

ASU Physics

PO Box 871504

Tempe, AZ 85287

<http://physics.asu.edu>

In the news...

Congratulations to Regents' Professor [David Smith](#) on being named a fellow of the Materials Research Society (MRS). The citation reads: "In recognition of outstanding contributions to the development, applications, and advancement of atomic-resolution electron microscopy, especially for the microstructural characterization of advanced materials."



[David Smith](#)

Smith has been at ASU since 1984 and a professor in ASU Physics for 15+ years. He's held numerous leadership roles including director of both the Center for High Resolution Electron Microscopy and the Center for Solid State Science as well as Associate Chair of ASU Physics. He was named Regents' Professor in 2000.

The recognition as MRS fellow will be formally presented at Spring Meeting of the Materials Research Society in April.

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ASU Physics Professor [Kong-Thon \(Frank\) Tsen's](#) research on selective disinfection is featured in the March issue of the journal *Nature Photonics*. The article explains how an ultra short

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The evolution of a Sun Devil

Long-time staff member reflects on 28 years of service

(On March 1, 2010, Timothy Cook officially retired from ASU. For nearly three decades, he supported science laboratories at ASU—briefly in the Department of Zoology and with ASU Physics since 1982. In 1995, Tim was promoted to Laboratory Manager and supervisor of the Physics Instructional Resource Team (PIRT). His service and performance have been remarkable. In celebration of his retirement, we asked Tim to contribute a reflection on his time at ASU. The following excerpt adapted from his essay (full text and more photos [HERE](#)) tells the story of the evolution of a Sun Devil...)

The Early Years

My association with ASU has been life-long. My father, Art Cook, was an ASU agriculture student and worked on the ASU farm as a student and then as a staff member as Dairy Herdsman and Assistant Superintendent. He retired in 1990 after 38 years. I grew up on the ASU Farms, first southwest of Broadway & Mill in Tempe and then relocated to Price & Elliott which is now the ASU Research Park. Out house was just north of where the Macro Technology Works now stands.

I attended Marcos de Niza High school in Tempe and grew to love physics studying under Malcolm Wells in accelerated chemistry and physics classes. He was my all-time favorite teacher and hugely influenced my educational development.

I started out as a student at ASU in 1975 majoring in Electrical Engineering, but in my third semester I began to struggle in Calculus III. Over the summer I had pretty much forgotten how to integrate and the linear algebra topics (I think) did not make sense to me.

One night while studying for a calc exam, I just decided I no longer wanted to do it. I changed my major to wildlife biology right away. As a national merit finalist with a solid background, I should have been able to finish the Engineering degree, but I had never run into anything before that made me really struggle and I didn't know how to cope.

Finding my way to ASU Physics

When I graduated from ASU in 1980, the job market was tough and it was hard to find a decent job. The only jobs available in wildlife management were temporary remote positions in the field which seemed exciting for a single person but—as a family man with a baby—it no longer seemed desirable at all.

I was interested in insects and found a seasonal position rearing pink bollworm moths for sterile-male control. After the second season, I found a position as a lab aide in the Department of Zoology at ASU for which I was now very well qualified. I was literally the chief cook and bottle washer running the drosophila kitchen and cooking fly food for five labs engaged



Here's me with my Dad in his office at the milk barn. I loved trailing around after my Dad.

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Alarcon to serve on NRC committee

ASU Physics Professor [Ricardo Alarcon](#) has been selected to serve on the National Research Council's (NRC) Committee on Assessment and Outlook for Nuclear Physics. The NRC operates under the auspices of the National Academy of Sciences (NAS). The Committee has been asked to carry out a decadal study of nuclear physics (NP2010), the last of a series of 10-year studies conducted by the NRC Board of Physics and Astronomy (BPA) for the various fields of physics and astronomy.

The new 2010 NRC decadal report will prepare an assessment and outlook for nuclear physics research in the United States in an international context. The first phase of the study will focus on developing a clear and compelling articulation of the scientific rationale and objectives of nuclear physics. The second phase will put the long-term priorities for the field into a global context and develop a strategy that can serve as a framework for progress in U.S. nuclear physics through 2020 and beyond. The first meeting for NP2010 will take place at the NAS headquarters in Washington, DC on April 9-10, 2010.

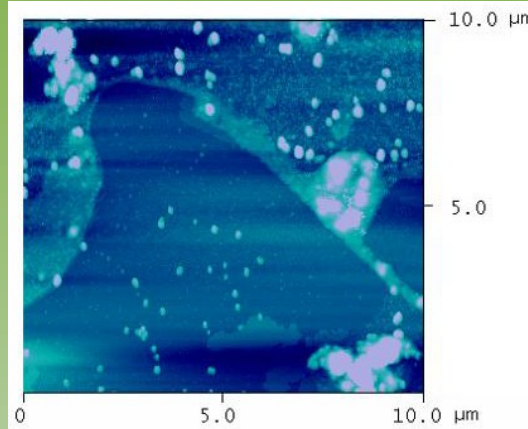


Ricardo Alarcon

From 2005-2007 Professor Alarcon served on the NRC Rare Isotope Science Assessment Committee (RISAC) whose report paved the way for the Facility of Rare Isotopes Beams (FRIB). FRIB will be a new National User Facility for nuclear science, funded by the Department of Energy and operated by Michigan State University. From 2007-2009, Alarcon served on the NRC Scientific Assessment of Free Electron Laser (FEL) Technology for Naval Applications Committee.

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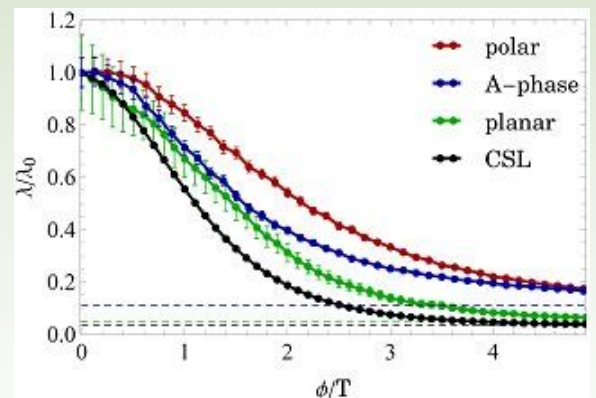
pulsed laser can be used to selectively inactivate specific pathogenic and non-pathogenic viruses. This research has implications for blood transfusions and treatment of rapidly mutating viral species, such as the human immunodeficiency virus (HIV).



The M13 bacteriophage shows up like a worm in the atomic force microscope (AFM) image. The AFM image (left) demonstrates that nearly all the worm-like features disappear and are replaced by mucus-like structures after the sample was irradiated by an ultra short pulsed laser, indicating that the laser irradiation affects the global structure integrity of the viral protein coat.

ASU Assistant Professor [Igor Shovkovy](#) and ASU Physics' graduate student Xinyang Wang have collaborated on research that was published in *Physical Review D*. The paper notes that current knowledge regarding state(s) of matter under extreme densities existing inside neutron stars is incomplete. One common hypothesis states that such matter is made of quarks and is a superconductor with very unusual properties. Shovkovy and Wang, along with collaborator Hossein Malekzadeh, studied the rates of nonleptonic weak processes inside several types of superconductor quark matter. The results are needed for calculation of viscous properties of matter and, in turn, for understanding possible slow-down scenarios for neutron stars. If the viscosity is very low, for example, the rotating star can become unstable and produce a burst of gravitational radiation that may be detectable by the existing and future detectors of gravitational waves. Numerical results from the study are found on the figure to the right.

The paper is based on the results of a research rotation project of Xinyang Wang. Before joining ASU, Shovkovy was an assistant



Professor at Western Illinois University and Wang was his Master's student. Wang is now a doctoral student in ASU Physics and began a research rotation project with Shovkovy in Fall 2009. Wang finished a large part of the numerical calculations that led to the paper.

In that same semester, Wang also won a fellowship from the Division of Particles and Fields of the Mexican Physical Society to attend the XII Mexican Workshop of Particles and Fields, held in Mazatlan, Mexico this past November. He gave an oral presentation of the paper's results at that workshop.



PHYSICS FLASH

WANTS TO HEAR FROM YOU

Please send your comments and story suggestions to phyflash@asu.edu.

Evolution of a Sun Devil [\(continued from Page 1\)](#)

in genetics research with fruit flies. I had intended to take classes at ASU while working in this position and try to finish a degree in engineering, but the zoology job proved to be much more demanding than I had anticipated. The problem was that to get the work done you had to stage batches of food and keep cooking continuously. There was no way to walk away and go to class.

The pay was dismal, significantly less than even the custodians made, and after a year or so I began looking in earnest. An opening came up twice in the Zoology department when a long-time jack-of-all-trades employee retired and I went for it. Although I didn't get the job, it turned out to be one of the best things that ever happened to me because it resulted in my moving to the Department of Physics.

In 1982, I saw an instructional lab tech job being advertised in ASU Physics. I wanted it badly because by this time financial pressures had forced me to take a paper route. I was getting pretty tired of rolling out at 4:00 am seven days a week running the route in addition to the lab job in Zoology. I went to see my high school physics teacher Malcolm Wells about a recommendation letter and he was happy to provide it. At the time, I had no idea he was so well-known and respected in Physics education circles and in particular by Professor [Howard Voss](#) (then Chair of ASU Physics).

I gave the application my best shot and was interviewed by Professor Voss. I invited him to come and see my kitchen facility which was only a short walk away, but he declined. I was disappointed as the kitchen sparkled and was my pride.

First thing Monday, I called Professor Voss asking if the decision had been made. I don't think he was very thrilled to be contacted about the job so soon after an interview. He began to tell me that people would be contacted when there

was something to report. But such was my desire to impress him with my immaculate kitchen that I offered to bring over pictures. He agreed.



TOP: Photograph from *ASU Insight* (May 14, 1990). Tim with his father Arthur. Tim received an Award of Merit and his father was honored for serving the university for 38 years. **BOTTOM:** Receiving congratulations from then ASU President Lattie Coor.



I got the job, more on potential than anything else I think, and that is how I came to the Department of Physics & Astronomy. I worked hard, learned a lot, loved the work, and loved working for Professor Voss. He is a good man and was a wise supervisor.

About three years passed when the decision to build the H-wing came along. Dr. Voss brought me in early in the project to help. I knew I might have to personally suffer the consequences or reap the benefits for the rest of my career as the physics elementary labs were slated to move into the new building. I was motivated and Dr. Voss mentored me. I worked endlessly for five years.

In 1990, near the project end and on Professor Voss' recommendation, I received a University Award of Merit for my work on the H-wing project. By this time I was a battle-hardened ASU veteran and well-established in the department. That same year, my father retired from ASU after 38 years and was also honored.

Project Oriented

I have always enjoyed a good project that involved creating something new and interesting. We had the money to fund projects and the Mechanical Instrument Shops to make them, so it was always a joy to bring something to life. Without the shops little progress could be made. I am very grateful to them for what they made, and for what they made possible. Some of the more notable projects I was involved with were an Ink Jet spark timing, Hydraulic table mover, display cases, Nitrogen dispensing system, Pendulum Wave, Classtalk, PRS, Lecture hall video projectors, Telescope mover, and the PIRT web site.

PIRT

The Physics Instructional Resource Team or [PIRT](#) has been my greatest professional achievement. Its success is a culmination of many years of groundwork laid by Professor Voss and fostered by a department that values instruction.

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Evolution of a Sun Devil [\(continued from Page 3\)](#)

Each member was/is outstanding in their own right and an individual winner of a departmental outstanding staff award. Each member has their own special skills and expertise, but also with individual limitations. But the whole was much greater than the sum of the parts, and together we could do almost anything.

Leading PIRT was my privilege, and we could stand proudly alongside any other group in the country and really belong there. One of the things that made it work was the bringing together of lab and lecture support under one roof—an organizational structure set in place by Professor Voss. It has seemed to me that in many places they are almost completely separate. As a result, program quality can be highly uneven between lab and lecture. Here we worked together.

I am excited for the future of PIRT and the department. With the recent hiring of

proud and most importantly the students will be well-served.



(From left to right) The Physics Instructional Resource Team: Wayne Easterling, Jim Krider (retired), Tim Cook, Iwonna Rzanek, and Armen Hakhoyan.

Armen Hakhoyan, with a probable additional physics PhD as my replacement, and with the new student help we have, PIRT will shed previous limitations. Instead of almost anything being possible, now everything will be possible, if the department continues to be supportive. I caution the department to be careful not to want too much too fast; not to use people up. Encourage, help, and they will make you

keep thinking of:

"Something hidden. Go and find it. Go and look behind the Ranges—

Something lost behind the Ranges. Lost and waiting for you. Go!"

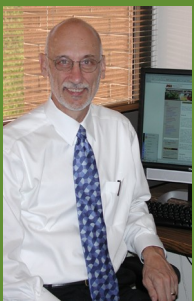
Thank you all for being a huge and important part of my life.

- Tim Cook

In Conclusion

I am excited for the future of ASU Physics, and I wish you all the very best. I will miss you all, but I find it is time for me to move on. People wonder what comes next for me, and I have to say I'm simply not sure. I have to sit down and do some hard thinking that I've just been too busy to do.

There's a stanza to a Kipling poem that I



Dear Friends of ASU Physics,

This month, we kick off our annual *Focus Forward* campaign. Information about the campaign will be mailed to all Friends of ASU Physics and we invite you to consider supporting the study of physics at Arizona State University.

To learn more about the *Focus Forward* message, please click [HERE](#). Thank you for being an important part of our success!

Robert J. Nemanich
Professor and Chair