



# ARES COMMUNICATOR

Information for Scott County Amateurs



July, 2011

Accurate, Reliable Emergency Communications

Volume 11, Number 7

## National Weather Service MOU Update

ARRL Letter 06/21/2011

The National Weather Service (NWS) has updated its *Memorandum of Understanding (MoU)* with the ARRL. The updated *MoU* serves “as a framework within which volunteers of the ARRL may coordinate their services, facilities and equipment with the NWS in support of nationwide, state and local early weather warning and emergency communications function.” In May, ARRL President Kay Craigie, N3KN, signed on behalf of the ARRL, and in June, NWS Office of Climate, Water and Weather Services’ Director Dave Caldwell signed on behalf of the NWS. The ARRL and the NWS have had a formal working arrangement since 1986.

The NWS, in the *MoU*, acknowledges that Amateur Radio operators can be of valuable assistance in early severe weather warning and tornado spotting. Through its SKYWARN program, the NWS recognizes that Amateur Radio operators have assisted as communicators and weather spotters since the program began in the late 1960s. “In areas where tornadoes and other severe weather have been known to threaten, the NWS recruits volunteers and trains them in proper weather spotting procedures,” the *MoU* states. “These dedicated citizens help keep their local community safe by conveying severe weather reports to their local NWS forecast office. SKYWARN spotters are integral to the success of our nation’s severe weather warning system.”



“All the National Weather Service personnel I’ve met throughout the country have told me how much they respect

**MOU** *cont'd on page 2*

The ARES COMMUNICATOR is published for the benefit of Amateur Radio Operators in Scott County and other interested individuals.  
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Reader submissions encouraged!

## “What an Unbelievable Response”

Joplin, MO. Tornado ARES Operation

Missouri Section Emergency Coordinator Ken Baremore, W0KRB, sent the following open letter to volunteers involved in the Joplin, Missouri tornado disaster:

“I want to thank all who volunteered and came to Joplin to help with communications as well as those who are still contacting me to see if additional help is needed. Due to the ending of the search and recovery mode and going to the debris and potential body part removal functions, the decision was made that effective at the end of shift today (Monday, May 30, 2011) all ham communications from the EOCs to the field operations are being stood down. We do have some ARES® operators that are scheduled and will continue to work with SATERN through the rest of this week.

“Ham communications between Springfield and Joplin started Sunday night between Freeman Hospital in Joplin and some of the hospitals in Springfield as that was the only means of communication. The links were shut down Monday morning when their needs were met. Likewise, the radio station at the Springfield Red Cross was started Sunday evening to allow communications between the

**Joplin Response** *cont'd on page 2*

## ARES Activities

**Weekly Net Monday 7 PM 146.535 mhz (s)**

**Breakfast Saturday, July 9th**

**Digital Monday July 11th**

### ARES Nets

MN ARES Phone Net  
6:00PM Sunday Freq: 3.568 mhz  
ARRL MN Phone Net  
12:00p, 4:30p CST Daily Freq: 3.568 mhz  
ARRL MN CW Net  
6:30p, 9:50p CST Daily Freq: 3.568 mhz

### NETS WITH OUR NEIGHBORS

North Dakota: Daily 3.937 mhz 6:30pm  
South Dakota: Daily 3.870 mhz 6:00pm  
Wisconsin: Daily 3.985 mhz 5:30pm  
Iowa: Daily 3.970 mhz 12:30/5:30pm

## Joplin Response - cont'd from page 1

Springfield and Joplin offices and to the shelter that was set up in Joplin. That communication link stayed open until Tuesday as it was the only reliable method of communications.

"I asked Cecil Higgins, ACOHA, Assistant DEC for District D, to respond to Joplin on Tuesday morning and act as "Ham in Charge" during the disaster and help to set up additional communication links as required. Thomas Zeller, KB0ORZ, EC for Jasper County, and LaVerne Wilson, NQ0B, EC for Newton County, were already in place, with members of their respective ARES® groups trying to support the EOCs and Red Cross, but relief was needed.

"Our ham operators expended almost 2000 hours during this week. What an unbelievable response. I know that many of you were scrambling to find the necessary equipment to allow you to come help this week. It is a great feeling for me to know that I am part of an organization with people willing to give up vacation or personal time to help out in a time of need. I hope we don't have another need anytime soon but it is nice to know that we have hams and ARES® members ready to serve. Again, I can't thank you all enough."

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## NWS - ARRL MOU - cont'd from page 1

and depend on the Amateur Radio SKYWARN volunteers in their forecast areas," Craigie said. "This year's weather disasters underscore the importance of amateurs becoming trained severe weather spotters and participating in SKYWARN. It's a pleasure for me to work with the National Weather Service, both as an ARRL official and as a local SKYWARN volunteer."

Through the *MoU*, the ARRL will encourage its Field Organization, including ARES®, to "contact and cooperate with National Weather Service Warning Coordination Meteorologists for the purpose of establishing organized SKYWARN networks with radio amateurs serving as communicators and spotters." The ARRL will also encourage its Section management teams "to provide specialized communications and observation support on an as-needed basis for NWS offices in other weather emergencies, such as hurricanes, snow and heavy rain storms, and other severe weather situations." In turn, the NWS will work with ARRL Section ARES volunteers to establish SKYWARN networks, and/or other weather emergency and alert systems.

"The relationship between the National Weather Service and the ARRL has been a model partnership for many years," said ARRL Emergency Preparedness Manager Mike Corey, W5MPC. "The renewal of this *MoU* emphasizes the value of Amateur Radio to the NWS mission."

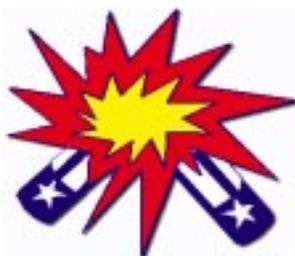
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### Scott County ARES Contacts

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The Random Access Method of Accounting and Control (RAMAC) IBM RAM 305 from the 1950's, is shown. IBM was formed on June 16, 1911, as the Computing Tabulating Recording Co. in a merger of four separate companies. The new business with a plant in Endicott, N.Y., made scales, time clocks, cheese slicers and \_ significantly for its future \_ machines that read data stored on punch cards.

## Take a Dip in the General Pool

Time to test your knowledge of the information covered by the General Class license exam. Each month we'll take a look at a selection from the question pool. Here is this month's sample:

1. What is the maximum transmitting power an amateur station may use on the 12 meter band?  
A. 1500 PEP output, except for 200 watts PEP output in the Novice portion  
B. 200 watts PEP output  
C. 1500 watts PEP output  
D. An effective radiated power equivalent to 50 watts from a half-wave dipole
2. What limitations, other than the 1500 watt PEP limit, are placed on transmitter power in the 14 MHz band?  
A. Only the minimum power necessary to carry out the desired communications should be used  
B. Power must be limited to 200 watts when transmitting between 14.100 MHz and 14.150 MHz  
C. Power should be limited as necessary to avoid interference to another radio service on the frequency  
D. Effective radiated power cannot exceed 3000 watts

*(Check next month's issue of the ARES Communicator for the answer.)*

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## June General Pool Answer

1. When may an amateur station transmit communications in which the licensee or control operator has a pecuniary (monetary) interest?  
A. When other amateurs are being notified of the sale of apparatus normally used in an amateur station and such activity is not done on a regular basis
2. How does the FCC require an amateur station to be operated in all respects not specifically covered by the Part 97 rules?  
C. In conformance with good engineering and good amateur practice

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## ANNUAL 40M FIRECRACKER SPRINT

Sponsored by the PODXS Ø7Ø Club

The goal of this digital mode contest is to work as many stations on 40 meters as possible in a maximum six (6) hours using PSK31 mode. This event is open to all amateur radio operators licensed to operate on the HF bands.

Classes are based on power output: QRP 5 watts, Low Power 50 watts, Medium Power 100 watts (all powers maximum output).

All contacts must be made in PSK31 only. The contest is based on local time starting on Saturday 02 July 2011, 2000 and running through Sunday 03 July 2011, 0200. This "rolling start" based on your local time to help equalize 40M band conditions for all contest participants.

Exchange your Callsign, signal report and state/province/country (SPC). The general call for the contest is "CQ 40m test".

Suggested Freqs: 7070 kHz, 7040 kHz (DX).

Fire Cracker sprint scoring: Each contact counts one (1) QSO point, dupes count (0) points. There are multipliers for: Each state/province/country (SPC) worked, counted only once. Use current ARRL DXCC list for country reference. First U.S. station worked counts as two (2) multipliers (country and state). Your final score is (Total QSO Points) x (Total Different SPC's).

Awards will be presented to the top scores for each entry class from each time zone who will receive a certificate, highest Ø7Ø Club member score gets Top Dog. All Ø7Ø Club member entries will receive an Attaboy for their participation in the event. For more information on the Ø7Ø Club check out <http://www.podxs070.com>

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## Q. What is a computer's favorite snack?

**A. Micro chips!**



## 13 Colonies Special Event

1-5 July 2011

If you name the original thirteen colonies now, you will be able to after you work the Original Thirteen Colonies Special Event, over the Fourth of July holiday!

For the third year, stations will be operating in each of the original thirteen colonies. They range from modest home stations

to contest, super stations, OM/XYL teams, satellite and digital stations.



Getting a contact with one or more of the colony states qualifies you for a special event certificate, while all thirteen gets you the coveted “clean sweep” endorsement. Most stations offer a special event QSL card for a SASE. Their were 12,500 total contacts in 2009 and 34,273 in 2010!

The event operates from 12:01 AM Eastern start on July 1st, (That’s one minute after midnight, early Friday morning, July 1st) to 11:59 PM Eastern ending on July 5th (One minute to midnight, late Tuesday night, July 5th).

One contact with a Thirteen Colonies state is sufficient for credit for that state. Additional contacts on other bands or with the other state stations will not get you any more credit. *Please limit yourselves to one contact per state*, so that others may have a chance. This will give the stations with “no gain” antenna’s, stations working 100W, QRP/Mobiles and DX a chance to get all “13” too! We are out to have some fun this 4th of July week, and will try to appease everyone. We thank you for your consideration in advance.

Full details can be found at <http://www.13colonies.info/>. Be sure to click on the map for details of each state’s operations.

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## Space Shuttle Final Flight



NASA space shuttle Atlantis is getting ready for its targeted July 8 launch to the International Space Station, which will close 30 years of the space shuttle program.

The space shuttle Atlantis will carry the Raffaello multipurpose logistics module to deliver supplies, logistics and spare parts to the International Space Station during STS-135, which is the last planned space shuttle mission since STS-1.

The mission will also fly a system to investigate the potential for robotically refueling existing spacecraft and return a failed ammonia pump module to help NASA better understand the failure mechanism and improve pump designs for future systems.

Atlantis is to fly the 12-day mission with four crew members: Commander Christopher Ferguson, Pilot Douglas Hurley and Mission Specialists Sandra Magnus and Rex Walheim.

Atlantis (OV-104) was delivered to Kennedy Space Center in April 1985. It lifted off on its maiden voyage on Oct. 3, 1985, on mission 51-J, the second dedicated Department of Defense flight. Later missions included the launch of the Galileo interplanetary probe to Jupiter on STS-34 in October 1989, and STS-37, with the Gamma Ray Observatory (GRO) as its primary payload, in April 1991.

Atlantis is named after a two-masted sailing ship that was operated for the Woods Hole Oceanographic Institute from 1930 to 1966.

The liftoff from Launch Pad 39A on July 8 at 11:26 a.m. EDT will mark the end of the United States Space Shuttle program.

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*“Opportunities are often missed because we are transmitting when we should be receiving.”*

A. Nony Moose

## 911 – ARES Connection

Lincoln, NE ARES Provide Back-up

When 23,000 people in Lincoln, Nebraska lost their digital phone service on the morning of June 22, local Amateur Radio operators were called in to help provide local residents with a connection to the 911 dispatchers. According to ARRL Nebraska Section Manager Art Zygielbaum, K0AIZ, those trying to call 911 via the digital phone system to report emergencies were met with a recording that said “Due to network difficulties, your call cannot go through.”

“Lancaster County [Nebraska] Emergency Manager Doug Ahlberg activated ARES® because Time Warner Cable lost a significant portion of its digital phone service,” Zygielbaum explained. “More than 30 ARES® members were deployed along major roads throughout Lincoln and at major intersections to help people who might need emergency services. The outage lasted close to 12 hours.” According to the *Lincoln Journal Star*, the digital phone service was working early Wednesday evening on a “rolling restoration” of 911 service. Time Warner said earlier its 10-digit calling issues were fixed.

This is the second time in 16 months that radio amateurs have been asked to provide support due to 911 service disruptions in Nebraska. In April 2010, almost 40,000 people — including Lincoln’s government, business and emergency centers — found out that they had no landline telephone service, as well as spotty cell phone coverage, thanks to an equipment malfunction at a Lincoln switching facility owned by Windstream Communications. According to news reports, residents of 12 counties were unable to contact 911 and dispatch centers used local radio amateurs to help provide communications support.

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## June NIMS Knowledge Solution

Which Command Staff position monitors safety conditions and develops measures for assuring the safety of all assigned personnel?

D. Safety Officer

## New Intro Emergency Comm Class

Registration is now open for the new online Introduction to Emergency Communications course (EC-001). Course information, including a description, pre-requisites and instructions on how to register are available on the ARRL website, [www.arrl.org](http://www.arrl.org).



Slots are still available for the section which begins Friday, July 29; the registration deadline is Sunday, July 17. ARRL Education Services Manager Debra Johnson, K1DMJ, explained that she is also looking for qualified volunteers to provide support as Mentors for the course, as well as Field Instructors who want to lead classroom sessions to instruct the course material.

The new Introduction to Emergency Communications course includes updated content from the previous Basic Emergency Communications Level 1 course, as well as some content previously included in the former Level 2 course. The EmComm training program has been restructured to offer two courses: This enhanced basic course for EmComm volunteers who want to serve as part of an ARES® response team and the management course — Public Service and Emergency Communication Management for Radio Amateurs (EC-016) — for those who are serving in ARES® leadership and management roles.

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## Test Your NIMS Knowledge

Designers of the system recognized early that ICS must:

- Meet the needs of incidents of any kind or size
- Provide logistical and administrative support to ensure that operational staff can meet tactical objectives
- Be cost effective by avoiding duplication of efforts

- a. Allow personnel from a variety of agencies to meld rapidly into a common management structure.
- b. Require that a minimum number of personnel be deployed to perform administrative and logistics functions
- c. Use certified emergency responders to serve as incident commanders and section chiefs
- d. Compensate for incident response failures likely to result from a lack of resources

Check next month's ARES Communicator for the solution



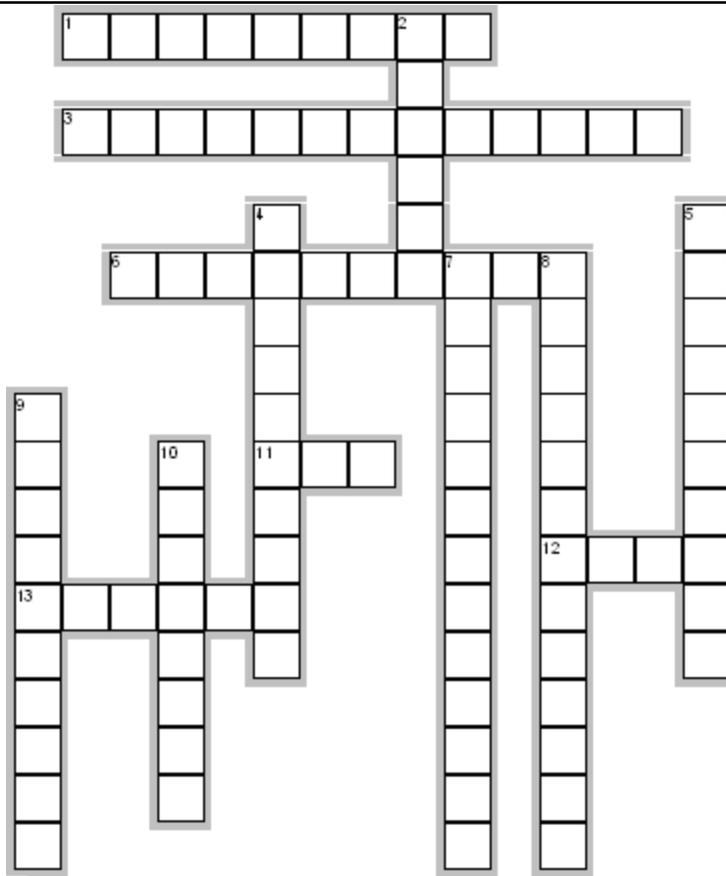
## Golf Talk

### Across

1. The backward part of the swing starting from the ground and going back over the top of the golfer's head.
3. An additional stroke which is added to a golfer's score for a rules violation, going out of bounds, losing a ball, or various other situations.
6. A set of rules for a particular golf course as determined by that course.
11. Term used when a golfer makes a hole in one.
12. To hit the ball and have it curve gradually from right to left (for right-handed golfers).
13. A score of 1 under per for a hole.

### Down

2. A form of competition which breaks down the play into front nine, back nine and overall 18 holes. A point is allowed for each nine and the total 18.
4. A golfer who purposely tells others that he is a worse golfer than he really is in order to gain an edge in competition.
5. A token or small coin which is placed directly just behind the ball in order to mark the position of the ball on the green.
7. Any hazard that runs parallel to the fairway.



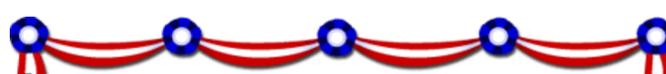
8. A player who has a handicap of 0. This player will theoretically shoot even par or better every time out.
9. This is a shot, which skims very low along the ground.
10. The number of strokes a player may deduct from his actual (or gross) score to adjust his score to that of a scratch golfer.



## June Crossword Solution

### Across

2. BRONXCHEER—When the crowd boos.
3. SHORTSTOP—Defensive player positioned between second and third bases.
5. SACRIFICEBUNT—A bunt designed to advance a runner although the batter will be thrown out.
7. HIT—A play in which the batter safely reaches a base after hitting the ball, without aid from a fielding error or fielder's choice.
10. ACE—A team's best starting pitcher.
11. SAFE—Declaration by the umpire that a runner is entitled to the bases for which he was trying.
12. ALLEY—The section of the outfield between the outfielders. Also called gap.
15. BALTIMORECHOP—A ground ball that hits in front of home plate (or off of it) and takes a large hop over the infielder's head.



### Down

1. GRANDSLAM—A home run that is hit with a runner on every base. This hit scores 4 runs.
3. SUICIDESQUEEZE—A play in which a runner on third breaks toward home on the pitch and the batter's responsibility is to bunt the ball allowing the runner to score.
4. PULLHITTER—A batter that generally hits to the same side of the field that he bats.
6. TEXASLEAGUER—A bloop hit that drops between the infielder and outfielder.
8. PASSEDBALL—A pitched ball missed by the catcher, allowing a runner to advance.
9. WILDPITCH—A pitch so far from the strike zone that the catcher cannot catch or block it, permitting any base runner to advance a base.
13. GOPHER—A ball hit for a homerun.
14. MOUND—Hill the pitcher stands on while pitching

## The W5GI Mystery Antenna

The W5YI mystery antenna is a multi-band wire antenna that performs exceptionally well even though it confounds antenna modeling software. This antenna is reported to be usable on all HF bands.

The design of the Mystery antenna was inspired by an article written by James E. Taylor, W2OZH, in which he described a low profile collinear coaxial array. This antenna covers 80 to 6 meters with low feed point impedance and will work with most radios, with or without an antenna tuner. It is approximately 100 feet long, can handle the legal limit, and is easy and inexpensive to build. It's similar to a G5RV but a much better performer especially on 20 meters.

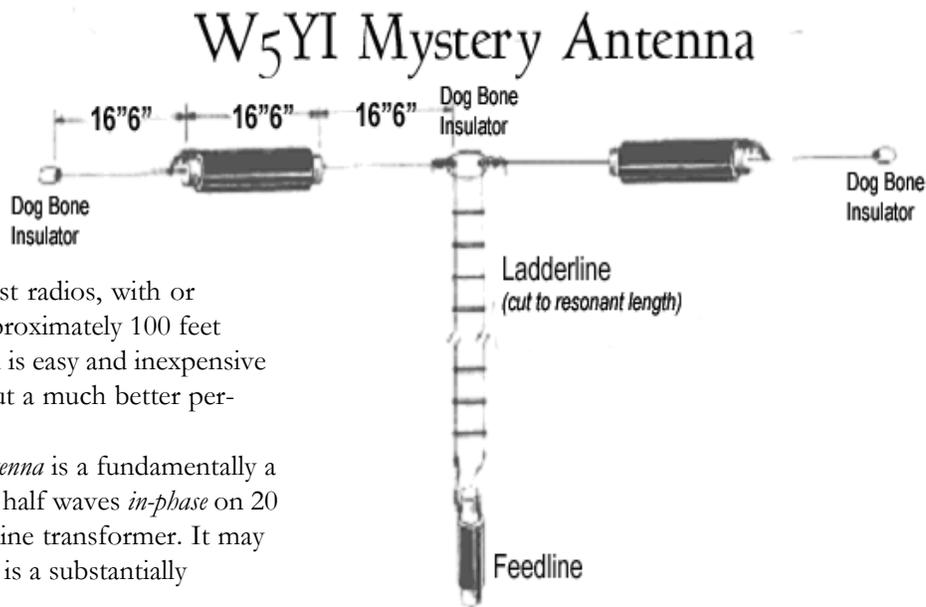
*The W5GI Multi-band Mystery Antenna* is a fundamentally a collinear antenna comprising three half waves *in-phase* on 20 meters with a half-wave 20 meter line transformer. It may sound and look like a G5RV but it is a substantially different antenna on 20 meters.

W5GI Antenna materials list:

- 3 dog bone insulators
- About 70 feet of wire (14 gauge household electrical wire works well,)
- Sufficient twin lead or ladderline to make a half wave section on 20 meters, about 32 ft.
- 34 feet of RG8X mini-coax
- Shrink tubing to cover the exposed coax joints (4 joints)

Antenna building process:

1. Cut the electrical wire into four equal lengths of 17 feet.
2. Cut the two lengths of coax to 16'6" each.
3. Cut a 20 meter half-wave section of twin lead (see note #1).
4. Trim two inches of braid from one end of both lengths of coax.
5. Trim one inch of braid and center insulator from the opposite end of both coax sections.
6. Build a 20-meter dipole without end insulators (see note #2).
7. Connect one end of the dipole to the center conductor of the coax and cover with shrink tubing.



8. Connect the opposite end of the coax to braid AND quarter wave wire section, cover with shrink tubing, and connect to end insulator.
9. Install the twin lead through the holes of the center insulator.
10. Connect the opposite side of the twin lead to the coax feedline.
11. Install the antenna with the center conductor at least 25 feet high.

*NOTE #1: The length of ladderline needs to be determined using the velocity factor for the particular form of ladderline you are using. Typical velocity factors are 450 ohm - .91 and 300 ohm - .88. The length using 300 ohm ladderline would be  $((468/14.25)/2) \times .88 = 28.9'$  Using 450 ohm ladderline results in  $((468/14.25)/2) \times .91 = 29.9'$  Actual length will vary, typically between 27 and 35 ft., depending on type and velocity factor.*

*NOTE #2: The formula for calculating the length of a 1/2 wave dipole is length of one leg =  $(468 / \text{freq in MHz}) / 2$  The length of one leg for 14.25 MHz is approximately 16' 6".*

## Changing Solar Activity

Some unusual solar readings, including fading sunspots and weakening magnetic activity near the poles, could be indications that our sun is preparing to be less active in the coming years.

The results of three separate studies seem to show that even as the current sunspot cycle swells toward the solar maximum, the sun could be heading into a more-dormant period, with activity during the next 11-year sunspot cycle greatly reduced or even eliminated.

The results of the new studies were announced today (June 14) at the annual meeting of the solar physics division of the American Astronomical Society, which is being held this week at New Mexico State University in Las Cruces.

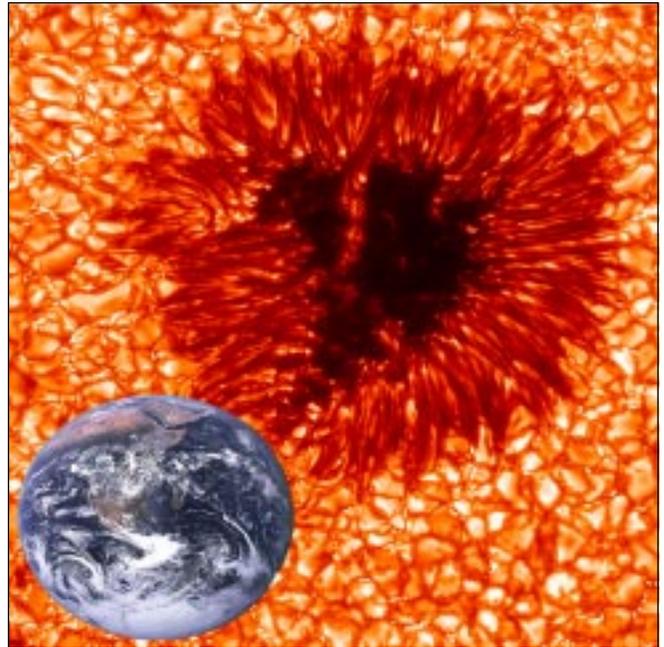
The studies looked at a missing jet stream in the solar interior, fading sunspots on the sun's visible surface, and changes in the corona and near the poles. "This is highly unusual and unexpected," said Frank Hill, associate director of the National Solar Observatory's Solar Synoptic Network. "But the fact that three completely different views of the sun point in the same direction is a powerful indicator that the sunspot cycle may be going into hibernation."

Sunspots are temporary patches on the surface of the sun that are caused by intense magnetic activity. These structures sometimes erupt into energetic solar storms that send streams of charged particles into space.

Astronomers study these mysterious spots because their number and frequency act as indicators of the sun's activity, which ebbs and flows in an 11-year cycle. Typically, a cycle takes roughly 5.5 years to move from a solar minimum, when there are few sunspots, to the solar maximum, during which sunspot activity is amplified.

Currently, the sun is in the midst of the period designated as Cycle 24 and is ramping up toward the cycle's period of maximum activity. However, the recent findings indicate that the activity in the next 11-year solar cycle, Cycle 25, could be greatly reduced. In fact, some scientists are questioning whether this drop in activity could lead to a second Maunder Minimum, which was a 70-year period from 1645 to 1715 when the sun showed virtually no sunspots.

Hill is the lead author of one of the studies that used data from the Global Oscillation Network Group to look at characteristics of the solar interior. (The group includes six observing stations around the world.) The astronomers examined an east-west zonal wind flow inside the sun, called torsional oscillation. The latitude of this jet stream matches the new sunspot formation in each cycle, and models successfully predicted the late onset of the current Cycle 24.



A photo of a sunspot taken in May 2010, with Earth shown to scale. The image has been colorized for aesthetic reasons. This image with 0.1 arcsecond resolution from the Swedish 1-m Solar Telescope represents the limit of what is currently possible in terms of spatial resolution.

"We expected to see the start of the zonal flow for Cycle 25 by now, but we see no sign of it," Hill said. "This indicates that the start of Cycle 25 may be delayed to 2021 or 2022, or may not happen at all."

In the second study, researchers tracked a long-term weakening trend in the strength of sunspots, and predict that by the next solar cycle, magnetic fields erupting on the sun will be so weak that few, if any, sunspots will be formed.

With more than 13 years of sunspot data collected at the McMath-Pierce Telescope at Kitt Peak in Arizona, Matt Penn and William Livingston observed that the average magnetic field strength declined significantly during Cycle 23 and now into Cycle 24. Consequently, sunspot temperatures have risen, they observed. If the trend continues, the sun's magnetic field strength will drop below a certain threshold and sunspots will largely disappear; the field no longer will be strong enough to overcome such convective forces on the solar surface.

In a separate study, Richard Altrick, manager of the Air Force's coronal research program at NSO's facility in New Mexico, examined the sun's corona and observed a slow-down of the magnetic activity's usual "rush to the poles."

## Shuttle Replacement Option?

LOUISVILLE, Colo., 27 June 2011. Sierra Nevada Space Systems (SNC) engineers have achieved important milestones in its development of the Dream Chaser, a Space Shuttle-like human spacecraft that will transport astronauts to the International Space Station (ISS), as part of NASA's Commercial Crew Development Round 2 (CCDev2) program. SNC's development work under the program will culminate in a system-level Preliminary Design Review (PDR) and the Dream Chaser's preparation for atmospheric flight test.

"As the only company under contract to NASA for development of a Shuttle-like spacecraft, SNC is positioned to quickly restore U.S. capability to transport humans to the ISS after the Space Shuttle retires and to support other human spaceflight markets in low Earth orbit," says a spokesperson.



Sierra Nevada Space Systems Dream Chaser

The Systems Requirement Review (SRR), the first milestone completed under the CCDev2 program and a major step in the spacecraft's development, validated SNC's work based on NASA's draft Commercial Crew Program Requirements.

The second milestone, completed only two weeks after Milestone 1, was a review of the Dream Chaser's improved airfoil fin shape, designed to improve the spacecraft handling qualities as it flies in the atmosphere on return from space to a gentle runway landing. Wind tunnel testing and computational fluid dynamics analyses were used to complete the fin selection milestone work.

The Dream Chaser is a lifting body spacecraft based on former NASA design, the HL-20 crew vehicle. Using SNC's proprietary hybrid rocket motor technology, the Dream Chaser is a piloted or autonomous spacecraft which provides safe, reliable, and cost-effective transport of up to seven crew members or a combination of people and cargo to low-earth orbit and returning them safely to the Earth without excessive deceleration or landing forces.

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## Solar Activity - cont'd from page 8

"A key thing to understand is that those wonderful, delicate coronal features are actually powerful, robust magnetic structures rooted in the interior of the sun," Altrrock said. "Changes we see in the corona reflect changes deep inside the sun."

Altrrock sifted through 40 years of observations from NSO's 16-inch (40 centimeters) coronagraphic telescope. New solar activity typically emerges at a latitude of about 70 degrees at the start of the solar cycle, then moves toward the equator. The new magnetic field simultaneously pushes remnants of the past cycle as far as 85 degrees toward the poles. The current cycle, however, is showing some different behavior.

"Cycle 24 started out late and slow and may not be strong enough to create a rush to the poles, indicating we'll see a very weak solar maximum in 2013, if at all," Altrrock said. "If the rush to the poles fails to complete, this creates a tremendous dilemma for the theorists, as it would mean that Cycle 23's magnetic field will not completely disappear from the polar regions. ... No one knows what the sun will do in that case."

If the models prove accurate and the trends continue, the implications could be far-reaching. "If we are right, this could be the last solar maximum we'll see for a few decades," Hill said.

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### ARES Breakfast

Saturday, July 9th  
7:30AM  
Perkins Restaurant  
Savage, MN

### NECOS Schedule July 2011

4 July	WONFE Bob
11 July	KB0FH Bob
18 July	KB0FH Bob
25 July	KC0YHH Tony
1 Aug	N0PI Dan
8 Aug	WONFE Bob