

1-1-2012

## Arkansas Physics Times, January 2012

Society of Physics Students (American Institute of Physics)

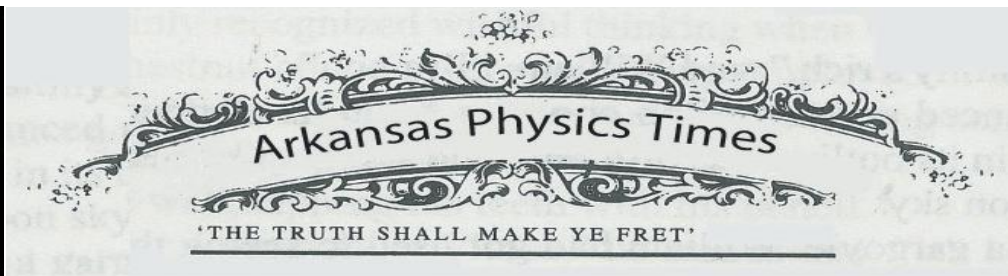
Follow this and additional works at: <https://scholarworks.uark.edu/arkansas-physics-times>

---

### Citation

Society of Physics Students (American Institute of Physics). (2012). Arkansas Physics Times, January 2012. *Arkansas Physics Times*. Retrieved from <https://scholarworks.uark.edu/arkansas-physics-times/12>

This Periodical is brought to you for free and open access by the Physics at ScholarWorks@UARK. It has been accepted for inclusion in Arkansas Physics Times by an authorized administrator of ScholarWorks@UARK. For more information, please contact [ccmiddle@uark.edu](mailto:ccmiddle@uark.edu).



## Life after College: Now What? ✨

Aisha Mahmoud

As the ever lingering dark cloud of graduation looms over us, we find ourselves facing the all too relevant question—what will you do with the rest of your life? It’s never too early to start planning. However, as a senior student, it seems particularly pressing that my fellow classmates and I make a plan. The fact is a lot of us still have doubts about where we want to be after college, what we want to accomplish, and what our “calling” in life is. The most common decision my peers and I face is the battle between enrolling in graduate school and starting a career. Do we continue our scholarly quests? Or do we let experience in the professional world guide us through our next years?

**Tips:** Get an internship; even if it isn’t exactly the field you want, having at least one professional experience to talk about in interviews will help tremendously. Start the job search early, two semesters may feel like a long time, but many companies do hiring for the fall a year ahead of time. Use your resources, whether school connections or personal networking don’t be afraid to contact people!

### Individual Highlights:

After College	Page 1, 2
Machine Shop	Page 3
Hindsight	Page 4
REU’s	Page 5
Haunted Lab	Page 6
Celebrating	Page 7
Right-Brained	Page 8
Fun Page	Page 9

**The career path:** Many of us will decide to enter the working world as young professionals with a cutting-edge take on analytical practices. At least we’ll try. Try as they might, classes don’t give you the actual experience of the working world and that experience can only be achieved by the good old nine to five.



### The graduate school path:

Many students are lucky enough to find a subject they want to pursue further. In this case there are many advantages to graduate education aside from continuing the party of college. Once you find your niche in the academic world, grad school is a great way to continue your learning in that area. And as always, education is never wasted. Grad school programs are generally smaller and they will place you with other people who are passionate about your specific area. Grad school also requires a lot of time and sacrifice, and I quote from a close friend of



## Second Star to the Right V. V. ✨

mine currently getting his PhD in astronomy in Michigan “graduate school will introduce you to hell.” Good luck!

**Tips:** Although the old adage “C’s get degrees” may work for some, a competitive GPA and research experience can give you leverage to bargain for funding and scholarships in graduate school. Take the GREs as soon as you can, even if you plan on taking a year off before grad school it’s a lot easier to study for the GRE when you are still in an academic mind set. It might seem obvious but for grad school it becomes even more important to research the programs you apply to as they vary so much from school to school. Also, REUs, REUs, REUs, REUs, research, research, research, research—get it? It’s important.



**The alternative path:** I feel it would be an injustice not to discuss the popular alternative to the traditional post-college life—the road less traveled. Something I love about our generation is how willing we are to leave everything we know in pursuit of the great unknown. Traveling can be a fulfilling and

educational experience. However, despite its romantic reputation, it does not come without hard work. Some great organizations to help your travels also have purpose like WWOOF, an organic farming exchange program; Bike & Build, which allows participants to build affordable housing while biking around the country; and ETS, which offers opportunities for Americans to teach English around the world. I am actually following this path next year after graduation. I have been selected by the Ministry of Education of the United States to be a cultural ambassador in Andalucía, Spain from mid 2012 to late 2013. My job will consist of teaching Spaniards not only about the English language, but also about American culture in order to create long-lasting and healthy bonds between Americans and the people of Spain.

**Tips:** Give it a lot of thought. It is an ENTIRE year. Make sure to do something productive. Check your finances. You’ll need money for plane tickets, food, visas and more. Compare salaries between the different programs—unfortunately, abroad, money really matters. But, remember to KEEP CALM AND TRAVEL ON!



Aisha in the Wadi Rum desert in south Jordan.

image sources: nj.com, ets.com, pack-your-passport.com

## *Second Star to the Right V. V. ✨*

### *The Machine Shop in the Basement*

*Jennifer Stabach*

At the beginning of the semester, I noticed a small flyer in the Physics building advertising a Machine Shop course for students. I didn't have an immediate need to take this class, but I knew that machining skills might come in handy later. Plus, working with power tools is always fun!



In the basement of the Physics building (I didn't even know there was a basement), I found a whole room of machining equipment, along with every tool you can think of. Believe me, this isn't just your parent's workshop -- unless your parents have industrial-grade machines capable of cutting through stainless steel.

The machine shop has a milling machine so large that I have to stand on a stool to be able to reach the top of it. There's also a massive lathe, drill presses, belt sanders, and a bandsaw. Even if you have no idea what these machine do (I didn't), you have the opportunity to use them all if you take the course.

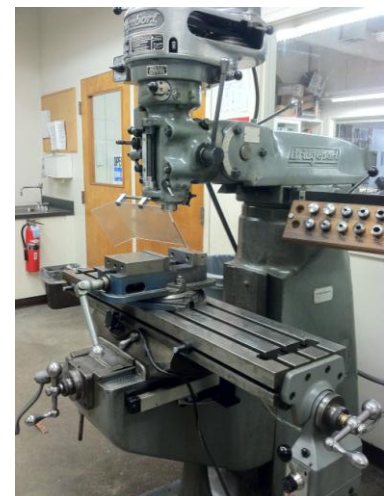
Brandon Rogers, the shop's Machinist for 12 ½ years, teaches the Machine Shop course once per semester and summer. He allows two groups of five or six students

to sign up each time the course is offered. The groups meet for about one hour, two times per week.

The course is completely hands-on. First, Brandon demonstrates how to use a machine, and then he supervises each student as they complete individual projects. If you're nervous about using the equipment, don't be. The course starts with the basics, such as drilling a hole with a drill press and cutting a piece of metal with the bandsaw. The course advances in difficulty, and by the end, students independently build an optics post holder and base out of aluminum.

Any student at the University may enroll in the Machine Shop course, though it's usually taken by Physics graduate and undergraduate students. As an added bonus, it's offered at no cost to students!

Upon completion of the course, Physics students are given a key to shop, meaning they may use it at any time for school or personal projects. So, whether you are building a device for research or working on a motorcycle part, you are always welcome back.



*Hindsight has no Aberrations**Edward Jenner*

This past spring I spent abroad at the University of Newcastle, New South Wales, Australia. While there, I attended a modern optics course. Meeting only for two hours of lecture a week, with four hours of lab, and only five students, it was clear that this course was out of the norm.

Over the semester, students in the optics class became my closest friends. We were all like-minded physics students with a similar slap-happy sense of humor.

The lectures were straight forward as far as the way they were presented. Notes were sent out before the lecture, nobody would read them, and we'd go into class unprepared and try to follow our benevolent professor. The labs, on the other hand, were a cacophony of confusion unlike anything I'd ever had the fortune of dealing with. Up until that point, the only physics courses I had taken were UPI and UPII, so I went in with the impression that labs would be laid out very clearly with moderately working and at least safe equipment. Faulty equipment was the mainstay of the lab proceedings. From spending three hours counting diffraction fringes to toiling away trying to couple a 50 $\mu$ m optical fiber, nothing was ever finished on time.

The only lab to go completely as planned, and also prove to be my favorite, was the holography lab. Aside from the fact that we were getting to create an actual hologram, the whole experiment was conducted in a dark box, to

protect the plates. I had to run through the entire process without seeing what I was doing, and felt around for the correct parts while mentally keeping track how everything was aligned.

The finale to the entire course was a suiting end to optics. It was a cold and rainy June day. The jockeys had just brought the horses back into their stables as the optics, constitutional law, and cell biology classes all got seated for our finals. Although initially confused, later at the pub my class mates explain to me that the finals are located off campus (and in this situation, at a race track) to keep students away from campus. This prevents students from hiding notes in the building of the test. Also, because they have private contractors proctor the test, it saves the university money to put more than one class's final in the same room.



Looking back, I'd definitely take the class again. The professor was very nice, with a wonderful sense of humor. The classmates were by far the best I'd ever had, and the labs, though rigorous and tedious, challenged me on a technical level I hadn't encountered before. I would strongly encourage any prospective exchange students to challenge themselves fully in their courses. They pay offs are well worth the effort.

## Research Experience for Undergraduates

*Dr. John Stewart*

Each summer many physics programs across the country offer Research Experiences for Undergraduates (REU) programs that pay undergraduate physics and engineering majors to live at another university and to participate in research. These programs are an excellent way to preview a graduate school and to get your foot in the door at a graduate school. These

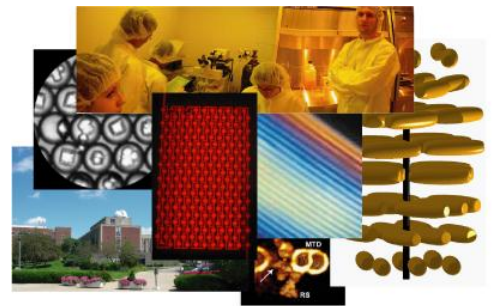


programs pay you to attend and most students come home with more money than when they left. These programs are normally attended in the summer after the junior year, but some advanced sophomores have been accepted. Application deadlines begin in January and run until April. To find more information about applying to REU programs visit the SPS wiki at [http://www.uark.edu/depts/physinfo/wiki/index.php?title=Portal:REU\\_Applications](http://www.uark.edu/depts/physinfo/wiki/index.php?title=Portal:REU_Applications).

Last summer a number of physics majors attended REU programs. They spoke at a departmental



colloquium at the beginning of the fall semester. Thomas Rembert spoke about his research at MIT on Modeling the Response of Superconducting Nanowire Single-Photon Detectors with COMSOL. AJ Salois talked about her experience at the Smithsonian, National Air and Space Museum on Education at the Museum Level. Aisha Mahmoud spoke about her research at the Goddard Space Flight Center. Tom Ivanoff talked about his research at the University of Nebraska on determining the properties of switch grass through nano-indentation. Andrew Bobel talked about his work at Cornell on Epitaxial Growth of  $\text{SrVO}_3/\text{CaVO}_3$  superlattices. Thomas, Tom, and Andrew are all applying to the institutions where they did REUs for graduate school.



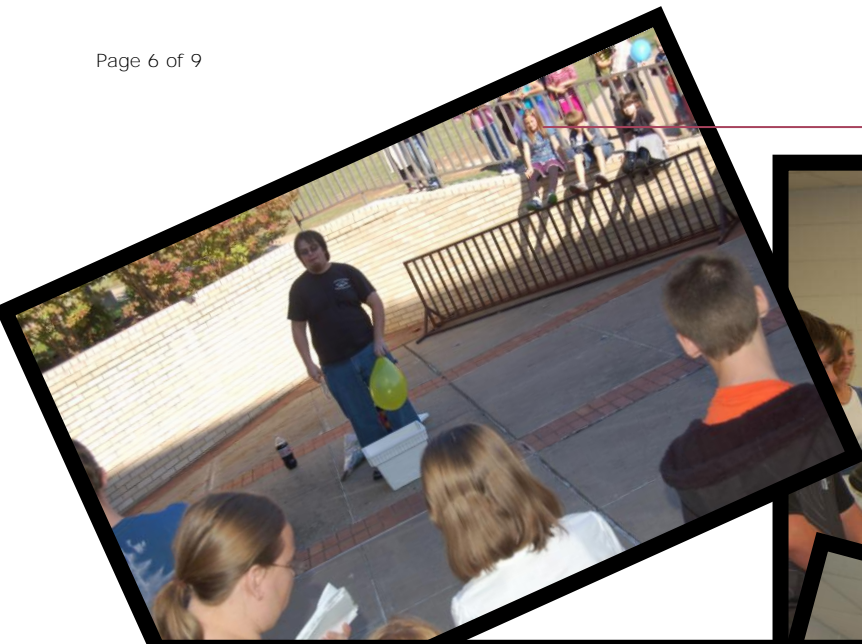
I strongly encourage all students planning graduate school in physics or engineering to apply to an REU program before the end of their junior year.

Image credit:

[http://www.lehigh.edu/imi/images/REU%20Photos/REU2011\\_Patrick\\_Clare\\_Lab.jpg](http://www.lehigh.edu/imi/images/REU%20Photos/REU2011_Patrick_Clare_Lab.jpg)

[http://ifa.hawaii.edu/newsletters/images/40REU\\_students.jpg](http://ifa.hawaii.edu/newsletters/images/40REU_students.jpg)

<http://www.brandeis.edu/mrsec/research/images/REU.jpg>



*Haunted  
Lab*

### Celebrating Discovery

*AJ Salois*

Been back to your old high school lately? Make a visit to see old friends and even add to your résumé while you're there! The "Celebrating Discovery" program encourages students to visit their alma maters and speak about their college experiences. Rani Achhireddy in the Honors Colleges defines it as, "...a program that gives undergraduate students the opportunity to travel to their hometown to present their research or study abroad experience to high school students." Did you know that all this neat stuff existed while you were in high school? If you didn't, you can change that for other students. Talk about what you've done with others!

I've had a lot of fun with this program. During winter or summer break I'll visit good ol' Granbury High School and speak with the physics classes. The way to do this is first by speaking with an old teacher or contacting the principle. Watch out for spam collectors. I kept getting caught in the principle's until I wrote to an old teacher through facebook.

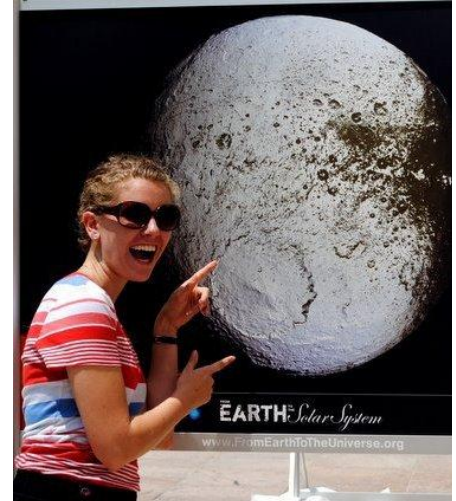
Next, make up your presentation. Don't include anything too technical because you'll just get blanks stares like I did the first time. I like to include the basic outline of my research project with some key words that the students will recognize. If they've heard it before they're more likely to listen to the rest! Checking in with their teacher can be really helpful. When I heard that the students had just learned about waves I focused for an extra minute on how astronomer's can study objects in other wavelengths beside visual. I explained the way pretty astronomical pictures are made. This drummed up a lot of questions for me.

I also recommend throwing in a slide or two about all the fun stuff! For my last slide during these talks I include a

slide with automatic effects to create a slideshow effect. I click and pictures of my travels flash by to solidify the kids interest. They see pictures of mountains, stars, sandboarding, hiking, and even seals on the Chilean coast. Point out that college & research is about the entire experience not just the hard work.

For many speaking in front of a bunch of high school students is the epitome of worst nightmares (don't forget to dress before leaving the house!) However, the high school students are really not all that bad. I assure you they may not be more afraid of you than you are of them, but once you throw out the first few sentences of your presentation they'll definitely be in awe of you!

Have fun with it! Don't take yourself too seriously and everything will be just fine. One last hint; it's always a good idea to joke right back at the kids. Make it fun for everybody. Remember, this is a day off of school work for them!



If you would like more information about the program contact Maribeth Lynes at [mlynes@uark.edu](mailto:mlynes@uark.edu) about "Celebrating Discovery." A powerpoint template is also available for your use if you request it. Best of luck!



## Second Star to the Right V. V

### Right-Brained Physics

**Good Morning, Moon**  
By: AJ Salois

Good morning, Moon  
Such a pleasant surprise  
seeing your open face  
suspended up there.

Pale blue bright and staring  
down at all us little things.  
What a sight we must make.  
I could stand in the middle

Of New York, central. Look  
up at the big video screens and  
all those bright shining lights,  
they're pretty distracting.

And there you are, Moon  
hanging on the other side  
of us and the sun, lounging  
at the top of the skyscraper.

You're just that inconspicuous  
blue and white circle, missing  
a chunk or two. Smiling big  
and beaming down at us

ignorant little sticks. We must  
be pretty funny, stiff at the joints,  
to your aged face with seas  
so many battle scar maria.

You saw us come with the  
curious men in the metal box.  
How much you giggled when  
they made one footprint a big

to-do. And it was all so serious!  
Houston, we have a problem.  
What a time you must have had  
watching us hold our breath.

Capture, Condensation, Collision,  
Fission or Ejected Ring theory?

Man in the Moon or Moon in  
the Man theory.

What a silly thought, Moon.  
What are you saying, Moon?

Caleb Heath introduces us to **David Morin**; a  
physicist at Harvard University and a poet.  
Below you will find three of his short physics-  
poems. More information may be found at:  
<http://www.physics.harvard.edu/people/facpages/morin.html>

Newton said as he gazed off afar,  
"From here to the most distant star,  
These wond'rous ellipses  
And solar eclipses  
All come from a 1 over r."

How Fermi could estimate things!  
Like the well-known Olympic ten rings,  
And the one-hundred states,  
And weeks with ten dates,  
And birds that all fly with one... wings.

A child looked up in the sky,  
And said, "It's so blue, Mom, but why?"  
Well, blue scatters more  
(There's this power of 4),  
So it rarely comes straight to your eye.

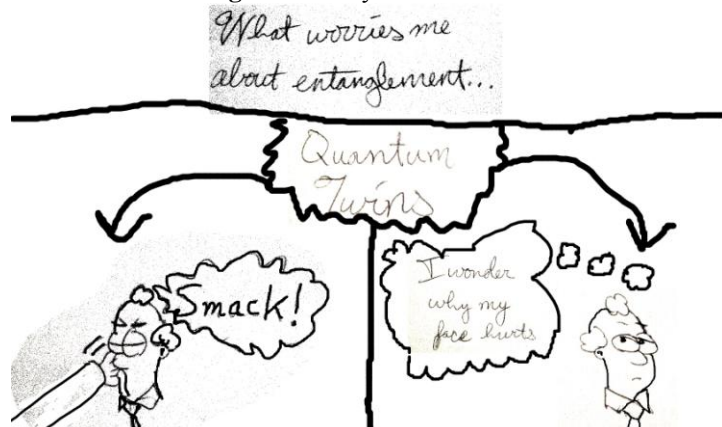
---

Joshua Bacon is studying physics (among  
other things) but he also writes comics!

**Resistance**  
By: Joshua Bacon

$$\frac{V}{I} = \text{Futile}$$

Arguments By: Joshua Bacon



Master Oudoku



VAPORS BE UNIT

12x12 Hidden Word Sudoku Puzzle  
Each row, column and 3x4 rectangle contains the letters in the word or phrase exactly once

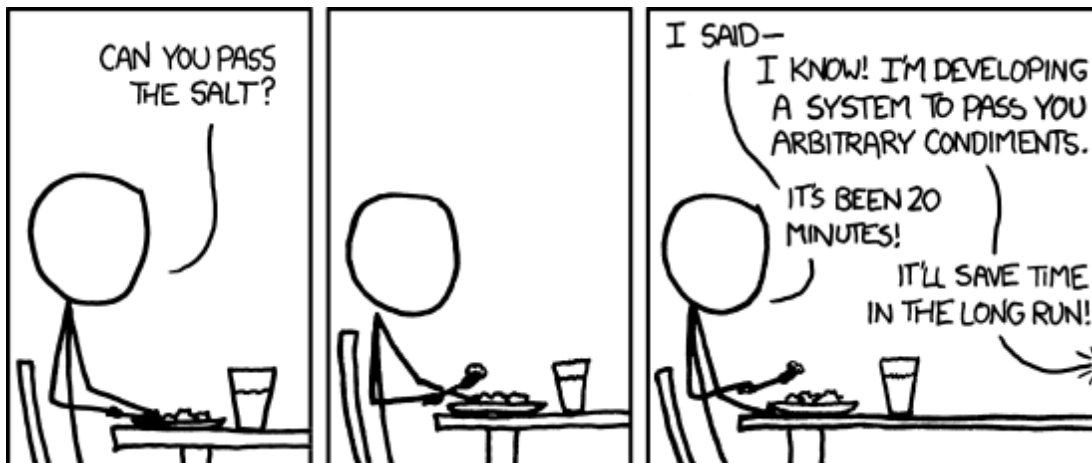
The hidden word or phrase is spelled down the diagonal

Puzzle provided by:

<http://magicwordsquare.blogspot.com/2011/12/sunday-challenge-new-word-sudoku-puzzle.html>

For answer see second puzzle:

<http://magicwordsquare.blogspot.com/2011/12/solution-to-sunday-challenge-word.html>



Credit: <http://xkcd.com/974/>

SPS Officers and Contact:

- President:** Thomas Rembert  
Email: [trembert@uark.edu](mailto:trembert@uark.edu)
- Vice President:** Derrek Wilson  
Email: [djwilson@uark.edu](mailto:djwilson@uark.edu)
- Treasurer:** Cameron Cook & Andrew Bobel  
Email: [ctcook@uark.edu](mailto:ctcook@uark.edu) & [abobel@uark.edu](mailto:abobel@uark.edu)
- Secretary:** Mark Bush  
Email: [mjbush@uark.edu](mailto:mjbush@uark.edu)
- Web Master:** Wes Clawson  
Email: [wclawson@uark.edu](mailto:wclawson@uark.edu)
- Fundraising:** Joshua Bacon  
Email: [bacon@uark.edu](mailto:bacon@uark.edu)

- Library Officer:** Matt Hartley  
Email: [mhartley@uark.edu](mailto:mhartley@uark.edu)
- Activities Coordinator:** Tom Ivanoff  
Email: [tivanoff@uark.edu](mailto:tivanoff@uark.edu)
- Outreach Coordinator:** Mathias Bellaiche & William Lewis  
Email: [mbellaic@uark.edu](mailto:mbellaic@uark.edu) & [welewis@uark.edu](mailto:welewis@uark.edu)
- Newspaper Editor:** AJ Salois  
Email: [asalois@uark.edu](mailto:asalois@uark.edu)
- Newspaper Reporters:** Aisha Mahmoud [axm029@uark.edu](mailto:axm029@uark.edu), Jennifer Stabach [jstabac@uark.edu](mailto:jstabac@uark.edu), Edward Jenner [ejenner@uark.edu](mailto:ejenner@uark.edu), Caleb Heath [clh028@uark.edu](mailto:clh028@uark.edu), Joshua Bacon [bacon@uark.edu](mailto:bacon@uark.edu)