SPaRk
The AAS Education Newsletter
January 2010, Issue 9

IYA in Review: Keeping the Momentum of the International Year of Astronomy

The International Year of Astronomy 2009 commemorates the 400th anniversary of Galileo's first use of a telescope to study the skies, and also the publication of Kepler's *Astronomia Nova*. And what a celebratory year it has been! Significant IYA working group projects from the United States include the Galileoscope, Dark Skies Awareness, and "From Earth to the Universe" image exhibits. Even more importantly, there has been participation from amateurs and volunteers organizing an amazing number of astronomy outreach events around the globe. From "100 Hours of Astronomy" to the "Galilean Nights" international star parties, and even a star party at the White House, it has been quite a successful year.

We want to keep up the momentum, and to build upon the partnerships and friendships that have been made, in order to continue the impact from IYA. Enjoy reading the list below of all the ongoing programs. There are many outreach efforts that will be growing into 2010 and beyond, and we hope everyone in the astronomical community will enjoy finding at least one IYA project to continue supporting!

Andrea Schweitzer
IYA U.S. Project Manager

IYA Education Programs

Galileo Teacher Training Program in the U.S.:
www.gttpusa.org

Galileoscope education programs (click Educate):
www.galileoscope.org

ASP IYA education programs:
www.astrosociety.org/iya/index.html

An Introduction to Astronomy Education Resources:
www.manyone.net/cosmicclearinghouse/articles/view/139822/

IYA Citizen Science Programs

Monitoring of the variable star Epsilon Aurigae workshop:
www.citizensky.org

GLOBE at Night:
www.globe.gov/GaN/

Great World-wide Star Count:
www.starcount.org

Galaxy Zoo:
www.galaxyzoo.org

NASA's Mars science program:
beamartian.jpl.nasa.gov

IYA U.S. Nationwide and Worldwide Programs

From Earth to the Universe (and listings of upcoming U.S. events
and locations):
www.fromearthtotheuniverse.org
www.fromearthtotheuniverse.org/table_events.php

Visions of the Universe: Four Centuries of Discovery library:
www.ala.org/visionsoftheuniverse/

Astronomy in Second Life:
www.secondastronomy.org

365 Days of Astronomy:
www.365daysofastronomy.org

Astronomy Lectures Podcasts:
www.astrosociety.org/education/podcast/index.html

Astronomers Without Borders:
www.astronomerswithoutborders.org/

The World at Night: One People, One Sky:
www.twanight.org

The National Park Service summer star parties and Dark Skies events:
www.darkskiesawareness.org/night-in-park.php

Two Small Pieces of Glass Planetarium Program (click Planetarium Program):
www.400years.org

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In This Issue

Welcome to this issue of *Spark*!

Well, we did it! It's now 2010, and the official end of the International Year of Astronomy 2009. Everyone who has contributed to this worldwide effort should be very proud of themselves, as should we all be proud of them. We were particularly heartened reading Andrea Schweitzer's (US IYA Project Manager) article in this issue of *Spark* about all of the IYA projects and programs that will be continuing into 2010 and beyond. I hope each of us stays, or gets, involved with at least one of these—let's keep the IYA momentum going.

Also in this issue, we'll hear from Audra Baleisis (Swiss Federal Institute of Technology) about some issues facing graduate students trying to learn the language of giving presentations and asking questions within our community. We also hear from Jarod Luebbert and Mark Sands (Southern Illinois Univ., Edwardsville) about some cool new stuff they're creating to merge the use of WorldWide Telescope into Galaxy Zoo and Wordpress. Related to Galaxy Zoo, we'll hear from Jordan Raddick (Johns Hopkins Univ.) about why people are motivated to become Citizen Scientists in the Zoo. Also, Jeff Sudol (West Chester Univ.) gives us his review of a recently published book on using data to make decisions about revising our courses. We'll also hear from several of our columnists, and we'll catch up with what's new in *Astronomy Education Review*.

We encourage all members of the community to contribute articles to *Spark*, which is published twice a year to coincide with the AAS national meetings. If you are interested in making a contribution, we recommend sending us a brief description of your proposed contribution in advance so that we can discuss your idea and suggest a suitable article length (generally around either 400 or 800 words). Our editorial meetings are held in February and September of each year, so suggestions received before those months are easiest for us to incorporate. Article deadlines are March 1 for the issue released at the summer meeting, and October 1 for the winter meeting issue. We look forward to discussing your ideas for contributions, and to reading your articles!

Gina Brissenden & Jake Noel-Storr
Editors

spark@aas.org

IYA in review continued

Ongoing IYA Calendar (2010 and beyond)

GLOBE at Night (two weeks in March near new moon):
www.globe.gov/GaN/

Earth Hour (in March):
www.earthhour.org

Sun-Earth Day (on or near the spring equinox, approx. March 21):
www.sunearthday.nasa.gov

International Sidewalk Astronomy Night (March 20, 2010):
www.sidewalkastronomers.us

Yuri's Night (on or near April 12):
www.yurisnight.net

International Dark Skies Week (April 9-15, 2010):
www.darkskiesawareness.org/idsw.php

World Night In Defense of Starlight:
www.starlight2007.net
Earth Day (April 22)
www.earthday.net

Astronomy Week (late April or early May):
www.astroleague.org

Cosmos in the Classroom 2010 (and the Annual ASP Meeting; 31 Jul.-4 Aug., 2010): www.astrosociety.org/events/meeting.html

Space Day (the first Friday each May):
www.spaceday.org

National Park programs (summer star gazing events):
www.darkskiesawareness.org/night-in-park.php

World Space Week (in early October):
www.worldspaceweek.org

Great World-wide Star Count (in October):
www.starcount.org

Astronomy Education Review

Volume 8 is now available—and still being added to! We hope you'll visit AER at its new AAS home (aer.aip.org). The journal welcomes papers and articles on a wide range of topics in education and outreach. Following are some of the articles you'll find in the current issue:

• Survey of K–12 Science Teachers' Educational Product Needs from Planetary Scientists (Slater, Slater, &Olsen)

• Advanced Undergraduate and Early Graduate Physics Students' Misconception About Solar Wind Flow: Evidence of Students' Difficulties in Distinguishing Paradigms (Gross & Lopez)

• Clickers as Data Gathering Tools and Students' Attitudes, Motivations, and Beliefs on Their Use in this Application (Prather & Brissenden)

• The Effect of 3D Computer Modeling and Observation-Based Instruction on the Conceptual Change Regarding Basic Concepts of Astronomy in Elementary School Students (Küçüközer, Korkusuz, Küçüközer, & Yürümezoğlu)

• Using the Star Properties Concept Inventory to Compare Instruction with Lecture Tutorials to Traditional Lectures (LoPresto & Murrell)

• Gender Differences in Turkish Primary Students' Images of Astronomical Scientists: A Preliminary Study with 21st Century Style (Korkmaz)

• The Modern U.S. High School Astronomy Course, its Status and Makeup, and the Effects of No Child Left Behind (Krumenaker)

• Meta-analysis of Planetarium Efficacy Research (Brazell & Espinoza)

• College Students' Preinstructional Ideas About Stars and Star Formation (Bailey, Prather, Johnson, & Slater)

• Bill Gates' Great-Great Granddaughter's Honeymoon: An Astronomy Activity for Several Different Age Groups (Fraknoi)

• A Simple Demonstration of Absorption Spectra Using Tungsten Holiday Lights (Birriell)

Tom Hockey will be replacing one of us (Sidney Wolff) as editor of AER in January. This transition is a good time for us to express our thanks to all the authors who supported this fledgling journal with your papers. In a few short years, AER has become an important resource for astronomy educators. We hope you will continue to submit your best work to AER and to support Tom in his efforts to make the journal even better.

Sidney Wolff and Andrew Fraknoi
Editors

Astronomy Education Research

Columnist: Ed Prather, Univ. of Arizona

There are several astronomy education programs providing opportunities for non-science majoring students and pre-service teachers to engage in science investigations using real data. While these efforts are providing students and teachers with experiences to learn more about the nature of science, they typically do not have an authentic impact on the science results of the discipline, itself. In addition these programs are not available for the general public-at-large. In this edition of the Astronomy Education Research section of Spark, Jordan Raddick from Johns Hopkins University will tell us about an investigation into the users of "GalaxyZoo.org," a program in which any citizen has the opportunity to work as a real scientist, processing real science data that contributes to our understanding of galaxies. I believe "citizen science" education programs, like GalaxyZoo, are going to make important contributions to the advancement of science in the future—especially given that the amount of data many new science missions will generate will far exceed what our science community has traditionally been able to examine.

Why Do People Become Galaxy Zoo Volunteers?

Jordan Raddick, Johns Hopkins University

Galaxy Zoo is a "citizen science" website that allows members of the public to contribute to publishable scientific research by classifying never before identified galaxies as spiral or elliptical. When we started Galaxy Zoo in July 2007, we didn't know how well it would work. It worked beyond our wildest dreams. Within a day after we first advertised the site on BBC News, more than 35,000 volunteers had joined. Today, the number of volunteers is over 220,000. Galaxy Zoo has so far resulted in 10 published papers, with another 6 accepted for publication.

As soon as we saw the success of Galaxy Zoo, the entire Galaxy Zoo team knew that we had created something with tremendous appeal to the public, and we wanted to know exactly what interests we were appealing to. Working with my colleagues Pamela Gay and Georgia Bracey from Southern Illinois University Edwardsville, we designed a study to identify Galaxy Zoo volunteers' motivations for participating in the project. After seeking advice from a number of people both within and outside of the AER community, we settled on a plan. First, we did a series of twelve interviews with Galaxy Zoo volunteers to better understand how they would describe their motivations in their own words. Then, the three of us independently read through the interview transcripts to identify common themes—or reasons why people volunteer to classify galaxies on Galaxy Zoo—within the interview participants' responses. From this analysis of the interview transcriptions twelve different "motivations" were identified. We then used these twelve motivations to analyze the interviews of twelve new volunteers and 826 Galaxy Zoo forum posts, adding to the reliability of our classification system. The 12 motivation categories are shown in Table 1.

The goal of conducting and analyzing the initial interviews was to uncover the set of common motivation categories present in the volunteer population, not to assess the frequency with which these motivations exist in the greater Galaxy Zoo community. To achieve that quantitative goal, we created an online survey. The survey asks for demographic information—gender, age, and education level—as well as motivation questions. We got a total of 11,729 responses to the survey; after cleaning the dataset to remove duplicate responses and other errors, we were left with 11,072 responses.

We have discovered that about 80 percent of Galaxy Zoo volunteers are male. Twenty-five percent of volunteers are

Motivation Category	Description (used in survey instrument)
Contribute	I am excited to contribute to original scientific research.
Learning	I find the site and forums helpful in learning about astronomy.
Discovery	I can look at galaxies that few people have seen before.
Community	I can meet other people with similar interests.
Teaching	I find Galaxy Zoo to be a useful resource for teaching other people.
Beauty	I enjoy looking at the beautiful galaxy images.
Fun	I had a lot of fun categorizing the galaxies.
Vastness	I am amazed by the vast scale of the universe.
Helping	I am happy to help.
Zoo	I am interested in the Galaxy Zoo project.
Astronomy	I am interested in astronomy.
Science	I am interested in science.

Table 1. Categories of motivation found among online volunteers in Galaxy Zoo. "Motivation Category" is the name that the research team uses to refer to the motivation, and "Description" is the statement that volunteers saw in the survey instrument.

ages 18 to 32; while only nine percent are ages 73 and above; these results closely match the overall percentage of the U.S. adult online population. Volunteers come from more than 100 different countries, with the majority (64%) coming from either the U.S. or the U.K.

The distribution of the motivation categories provided by the 11,072 Galaxy Zoo volunteers' is shown in the pie chart in Figure 1. The number one motivation by far—with 40% of survey responses—is "I am excited to contribute to original scientific research." This "Contribute" motivation is number one among both men and women, among all age groups, and among all education levels. A paper describing our interviews and motivation categories has been accepted in Astronomy Education Review, and we are now preparing a paper announcing the on-line survey results.

These results clearly show that at least some members of the public have a great desire to participate in scientific research. The next step in our research is to examine the motivations of people who go further in Galaxy Zoo, such as independently investigating problems they are interested in, and even making discoveries, using tools from the Sloan Digital Sky Survey. The public enthusiasm for participating in science is a tremendous resource for conducting scientific research and science education in the 21st century.

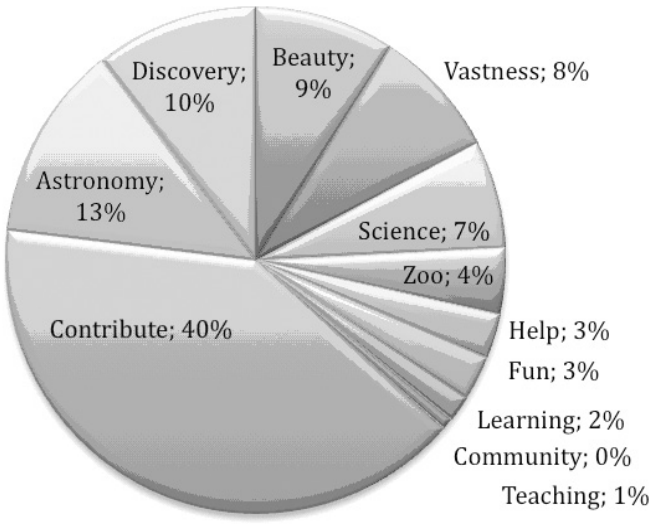

Figure 1. Motivations of Galaxy Zoo volunteers. The legend at the right shows the color coding of the motivations; the motivations themselves are listed in Table 1.

Community Building

Columnist: Gina Brissenden, Univ. of Arizona

In our last issue of *Spark*, Community Building featured an article form Paul Robinson (Westchester Community College) about the online community Astrolrner@CAE (astronomy101.jpl.nasa.gov/astrolrner/). And, as a member of this community, I have really appreciated the mentorship this community provides for it members—especially the openness and honesty with which people share their successes and failures teaching Astro 101 so that we can all become better instructors.

The community we're focusing on in this issue of *Spark* is actually our entire community—the astronomical community. Each community has its own "acceptable" practices, expectations, and language—even astronomy. And one aspect of becoming part of our greater community of astronomers involves learning this common language, and how to communicate with it, within the norms of our acceptable practises and expectations. So how is it we develop the language, and how to communicate with it, when not all of norms are made explicit? In our feature article, we hear from Audra Baleisis (Swiss Federal Institute of Technology), who will shed some light on this.

I especially hope that those of us who teach graduate courses, mentor graduate students, or are in charge of running departmental journal clubs or colloquia, pay special attention to this article. I think we'll all gain important insight about nurturing our next generation of astronomers and helping them become a part of their community.

And now, here's Audra!

"There's No Such Thing as a Stupid Question": Why a Single Phrase Doesn't Get More Students Speaking Up

Audra Baleisis, Swiss Federal Institute of Technology

This article is based on a qualitative study of the values and norms of academic astronomy (Baleisis, 2009). I was interested in what graduate students learn about the culture of astronomy from their experiences giving talks and asking questions at departmental speaking events. This work uncovered a number of conflicts between official, explicit norms for speaking and implicit norms, which influenced behavior but remained unacknowledged.

I interviewed PhD students and faculty members in a single astronomy department about various departmental speaking events like coffee hour, Journal Club, and Colloquium. Many of these events are intended to teach students to speak and think correctly about astronomy research, which means they highlight what it means to speak like, and be, an astronomer (Shulman, 2005).

According to my interviewees, the official goals of these events included having a lively, informal discussion among all participants (especially graduate students), and helping graduate students learn and practice their science speaking and reasoning skills. However, these same people's actual experiences of a Journal Club or coffee hour showed that these goals were not often achieved.

First, meaningful feedback for students on their verbal performances was lacking. Next, faculty members rarely explained to students how they dealt with the complex rules of giving talks and asking questions. Finally, there was the pervasive, but unacknowledged, practice of judging others' speech performance to come to negative conclusions about those individuals' intentions, intellectual abilities, or efforts. There was significant student anxiety about giving a talk or asking a question during a talk. While some of the students' anxiety may be attributable to personal anxiety, there was a component that was related to the structure and realization

of the speaking events. Structural anxiety arises in situations where judgment of a speaker is (1) ambiguous, and (2) consequential to that speaker (Shulman & Silver, 2005).

Ambiguous judgment often came up in interviewee statements. Students said they were usually only told "good talk" as the extent of faculty feedback. Faculty interviewees had difficulty expressing an objective list of criteria on how they judged student speaking. At the same time, they described a complex process of decision-making related to whether or not they asked a question at a talk or a Colloquium, heavily dependent on context, audience make-up, etc. Apart from advice about surface features of giving talks (for example, not making slides too busy) students got few explicit guidelines for how to give a successful talk or ask a good question. A lucky student might get this type of mentoring from her or his advisor, but it was not part of the typical education all students received.

But what about the consequence of these events? Students were not being graded or officially evaluated for future employment in most of these events. Studies of academic speaking (Tracy & Muller, 1994) highlight its impact on a speaker's intellectual reputation. For my interviewees, anxiety about speaking was related to "looking stupid," whether by asking a "stupid question," or not knowing something that everyone else in the room knew.

Research (Dweck, 2007) concerning the effects of beliefs about intelligence on individual behaviors in academic tasks presents two competing models of individual intelligence: (1) as in-born and fixed, or (2) as malleable, and able to increase through learning and effort. People who believe in the first model tend to hide their intellectual effort because it might betray lower intelligence than other people or that required by some task, and worry more about how intelligent they appear to others. They avoid situations where they might be seen making mistakes. This belief seemed pervasive among both faculty and students in my study. For instance, students worried that their knowledge would be "out on the table" if they were to speak up. In contrast, people who believe in the second model (which is consistent with research on how human beings actually learn and how the brain works) tend to look for opportunities to try and fail and learn in the process, and are more concerned with the effort they have expended in improving their performance than with how smart they look. Unfortunately, the structure of academic speaking events seems to reinforce the beliefs (and resultant low student participation) of a fixed intelligence model. Although a statement like "there's no such thing as a stupid question" is consistent with a belief that learning is more important than looking smart, it cannot change behavior if a host of other verbal cues and behaviors of students, postdocs and faculty contradict it.

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Shulman, L. S. (2005) Signature pedagogies in the professions. Daedalus, Summer 2005, 52-59.

Shulman, D. & Silver, I. (2005) Demystifying the hidden magic of producing sociologists. The American Sociologist, Summer 2005, 5-10.

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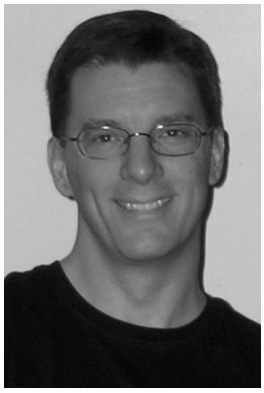
Meaningful Course Revision: Enhancing Academic Engagement Using Student Learning Data

By Catherine M. Wehlburg, Anker Publishing (2006), ISBN 978-1-933371-05-4; $38



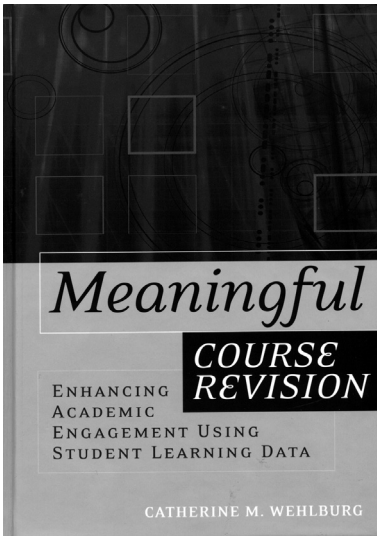
Jeffrey J. Sudol, Reviewer
West Chester Univ.

How do you know what you are doing in the classroom is effective? If it isn't effective, how do you go about changing what you do? In *Meaningful Course Revision: Enhancing Academic Engagement Using Student Learning Data*, Dr. Catherine M. Wehlburg advocates data driven decision making in course revision. She writes, "After more than a decade as a faculty member and many years of working with faculty, I am convinced that many of the course changes that faculty make are based on reasons other than data, such as intuition or single student comments (p. VIII)." In this book, Wehlburg outlines the standard paradigm for course development in education: prescribe goals and learning objectives for the course, build student-centered activities around the goals and objectives, create assessment tools that are aligned with the goals and objectives and that provide students with appropriate practice, then use the data from the assessments to determine whether or not the goals and objectives have been met. If this paradigm is unfamiliar to you, this book might be a good starting point. If, however, you are familiar with this paradigm, I expect that the research literature and other books on the market will be of greater value to you in your efforts to improve your courses.

Wehlburg covers a great deal of content, such as student evaluations, methods of assessment (including some standards such as the minute paper, the muddiest point, and just-in-time teaching), student-centered teaching (including wait-time, misconceptions, cognitive dissonance, transfer, and metacognition), specific student-centered teaching techniques (including guided reciprocal questioning, case studies, discussion portfolios, and think-pair-share questions, but lecture tutorials, for example, receive no mention), and grading policies and procedures (grading rubrics, norm-referenced vs. performance based grading, and formative assessment vs. summative assessment vs. authentic assessment), all in the context of course revision. In the final chapters of the book, Wehlburg addresses department level and university level assessment and curriculum revision. Unfortunately, this breadth of coverage comes with a lack of depth, and the author tends to advocate positions more so than argue for them and outline techniques more so than explain them in detail.

Often, Wehlburg lapses into admin-speak, lofty, but lacking substance. For example, "Knowing what should be modified in a course in order to enhance student engagement and student learning will enable you to make the best possible course decisions (p.25)." At times, the author is glib, "By incorporating team learning and group work into your class, you are engaging students in collaborative ways with each other and with the material (p.31)." The book is not particularly inspiring. Few examples are given, and those that are given are of a particularly weak form. In general, references to the research literature are rare. In particular, the section on classroom discussion makes no reference to the research at all, and the advice given at times is uninformed by research. With regard to class discussion, for example, Wehlburg writes, "Perhaps, based on what you hear from students during the discussion, you decide that they need more background information. In this case, you could send them information via email, hand out additional information in the next class period, or choose to explain information that was already given (p.80)."

Notably absent from the book is any discussion of multiple-choice question stems, distracters, and the biserial-r test. For faculty who teach larger lecture classes, multiple-choice exams are a necessity, and the biserial-r test is an excellent means to determine whether or not instruction is effective or a particular question is broken.



I must caution anyone who might choose to read this book to not expect more than advocacy and outline. If you want clear examples and the nuts and bolts about how to actually go about improving your course, you must look elsewhere.

News from the Astronomical Society of the Pacific: ASP Web Pages Give Real Scoop on "Doomsday 2012"

Will Doomsday come in 2012? A widespread Internet-circulated story claims that 21 Dec. 2012 will be the end for planet Earth because some astronomical event, allegedly predicted by the ending of a Mayan calendar cycle, will destroy or decimate our planet. Your students or neighbors may be asking you about this. NASA's David Morrison has put together a concise summary of the claims and the scientific response at the ASP web site:
http://www.astrosociety.org/2012

Many mechanisms for doomsday are being proposed, including a collision with a fictional planet called Nibiru, deadly activity on the surface of the Sun that lashes out at Earth, alignments with the center of our galaxy, and so on. Morrison has coined the term "cosmophobia":—fear of the cosmos—for these public concerns. Morrison serves as the public scientist for NASA's "Ask an Astrobiologist" service, where he answers questions for the public. He has received so many questions about 2012 and the end of the world that he felt he had to investigate and set the record straight.

One of his most interesting findings is that the doomsday notion seems to be getting strong play right now as a result of the viral marketing campaign by distributors of the science fiction motion picture "2012". Their campaign includes setting up a web site for a fictitious organization and encouraging people to search for "2012" on the Web.

Morrison's article is in the form of questions and answers, and is followed by a resource guide that allows readers to find even more scientific information about why no 2012 disaster is in the cards. For an annotated guide of resources for responding to many claims of astronomical pseudo-science, from astrology to crop circles, and ancient astronauts to Moon-landing denial, see:

http://www.astrosociety.org/education/resources/pseudobib.html

Web 2.0 and Astronomy Education

Columnist: Pamela Gay, Southern Illinois University Edwardsville

Once upon a time, in a computer lab not so far away, I remember sitting with a room full of students plowing through exercises using digital planetarium software. In those early days of Redshift and Voyager, many of us wrote simple activities based around "Where was the Sun on your birthday?" and, of course, "How does the sunset position change over time?" We used our digital planetarium software to do one simple thing: Replicate the sky and allow us to do the observational labs that the light pollution in the real sky, weather, and constraints of time didn't allow.

Today, software for exploring the sky takes many new forms, and I have at my disposal a suite of new desktop planetarium software that includes: Redshift, Voyager, Stellarium, The Sky, Celestia, and more. These new and updated tools bring us catalogues of data detailed images, and the ability to turn on and off layers of content. These tools are great, but two new software ideas bend our old notion of desktop planetarium software in whole new directions.

Both Google's Google Sky and Microsoft's WorldWide Telescope create a digital shared sky where people can, in very different ways, share and explore data. Google Sky is built in a way that makes it easy for people to build layers of information that include interactive html windows of content. This information appears as a series of markers in Google Sky, and users can see the sky as a community of meta data markers tracing out some of the most interesting and out of the world offerings in the celestial sphere. Google Sky is defiantly a social place for sharing. That said, it is not planetarium software and it does not provide graphically stunning views. If you want to share and be social though, this is the best new toy on the Internets.

continued on next page

Web 2.0 continued

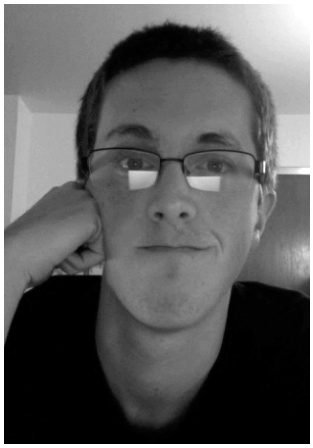
Microsoft's WorldWide Telescope (WWT), which is discussed more in the accompanying article by Jarod Luebbert and Mark Sands, takes a completely different take and works to be an educational and research tool. Within its interface, WWT includes data spanning many wavelengths. By itself, this is simply a nice feature, but Microsoft makes it a powerful feature, however, by making it easy for users to call up data across all these wavelengths just by clicking on objects. This simple feature makes WWT a tool for data mining.

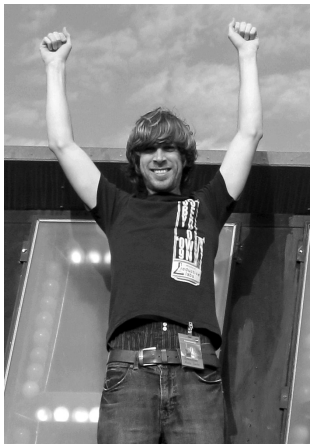
Today, if I were to take my students into a lab, my activities could look very different. Simple tasks become much richer, for instance I can now ask students to explain why all galaxies are classified based on B images after looking at spirals in ultraviolet, visible, and infrared light, and I can have a rich discussion of the Sun's motion by looking at the Doppler shift in WMAP images. Our modern understanding is tied to multi-wavelength data and now I can easily tie my students' understanding to activities based on that same data.

Good planetarium software will always have its place in the classroom, but next time you revise your syllabus and consider marching your students to the computer lab, I'd ask you to check out these new tools we have in our astronomy educational arsenal.

Exploring a Digital Sky: Tools to extend WorldWide Telescope into Galaxy Zoo and Wordpress

Jarod Luebbert and Mark Sands, Southern Illinois University Edwardsville





WorldWide Telescope (WWT) is a tool that offers a feature-rich environment while allowing you to do a lot with the fundamentals. One of the most powerful features that WorldWide Telescope offers is the ability to create interactive tours. These guided tours are a way to take someone on *your* journey through the Universe. The valuable thing about tours is that you can pause the tour at any moment to explore on your own and resume the tour once you are done. For the past year, our team has been working to build software mashups to unite WorldWide Telescope with the popular blog software Wordpress and, separately, with the citizen science website Galaxy Zoo. By combining WWT with these two existing interfaces, we hope to make it easier for educators and bloggers to teach astronomy and encourage people to explore the sky.

The WorldWide Telescope, a product of Microsoft Research, offers users a chance to explore the sky in multiple wavelengths and to even zoom in on planetary surfaces. The WWT includes image data from a range of sky-surveys including WMAP, 2MASS, SDSS, GALEX, ROSAT and Swift. Users can switch which survey is used to see the sky. Beyond just looking at images, users can also explore the data: by clicking on objects, users can pull up details and access the data through linked in tools such as the SkyServer associated with the SDSS. Encouraging users to explore was our primary motivation in creating these mashups.

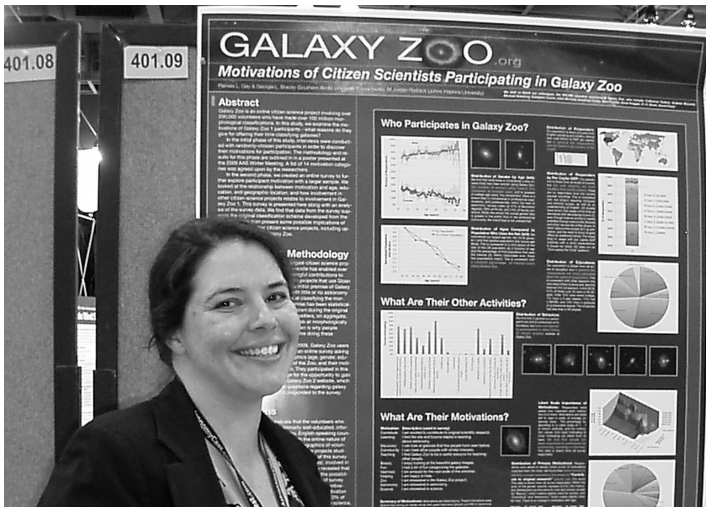
Through our WWT-Galaxy Zoo sky tour creation tool, users have the ability to take their favorite Galaxy Zoo objects and explore them at a new level. In Galaxy Zoo, users click through images of the Universe that few if any other eyes have seen. While classifying these galaxies, users often find beautiful images that they want to explore more or share with friends. Through Galaxy Zoo, users can mark these images as favorites and view them again later through their user profile. With our WWT-Galaxy Zoo sky tour creation tool, Galaxy Zoo users can select and order galaxies from their favorites for viewing in WWT. This tool than generates a file that can be opened in WorldWide Telescope, mailed to friends, or posted on the internet. This tool is available today to anyone using Galaxy Zoo.

Digital Sky continued

In addition to blending WWT and Galaxy Zoo, we've also worked to bring WWT into Wordpress. The integration of WWT and the popular blogging software Wordpress allows educators and amateur astronomers to introduce these virtual tours to their audiences so they can explore along the same paths through the sky in a fun and exciting way. Bloggers will find the Wordpress plugin simple and easy to use. The plugin features the added ability to add music or voice for their readers to follow along on their journey. By bringing readers into a virtual universe, with freedom to explore, we hope to show that the field of astronomy is not a difficult or scary place, but that it allows fun, exciting, and mysterious adventures that anyone can be part of. The Wordpress plugin is currently in beta release, and a full release is expected in February 2010.

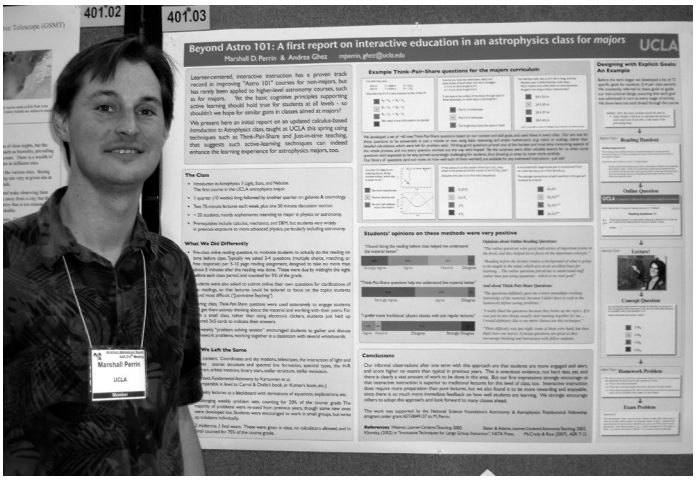
These two WWT mashups are just the tip of what is possible. Moving into the future, we see Galaxy Zoo users creating tours of specific kinds of galaxies—rings or mergers, for instance—that they wish to explore across the wavelengths. We also see our Wordpress plugin being used to create sky tours built around astronomy lectures and podcasts. What we have done is provide tools to make it easy to create new content. We now invite the users to mix in their creativity.

This work was funded through a gift from Microsoft Research and could not have been possible without the help of Jonathan Fay.



Above: Pamela Gay (Southern Illinois University Edwardsville) shares data on the Galaxy Zoo study Jordan talks about in his feature Spark article

Below: Marshall Perrin & Andrea Ghez (Andrea's in the pic on the poster; UCLA) show us that interactive instruction isn't just for non-science majors.



AAS Education Meeting Schedule - Washington, DC

215th Meeting of the AAS; 2-7 January 2010

SATURDAY, 2 January 2010

- CAE Astro 101 Teaching Excellence Workshop, Day 1 of 2
  Virginia Rm. A & B; 9:00am-5:00pm

- AstroZone: Washington, DC
  National Zoo: Amazonia Exhibit Building;
  12:00pm-4:00pm

SUNDAY, 3 January 2010

Workshops

- CAE/CATS Using Technology in the Astro 101 Classroom
  Wilson Rm. C; 8:00am-5:00pm

- CAE Astro 101 Teaching Excellence Workshop, Day 2 of 2
  Virginia Rm. A & B; 9:00am-5:00pm

- Building on IYA: The Galileoscope Program
  Marriott Ballroom Salon 3; 9:00am-12:00pm

- Getting Started in Astronomy Education Research
  Maryland Rm. C; 2:00pm-5:00pm

Social Events

- K-12 Educator Reception
  Marriott Ballroom Balcony A; 4:30pm-6:00pm

- Undergraduate Orientation
  Lobby Atrium; 6:00pm-7:00pm

- Opening Reception
  Thurgood Marshall Rm; 7:00pm-10:00pm

MONDAY, 4 January 2010

Special Session

- 201: Employment in Astronomy: Present and Future
  Deleware Rm. A; 10:001m-11:30am

- 208: Longitudinal Study of Astronomy Graduate Students
  Virginia Rm. B; 2:00pm-3:30pm

TUESDAY, 5 January 2010

Oral & Special Sessions

- 210: IYA2009 and Beyond:
  Global Overview and Cornerstone Projects
  Maryland Rm. A; 10:00am-11:30am

- 215: IYA2009 and Beyond:
  Outreach and Citizen Science Programs
  Maryland Rm. A; 2:00pm-3:30pm

- 217: Using Cognitive Science to Enhance Astronomy Teaching
  Delaware Rm. A; 2:00pm-3:30pm

Poster Sessions (Exhibit Hall; 9:20am-6:30pm)

- 444: IYA 2009

- 445: Outreach for Diverse Audiences & Venues

- 446: Connecting with K-12 Students & Teachers

- 447: The Collaboration of Astronomy Teaching Scholars (CATS) Program

WEDNESDAY, 6 January 2010

- Invited Talk 110: John Grunsfeld, Shuttle Atlantis
  Marriott Ballroom; 8:30am-9:20am

Oral & Special Sessions

- 352: Innovations in Teaching & Learning I
  Maryland Rm. B; 10:00am-11:30am

- 221: Mentoring Astronomers: Students to Faculty I
  Maryland Rm. A; 10:00am-11:30am

- 366: New Insights from Education Research
  Maryland Rm. B; 2:00pm-3:30pm

- 226: Mentoring Astronomers: Students to Faculty II
  Maryland Rm. A; 2:00pm-3:30pm

Poster Sessions (Exhibit Hall; 9:20am-6:30pm)

- 465: NASA EPO: Bringing Space Down to Earth

- 466: Tools & Techniques for University Astronomy

- 467: Citizen Science & Student Research

- 468: New Media and the Universe Online

Social Events

- CAE/AAE Educators Townhall Reception
  Marriott Ballroom Balcony Rms. C & D
  5:30pm-7:00pm

- Graduate Student Networking Event
  Lobby Atrium; 6:00pm-7:00pm

- Society Banquet
  National Air & Space Museum; 7:00pm-9:00pm

- BLAST! the Movie Screening
  Thurgood Marshall North; 7:00pm-9:00pm

THURSDAY, 7 January 2010

- Oral Session 379: Innovations in Teaching & Learning II
  Maryland Rm. B; 10:00am-11:30am

- Poster Session 600: Education and Outreach
  Exhibit Hall; 9:20am-1:00pm