From Our Vice Chair...

ISTS-IAS Membership,
As we wrap up our 2012 Fall Conference, I'd like to thank Adam Puderbaugh (this year’s conference Chair) for a job well done. The conference went off flawlessly, and feedback received was overwhelmingly positive. Adam worked tirelessly to make sure our conference experience was beneficial, and I think we’d all agree – it was! ISTS-IAS leadership is looking at the possibility of making some significant changes to our fall conference for next year, so stay tuned!

Teachers know that one of the most beneficial parts of a conference is the opportunity to interact with industry professionals and representatives (exhibitors). Many of these exhibitors work diligently to ensure teachers have access to the most relevant and “cutting edge” equipment and curriculum available. Without the support of these companies and organizations, our fall conference wouldn’t be the caliber you’ve come to expect. ISTS-IAS leadership wishes to extend an invitation to anyone representing an entity that supports science educators to be present at our 2013 Fall Conference in Ames. So, if you’re a representative or know someone that is, please contact ISTS-IAS for more information and to reserve your spot now!

Lastly, this kind of support doesn’t have to be limited to our fall conference. If you are– or know someone who is - part of a company that would like to support Iowa’s science educators and the Iowa Academy of Science year-round, we have a spot for you! Support from local businesses makes much of what ISTS-IAS does possible. We’d love to visit with you about how we can create a relationship together.

Happy Holidays!

--Eric Hall
STEM Factoids

Data provided by My College Options (https://www.mycollegeoptions.org). For additional information, please contact Ed Doody (ed@nrccua.org).

1. One out of every four students in the class of 2013 is interested in a STEM major/career.
2. Nearly one-third of male high school students are interested in going to a College of Engineering.
3. Fourteen percent of students with STEM interest live in the Northeast.
4. Software Development is the STEM major/career field in which female students show the least interest.
5. Students in New Jersey are the most likely to be interested in Math, compared to other states.
6. American Indian male students have the highest level of interest in Environmental Studies.
7. Over 3% of students in Hawaii are interested in Marine Biology.
8. Over 6% of students in Texas are interested in Mechanical Engineering.
9. Forty percent of students interested in STEM would like to attend a college or university close to home.
10. One-third of students interested in STEM are taking Honors Courses.
11. Thirteen percent of Hispanic students are interested in Engineering majors/careers.
12. Thirteen percent of students interested in STEM plan to pursue leadership activities in college.
13. Male students are 18% more likely than female students to say they will participate in a Math or Science Club in college.
14. Female students are twice as likely to say they want to go to Medical School.
15. STEM interest is 14% higher today than it was a decade ago.

Reminder: 2013 ISTS Fall Conference Date Change

Please spread the word!
Tuesday & Wednesday
October 22 & 23, 2013

Wanted:

- ‘Corporate Sponsors Coordinator’

Wait! Don’t skip this advertisement.

Are you interested in serving our teachers to help improve instruction?

Are you interested in making STEM connections for our students and teachers?

Are you eager to meet new people and make connections across the state?

This opportunity may be just what you’ve been wanting!

We are looking for someone to contact our corporate sponsors and find new sponsors for the ISTS Fall Conference.

Much of the leg-work has already been completed by Josh Hanna and others. You would be working closely with both Iowa Academy of Science leadership and our ISTS leadership. Contact Eric Hall eric.hall@dmschools.org if you have questions.
How To’ Film Series: Prairie Reconstruction

The Tallgrass Prairie Center at the University of Northern Iowa with REAP-CEP funding is producing a film series on prairie reconstruction techniques and procedures. The films are intended for use online, in the classroom and for workshops. These films can be used by land-owners, teachers, students, interpretive naturalists, county roadside managers, agency personnel and prairie enthusiasts.

The films are being developed, shot, and edited by Media Coordinator, David O’Shields, in collaboration with Tallgrass Prairie Center staff members, Dave Williams, Greg Houseal and Daryl Smith.

The overall theme is “How to Plan, Plant and Establish a Reconstructed Prairie.” The 9 topics of the series are designed to provide basic information for those interested in planting prairie, but don’t have the expertise or knowledge to proceed. The 9 films vary in length providing information and techniques needed to provide a basic understanding of the reconstruction process and how to achieve a successful planting.

The titles of the nine topics are as follows:

- How to Plan a Prairie Reconstruction
- Prairie Reconstruction: Basics of Seed Collecting
- Prairie Reconstruction: Basics of Seed Source/Cleaning
- Prairie Reconstruction: How to Design a Seed Mix
- Prairie Reconstruction: Basics of Site Preparation
- Prairie Reconstruction: Basics of Prairie Seeding
- Prairie Reconstruction: How to Calibrate a Native Seed Drill
- Prairie Reconstruction: Techniques of Prairie Establishment
- Prairie Reconstruction: How to Identify Prairie Seedlings

Some of the topics such as How to Plan a Prairie Reconstruction are more general in nature while others such as How to Calibrate a Native Seed Drill deal with a more specific topic.

The films will be available online February 2013 and accessible through the Tallgrass Prairie website (tallgrassprairiecenter.org). People in the intended audience should be able to accomplish the following:

- Teachers will be sufficiently informed and stimulated to develop and/or use outdoor prairie classrooms or to seek the aid of an interpretative naturalist to supplement prairie studies and enhance student learning.
- Students planning the planting of a school prairie outdoor laboratory can use this information as a part of an ecology unit and become an active part of their class in developing the prairie laboratory.
- Agency personnel can use these films to enhance personal knowledge and feel confident in recommending them to clients desiring to reconstruct a native prairie or do a CRP prairie planting.
- A person planning a prairie in their backyard could log onto the website and gain sufficient information to proceed with their project.
eCybermission - Win $600 Equipment Pkg!

A National Science Teachers Association program, registered eCYBERMISSION (www.ecybermission.com) students form teams that will use real-world STEM application skills to research, hypothesize, experiment and draw conclusions while meeting common core standards! Teams then submit their projects to compete for state, regional and national awards, including up to $8,000 in savings bonds (maturity value).

Register your teams today and beat the Registration Deadline! By registering your COMPLETE Teams by midnight on December 14th, they will receive a free STEM Research Kit! A complete team will have 3-4 registered students and they are linked to you as the registered Team Advisor. We can even register your students for you! If you have any questions or concerns, contact us at 1-866-GO-CYBER (462-9237) or missioncontrol@ecybermission.com.

We will award 8 teams per state with monetary prizes! There are currently VERY FEW students registered, so you have a great chance of sponsoring a winning team!

eCYBERMISSION also has incentives to register your entire school for the competition. The Team Advisor that has the most individual students registered on teams by December 14th will receive a gift certificate for $600 towards Vernier Probeware for their classroom! Additionally, all Team Advisors with at least 20 registered students will be entered into a drawing for a separate prize package toward $600 of Vernier Probeware! Probeware consists of easy-to-use data loggers, sensors, experiments and graphing/analysis software that help educators develop the next generation of scientists and engineers! Check out www.vernier.com to see some examples and then start registering your students today! The final teacher and student registration deadline is December 14 and the projects are due on March 1, 2013.

Need one more incentive to teach STEM skills in your classroom?

Check out NSTA's eCYBERMISSION Competition: https://www.ecybermission.com. This challenge, sponsored by the U.S. Army and administered by NSTA, is a free, web-based, science, technology, engineering, and mathematics (STEM) competition for students in grades six through nine.

eCYBERMISSION challenges teams of students to identify a problem in their community and use the scientific method, scientific inquiry, or engineering design process to find a solution. The top winning teams can receive up to $8,000 in U.S. EE Savings Bonds.

Professional Development at Princeton


Every day features a stimulating mix of laboratory projects and discussions with colleagues and Princeton faculty. Lunch is served while world-renowned scientists share their passion for research, and their tales of adventure, to inspire your students.

Earn a stipend, and 80 professional development hours while living on the Princeton campus. Our support continues into the school year with loaner kits packed with equipment, reagents and supplies. For more information on these programs see www.hhmi.princeton.edu

Conservation Speakers Requested

The Iowa Conservation Education Coalition and the Iowa Association of Naturalists are requesting speaker proposals for the 2013 Midwest Environmental Education Conference (MEEC), “Seasons of Plenty”. MEEC is a biennial conference including affiliate members of the North American Association of Environmental Educators (NAAEE) from the states of Wisconsin, Illinois, Minnesota, and Iowa. However, MEEC welcomes attendees from other states as well as the providences of Canada.

This regional gathering is meant to enlighten and inspire teachers, naturalists, and other environmental educators and will be held at the Marriott Hotel and Conference Center in Coralville, Iowa, September 25-28, 2013.

For more information: www.iowaee.org
Water Online Course: Placed-based Investigations

Engage your students in real scientific research of a local water issue while you improve your own content knowledge and pedagogy. With your students, you will develop and conduct a place-based water student investigation unit (or enhance a current unit). The final product of the course will be a presentation of the results and conclusions of your investigation presented at the Iowa Academy of Science Annual Meeting at Simpson College on April 20th, 2013.

Course content will focus on:
- sound pedagogy (how to engage students in authentic science investigations) grounded in the 5 Essential Features of Inquiry
- developing/enhancing content knowledge about water and specific place-based water issues, and
- student learning through integration of concept-related support activities.

Course Objectives
Participants completing this course will:
1. demonstrate appropriate use of instructional strategies and resources appropriate to the content area as they personalize and implement course homework assignments within their own classrooms.
2. deliver inquiry based instruction as they develop and implement a place-based student science investigation (and potential project) with their own students.
3. work collaboratively to improve professional practice by supporting fellow participants in the success of their investigation/project plans through use of the course discussion boards.
4. communicate scientific explanations and recommendations as they present their water resource investigation to members of the Iowa Academy of Science Ecology and Conservation or Environmental Science and Health Sections.

Course Requirements
The course is arranged on a weekly basis – Monday through Sunday. Each week a new course module focusing on a different topic related to the 5 Essential Features of Inquiry, place-based learning and Iowa water issues will be available. Each module will include three parts:

- A reading assignment - designed to provide content that will assist in the success of the classroom implementation assignment.
- A classroom implementation assignment – involves doing something with your students or preparing to do something for use with your students.
- A forum discussion assignment - provides an opportunity to debrief the reading and classroom assignments, share ideas and resources, monitor progress, and support each other’s work.

Participants will only have access to the current Module to complete assignments. Assignments will be available at 12:00 a.m. on Mondays and must be completed by 11:00 p.m. on Sunday.

Exploring Iowa’s Natural Resources On-line Course
January 21 - May 5, 2013

The goal of this course is to help you utilize local natural resources as unifying themes to implement Iowa Core concepts in your curriculum. You will work in small groups and individually to create a network of contacts and resources to teach natural resource concepts. Group and individual assignments will build on each other throughout the course.

The course is arranged on a weekly basis. Each week a new Module (with required readings, resources and references, assignments, and occasional guest speaker discussions) will become available. Each module is designed to introduce you to a specific environmental education topic, strategy or skill. You will only have access to the current Module to complete assignments. Modules that have been completed will be visible the remainder of the class so you can go access previous assignment postings and resources.

You are required to spend 4-5 hours per week on-line completing assignments and participating in group discussions. You should be comfortable navigating web pages, have access to internet and a computer on a daily basis, and possess basic computer skills. A majority of the course materials will be provided on a CD with linked pdf files.

Course Objectives
Participants completing this course will:
- Become more knowledgeable about local natural resources and issues facing them.
- Increase knowledge/skills on finding credible electronic resources.
- Be acquainted with a variety of additional resources to enhance your personal knowledge of Iowa’s natural resources and issues facing them.
- Develop a project-based learning unit, which you can use in your teaching situation, based on a local natural resources topic/concern.
- Demonstrate appropriate use of instructional strategies and resources appropriate to the content area.

How to Register
- Registration deadline is January 7 (You must register on-line) for the Water Course, and January 11 for the Natural Resource Course (https://prodev.aeapdonline.org/4DCGI/22007499991302INV&). Registration fee includes materials and 2 license renewal credit for $75.

These courses are being offered by AEA PD Online, a joint initiative by all of Iowa's Area Education Agencies. These course therefore uses AEA PD Online's alternative fee schedule for license renewal credit. Transcripts and credit will be issued by AEA PD Online instead of Heartland AEA.

For More Information on Both Courses
Contact: Shannon Hafner, Aquatic Education Program, Iowa Department of Natural Resources, 2473 160th Road, Guthrie Center, IA 50115, (641) 747-2051, Shannon.Hafner@dnr.iowa.gov
**Iowa Renewable Fuels Association “Fuel to the Future” HS Video Contest**

**VOTE FOR BIODIESEL AND E15!**

Iowa Renewable Fuels Association is awarding a **$1000 grand prize** to the student(s) who create the best “campaign ad” video urging Iowans to choose renewable, American E15 and biodiesel at the pump in 2013 and beyond. There will also be a **$600** award for 2nd place and a **$400** award for 3rd place. Submit your video today!

**Contest Requirements:**
- IRFA is looking for the best student-produced “campaign ad” video to convince Iowans to choose renewable, American E15 and biodiesel at the pump in 2013
- Must be a current Iowa high school student (public, private or home school)
- No limit on number of participants in a video, but only one award will be given per video, not per student.
- Videos may not exceed 2 minutes in length and must be submitted to IRFA on a DVD, flash drive, or secure web link.
- Top 3 Videos will be awarded cash prizes, posted on IRFA’s YouTube® Channel and featured at the 2013 Iowa Renewable Fuels Summit. Entries must be received by January 18, 2013.

**Sponsored by Faegre Baker Daniels.** Visit our website for contest rules and to apply for the Fuel the Future contest today: [http://iowarfa.org/FueltheFuture.php](http://iowarfa.org/FueltheFuture.php)

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**Apply Now for the 2013-14 Albert Einstein Distinguished Educator Fellowship**

The Albert Einstein Distinguished Educator Fellowship Program is now accepting applications for the 2013-2014 Fellowship Year. The Einstein Fellowship is a paid fellowship for K-12 science, technology, engineering, and mathematics (STEM) teachers. Einstein Fellows spend 11-months in Washington, D.C., serving in a federal agency or on Capitol Hill. Applications are due by 11:00 pm (EST) December 5, 2012. To learn more about the program and to apply, visit [www.einsteinfellows.org](http://www.einsteinfellows.org).

Back by popular demand, Population Connection is again hosting a video contest for high school students. The contest challenges students to create a video public service announcement that illustrates the connection between population reaching seven billion as it relates to environmental and global issues. Three grand prizes of $1,000 will be awarded as well as nine other cash prizes.

The deadline for entries is **February 21, 2013** and hopefully this gives you enough time to work the contest into your syllabus. As an added incentive, if you have 10 or more students participate in the contest, we'll send you a set of Population Education resources for your classroom. World population reached 7 billion just last fall and this teachable moment is something you don't want to miss!

To help you share this information, here is a [printable flyer](http://www.worldof7billion.org/student_video_contest) to hang in your classroom or school. Full contest guidelines, resources for research, past winners, and more can be found at [www.Worldof7Billion.org/student_video_contest](http://www.worldof7billion.org/student_video_contest). You can also learn more from our ‘We Are Teachers' podcast, located here: [http://](http://)

**ISU Computational Thinking Teacher Certification Class**

The Department of Computer Science has worked with the Iowa Department of Education and the Heartland AEA to create a two day teacher training workshop to be held June 17 and 18, 2013 at Iowa State University.

The content of the 2 day class is shown below:

**Day 1 (7.5 hours)**
- Welcome, Introductions, Setting Norms
- Review of course expectations and assessment
- Overview of agenda
- Introduce STEM Goals and Iowa Core Connections
- Present/Discuss Computational Thinking and Computational Modeling Examples
- Lunch
- Demonstrate Scratch™ Programming-Introduction and participant practice

**Day 2 (7.5 hours)**
- Uncover Universal Construct Connections
- Discuss Modeling STEM Concepts with Computational Models (basically whiteboard and Scratch™)
- Interact in Small Groups using Scratch™ to develop Models
- Lunch
- Develop a plan of how students will use Scratch™ to develop models within subject-alike groups
- Presentations of models by Small Groups
- Develop action plan for how the students will use Scratch™

For more information email us at [allscience@cs.iastate.edu](mailto:allscience@cs.iastate.edu).
Computational Thinking

Training/Competition - ISU

In our efforts to engage more students, the Iowa State University’s Department of Computer Science has introduced the Computational Thinking Competition (http://www.cs.iastate.edu/ctc.shtml). The goal of the competition has been to require students to solve problems using computational thinking.

The department also hosts a series of full day workshops on computational thinking for a combined audience of students, parents, professional educators to help students and teachers understand the concepts of computational thinking. The focus of the workshops is to show how it was possible to model concepts in a variety of K-12 content areas using computational models. The workshops’ afternoon session was focused on introducing the students to the Scratch™ programming language. The workshops for 2012-2013 will be held at Iowa State University in Pearson Hall 105-109 on November 3, 2012, December 1, 2012, January 12, 2013, February 2, 2013, March 2, 2013.

For more information email us at allscience@cs.iastate.edu.

Project Dragonfly &
Earth Expeditions

Applications are being accepted now for 2013 summer/fall graduate field courses and the Global Field Program master’s degree offering international studies in 12 countries throughout Africa, Asia, Australia and the Americas.

Miami University offers these graduate-credit courses at a fraction of actual costs to engage a diverse group of educators and other professionals in global leadership, inquiry and environmental stewardship. The $1,340 course cost includes all basic in-country expenses and tuition for seven graduate credit hours. Accepted students are responsible for airfare.

Course sites for 2013 include the Amazon, Australia, Baja, Belize, Borneo, Costa Rica, Guyana, Kenya, Mongolia, Namibia, Thailand, and new this year Hawai’i. Applications for 2013 courses are due Jan. 28, 2013.

Earth Expeditions and the GFP, which can be completed part-time from anywhere in the United States or abroad, are open to educators and other professionals from all disciplines and settings. For information and to apply, visit:

Earth Expeditions: http://earthexpeditions.org/
Global Field Program: http://gfp.projectdragonfly.org/

Project Dragonfly reaches millions of people each year through inquiry-driven learning media, public exhibits and graduate programs worldwide. Dragonfly is based at Miami University, a state university in Oxford, Ohio, established in 1809 and listed as one of the eight original Public Ivies.

View updates and "Like" Project Dragonfly on Facebook at http://www.facebook.com/PrjDragonfly.

Project Dragonfly
Miami University
Oxford, Ohio 45056
513.529.5103
http://www.EarthExpeditions.org

One More Time:
2013 ISTS Fall Conference
Date Change

Please spread the word!
Tuesday & Wednesday
October 22 & 23, 2013

ISTS Newsletter November, 2012
Diversifying Science Classroom Practice - Engaging with the ‘Youtube Generation’

By: Brendan O’Brien

What is www.60secondscience.net? 60SecondScience is a fully online International Video Competition sponsored by the Department of Education (DEECD-Innovation Next Practice Division), Victoria, Australia. Since its first iteration in 2008, it has enjoyed continual growth and appeal, from 30 Victorian school-only participants, to well over 300 science videos uploaded in 2012, with over 1100 registering from 40 countries. The competition is Free to Enter and links directly to required student outcomes over a number of Science, Citizenship and ICT Learning Standards. $10,000 in cash prizes is distributed each year, as determined by a prestigious International panel of judges. There are Divisions which cater for students of different ages.

Why is www.60secondscience.net used in Science Classrooms?
Teachers can engage the interests and skills of students in a way that increases the depth of their science knowledge as they hone their multimedia skills. Many of today’s students are an entrenched part of the ‘youtube generation’ and are more than comfortable with being producers of content, whereas other generations were comfortable as mere consumers of content. Many students are ‘over’ powerpoint reports by the time they get to secondary and High School settings, and are happy to shoot video on their smart-phones, flipcams, videocameras or webcams. The competition is easily adapted to be used not as an add-on, but as a contingent element within the existing science curriculum

How is www.60secondscience.net used in Secondary/High School Science Classrooms?
A. Teachers give students the option of making a 60second video to demonstrate their understanding of a topic or unit of work they are studying/researching in any area of the senior science curriculum. Eg Chemistry-physics: Sublimation, Doppler Effect, Newton’s Laws, Occipital Lobe, Projectile Motion, Chemical Bonding, Hot air balloon physics

Making a short explanatory video is often done as an alternative to producing a written report, poster or Powerpoint.


In both cases, students are required to research deeply and collaborate closely to refine their understandings and condense their knowledge to convey their key concepts and ideas into the 60second format.

How is www.60secondscience.net used in Primary/Elementary Science Classrooms?
Students work with their teacher on a particular science topic or integrated study unit, and produce a video over a number of weeks as part of their weekly routine. This can be used as a science teaching strategy at any grade level. eg. Grade 3/4: The Mpemba Effect, Grade 5/6 Lemon Battery, Grade 1 Temperature, Grade 6 Plant Osmosis

How does www.60secondscience.net support Multicultural Classrooms?
The LOTE Divisions encourage entrants to use Languages Other Than English. Eg Cantonese, Indonesian, Italian, Chinese, French, Cantonese, Malayalam, Divisions:

International primary / elementary school division - $400/$100
International secondary / high school division $400/$100
International Open – $400/$100 professional/amateur film-makers, teachers.

International LOTE –$250 with English subtitles, spoken in a Language Other Than English.
Best Cinematography – $250 for videos in any Division
Best Animation - $250 for videos in any Division
Australian Primary Student – Prizes in each State/territory
Australian Secondary Student – Prizes in each State/territory
Australian Primary Student LOTE
Australian Secondary Student LOTE
Worst Cola-Candy-Mint-Lolly video - All Cola-Candy-Mint-Lolly videos are AUTOMATICALLY registered in this Division) and the ‘Winner’ gets a Certificate + offer of free online video production and science workshop for teachers and students

2013 Deadline: register by 5 August 2013, Upload videos by 5 August 2013

Contact:

Brendan O’Brien
Science, eLearning | DEECD, Hume Region, Victoria, Australia | 0438 420 027

Convenor: www.60secondscience.net
Twitter: @Brendano http://twitter.com/brendano
Facebook: http://www.facebook.com/60SecondScienceVidComp

OPPORTUNITIES

www.60secondscience.net

Convenor: www.60secondscience.net
Twitter: @Brendano http://twitter.com/brendano
Facebook: http://www.facebook.com/60SecondScienceVidComp
It Takes More Than Warm Porridge to Make a Goldilocks Zone

by Diane K. Fisher

The “Goldilocks Zone” describes the region of a solar system that is just the right distance from the star to make a cozy, comfy home for a life-supporting planet. It is a region that keeps the planet warm enough to have a liquid ocean, but not so warm that the ocean boils off into space. Obviously, Earth orbits the Sun in our solar system’s “Goldilocks Zone.”

But there are other conditions besides temperature that make our part of the solar system comfortable for life. Using infrared data from the Spitzer Space Telescope, along with theoretical models and archival observations, Rebecca Martin, a NASA Sagan Fellow from the University of Colorado in Boulder, and astronomer Mario Livio of the Space Telescope Science Institute in Baltimore, Maryland, have published a new study suggesting that our solar system and our place in it is special in at least one other way.

This fortunate “just right” condition involves Jupiter and its effect on the asteroid belt.

Many other solar systems discovered in the past decade have giant gas planets in very tight orbits around their stars. Only 19 out of 520 solar systems studied have Jupiter-like planets in orbits beyond what is known as the “snow line”—the distance from the star at which it is cool enough for water (and ammonia and methane) to condense into ice. Scientists believe our Jupiter formed a bit farther away from the Sun than it is now. Although the giant planet has moved a little closer to the Sun, it is still beyond the snow line.

So why do we care where Jupiter hangs out? Well, the gravity of Jupiter, with its mass of 318 Earths, has a profound effect on everything in its region, including the asteroid belt. The asteroid belt is a region between Mars and Jupiter where millions of mostly rocky objects (some water-bearing) orbit. They range in size from dwarf planet Ceres at more than 600 miles in diameter to grains of dust. In the early solar system, asteroids (along with comets) could have been partly responsible for delivering water to fill the ocean of a young Earth. They could have also brought organic molecules to Earth, from which life eventually evolved.

Jupiter’s gravity keeps the asteroids pretty much in their place in the asteroid belt, and doesn’t let them accrete to form another planet. If Jupiter had moved inward through the asteroid belt toward the Sun, it would have scattered the asteroids in all directions before Earth had time to form. And no asteroid belt means no impacts on Earth, no water delivery, and maybe no life-starting molecules either. Asteroids may have also delivered such useful metals as gold, platinum, and iron to Earth’s crust.

But, if Jupiter had not migrated inward at all since it formed farther away from the Sun, the asteroid belt would be totally undisturbed and would be a lot more dense with asteroids than it is now. In that case, Earth would have been blasted with a lot more asteroid impacts, and life may have never had a chance to take root.

The infrared data from the Spitzer Space Telescope contributes in unexpected ways in revealing and supporting new ideas and theories about our universe. Read more about this study and other Spitzer contributions at spitzer.caltech.edu. Kids can learn about infrared light and enjoy solving Spitzer image puzzles at spaceplace.nasa.gov/spitzer-slyder.

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