/or NAR Certification Level:

Level 1 \_\_\_\_\_ Level 2 \_\_\_\_\_ Level 3 \_\_\_\_\_

**Membership Rates**

Half year membership rates will be divided by 2 and will add \$1. Write you check payable to "The Heartland Organization of Rocketry" or "THOR". Mail check and form to the below address or bring to the next meeting.

- Family Membership - \$36
- Senior Membership (18 and over) - \$24
- Junior Membership (18 and under) - \$12
- Correspondence Membership (members over 50 miles away from Omaha) - \$10

I agree to comply with THOR's policies as pertains to the safety guidelines set forth by Tripoli and the NAR. Failure to do so or conduct deemed unbecoming may result in expulsion from the club.

Signature: \_\_\_\_\_

Dated: \_\_\_\_\_

**The Heartland Organization of Rocketry  
6211 South 141<sup>st</sup> St.  
Omaha, NE 68137**

**Membership in The Heartland Organization of Rocketry is open to all interested parties.**