CROSS SECTION

Stetson University Physics Department Annual Newsletter, Spring 2001
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Area Happenings

Hello Everyone!

And greetings from the Physics Department. This is the fourth edition of our annual newsletter, and we are glad it has become a tradition. Our apologies for this coming later than promised — we've expanded our coverage of research happenings in the department to include student abstracts, and the time frame was pushed back to accommodate including these. We hope you enjoy reading these abstracts (find them in the "Research Corner" section of the newsletter). More on the students in a moment...

We again thank you for your on-going warm support of this publication and the department. Alumni response was a bit down this year. Thank-you to those of you who did send in your news. We love to hear from you, and we look forward to expanding the alumni news section of this newsletter in future years.

While the winds of administrative change have blown fiercely for our country this year, we have had small breezes of our own. As you are by now aware, I took over as department chair in August when Tony Jusick stepped down after serving admirably for a five year term. This has meant that I've had to hand the baton of advising pre-engineering students over to George Glander, an area which he is very qualified to oversee. Otherwise, things are continuing along the same basic path they have been for recent years.

Perhaps the biggest news I have to report is that George was granted tenure and promoted to the rank of associate professor last spring. We welcome him as a permanent member of our ranks and look forward to his presence for the years to come.

The Department continues to flourish. This year we have a bumper crop of seven seniors. Our third year class shrank to three as several of its members were actually contemporary with the seniors and were able to join their peers in the senior class. We have four sophomores (one of whom is on leave), and the University Physics class currently has an enrollment of 13, from which we anticipate probably four or five majors. It's wonderful to have enrollments continue to be up.

With all the seniors, student research in the Department has been quite active, as you can imagine. We had three students win prestigious SURE (Stetson Undergraduate Research Experience) grants for the summer of 2000. SURE grants are increasingly competitive awards funded by private sources and open to the entire Stetson student body — typically, about 12 grants are given per summer. (For more information, see the SURE web site: *http://www.stetson.edu/programs/SURE.)* Two of these students, **Todd Du Bosq** and **Hope Wymer**, took advantage of this opportunity. Hope worked with George on a computer programming project of fast Fourier transforms which took advantage of her (additional) math major and which allow the data collected in George's lab to be processed more efficiently. Todd worked with me on the continuation of the video capture of vibrational holography work going on in my lab (see the "Research Corner" for more details).

Ed Wallace was also awarded a SURE grant, but he chose instead to take advantage of an REU (Research Experience for Undergraduates) at Auburn University, where he worked on a project in the general area of experimental plasma physics. **April Teske** also did an REU at Vanderbilt University where she studied biomagnetism using a high resolution scanning SQUID magnetometer. **James Stock** participated in an REU at the University of Florida in the general area of low temperature solid state physics. **Ryan Munden** participated in research at Argonne National Laboratory working in the area of high temperature superconductivity. And finally, **Stephanie Greenwood** got a jump start on her senior research last summer looking at solar astronomy under the supervision of Tony Jusick.

We continue to encourage our students to present their work at professional level forums. I continue to serve as chair of the committee sponsoring the now annual Stetson Undergraduate Scholarship And Performance Day (USAPD). A University- wide forum, USAPD celebrates academic excellence from all disciplines represented at Stetson. (For more information, see the USAPD web site: *http://www.stetson.edu/programs/usapd.)* Spring, 2000, Physics had a couple of students participate: **James Stock** presented his work on Nuclear Magnetic Resonance and Spin Echoes, and **Amanda York, '00**, presented her research on the Development of a TV Holography System for Modal Analysis of Musical Instruments. And this spring, 2001, six of our seniors will be participating (see their abstracts in the "Research Corner" section).

Five of our seniors were also able to attend the November meeting of the South East Section of the American Physical Society in Starkville, Mississippi with George Glander. Attending students were seniors **Todd Du Bosq, James Stock, April Teske, Ed Wallace,** and **Hope Wymer.** Congratulations to April, who was awarded runner-up to the Marsh White Award for best student paper (her abstract can be found in the "Research Corner").

We are proud to be able to offer such a diverse range of research experiences to our students. More in-depth information about all the research going on in the Department is available through our web site, *http://www.stetson.edu/departments/physics* – click from one of the choices from the index on the left: "Research," or the research labs section of "Facilities."

To support all this research, we continue to expand the department's resources for our students. Last spring, we added a scanning tunneling microscope. This piece of equipment is an exciting addition to our teaching laboratory; it makes for great demonstrations for visitors to the department, and this coming year we anticipate it being an important addition to our research facilities as one of our junior majors will be utilizing it in his senior research project.

Talk of a new science facility (a renovated and expanded Sage Hall, most likely) continues — more than mere rumor now. A committee has been formed with members from all the Natural Science departments, and we are discussing our needs and desires amongst ourselves and now also with the Development Office and the President's Staff. We'll keep you posted…

Our students, however, continue to make our current facilities home. Of course, being a lab science encourages this, but our chapter of The Society of Physics Students (SPS) has been especially active this year under president **Ed Wallace** with a monthly movie night (with popcorn and movies not related to physics) and our successful second annual T-Shirt contest (see the last page for more on that). They also took a trip down toward the space coast to watch the November 30, 2000, night launch of the space shuttle. It's good to see our students build friendships within the department.

As always, we wish you the best in the coming year! Please stay in touch and drop by if you're ever in the neighborhood.

— Kevin Riggs, Chair

Research Corner

With much help from two successive Stetson Undergraduate Research (SURE) students, **Amanda York, '00**, and **Todd DuBosq, '01**, I am pleased to report that we now have a working TV holography system to compliment our existing time average holography research capability. Time average holography was invented by Karl Stetson (no kidding, and no relation to John B., according to Karl anyway) in order to be able to image the vibration patterns (modal patterns) of vibrating objects (e.g. musical instruments, at least in my lab). We now have a large library of time average holograms of everything from guitar bodies, to bells, to steel drums, thanks to research started by **Frank McDonald, '99**, and continued by **Robert Bedford, '98**.

A typical time average hologram of a vibrating circular plate is shown on the left panel of figure 1 below. The three bright diameters and one bright circle (near the outer edge of the plate) are the locations of the nodes (regions where the plate is not vibrating). The "bulls-eye" like rings in between the nodes are interference fringes caused by the rms displacement of the plate as it vibrates. Each bright or dark fringe can be thought of as a contour of equal rms displacement (much like a topographical map). The figure on the right is one of our very first TV holograms, taken last summer by Todd DuBosq. Note that the nodal diameters and circles are easily seen, and even some interference fringes are visible (but maybe not very well on your Xeroxed copy of this document). However, you have probably noticed that the resolution of the hologram on the right is much worse than the one on the left. So you may ask, "why spend so much time on TV holography, when you already could do much better with time average holography" (or you might put it less charitably as "You idiot! You just made things worse!"). The answer to your understandable question is that we want instant gratification (and who doesn't in this day of nearly instant everything). We want to be able to see how small changes in the drive frequency or amplitude affect the modal pattern without having to go off and develop holography film for hours at a time. TV holography allows us near real time image acquisition, although with the obvious lower resolution.

TV holography replaces the high resolution holography film with a much lower resolution CCD video camera. Care must be taken to make sure that the interfering object and reference beams enter the camera at nearly the same angle of incidence. The object must be vibrating at frequencies large compared to the frame rate of the CCD camera (30 Hz) to obtain the same averaging effect as for the film.

It was a very interesting example of synchronicity that the very week that we finally got our first TV hologram out of our system, none other than Karl Stetson himself e-mailed me wanting to know if I was interested in buying a commercial TV holography system from his new company. It was with great pleasure and pride that I was able to e-mail him back to say “no thanks, we have our own home-built system up and running as of a few days ago”. Figure 2 below shows some more modal patterns of the same circular plate shown in figure 1.

—Kevin Riggs

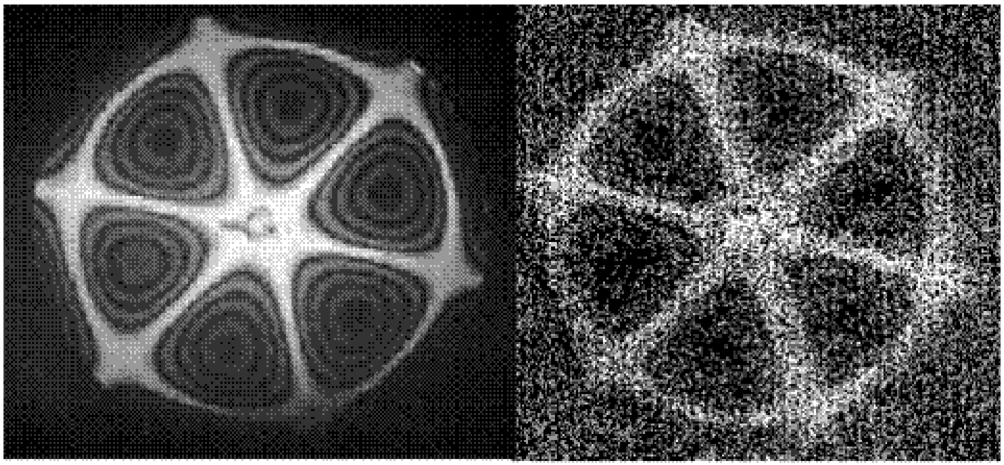

Fig. 1 — *(left)* Time average hologram (using holography film) of a circular plate, vibrating in the (3,1) mode. *(right)* The same mode captured using TV holography. Note that the interference fringes are just barely resolvable on the TV hologram, but the nodal diameters and circle are easily detectable.

Abstracts

*Below are the abstracts submitted by our senior physics majors for Senior Seminar (PS-499), to present at the November, 2000, meeting of the Southeast Section of the American Physical Society (SESAPS), or to present at Stetson’s third annual **U**ndergraduate **S**cholarship **A**nd **P**erformance **D**ay (USAPD), in April, 2001. We salute the accomplishments of our seniors, and we wish them well as they head off after graduation in May. We hope you enjoy reading about the research they have been up to...*

Development of a TV Holography System to Analyze Modal Patterns in Percussion Instruments

By: Todd DuBosq and Kevin Riggs, Physics Department, Stetson University (SURE grant funding)

A hologram is the record of the interaction between two beams of coherent laser light onto high-resolution holography film. A time average hologram of a vibrating object allows visualization of modal patterns at certain resonant frequencies. Analysis of these modal patterns gives information about the motion of the object, including which parts of the object are oscillating at maximum amplitude (anti-node) and which parts remain still (node). The TV holography design is basically the same as time average holography, but a CCD camera is used instead of holography film. Two methods of TV holography, subtraction and phase stepping, were used to study the different modal patterns of a circular plate.

Study of Grain Boundaries in YBCO Superconducting Films.

By: Ryan Munden and Peter Berghuis, Materials Science Division, Argonne National Laboratory (ERULF/DOE funding)

Current interest in high temperature superconductors (HTS) has warranted much research into their properties. Many difficulties exist in applying these ceramic-like superconductors in technological and scientific uses. Many manufacturing techniques attempt to eliminate these difficulties, especially those that limit the critical current density, Jc, of the superconductors. Great efforts are made to assure that the grains of the superconductor are all aligned, providing a high Jc. One of the greatest difficulties is the presence of grain boundaries, regions where the grains of the superconductor suddenly shift orientation by several degrees. These grain boundaries introduce little understood effects into the behavior of the bulk superconductor. By evaluating thin films of YBa2Cu3O7 (YBCO) with a grain boundary of well defined misorientation angle it is hoped that a better understanding of their effects can be determined. Low angle grain boundaries can increase Jc through improved flux pinning. High angle grain boundaries can greatly degrade Jc by causing high current dissipation due to increased flux flow. Through current-voltage measurements over a broad spectra of magnetic field and temperature conditions, the effects of a low angle grain boundary in an YBCO film are examined.

Parameter Testing of Computational Technique for Determining 3D Surface Structures from KED Images

By: James M. Stock and George Glander, Physics Department, Stetson University

Electrons have both a particle and wave nature. The wave-like properties of electrons can be utilized in examining the structure of a material. LEED (Low Energy Electron Diffraction) analysis involves bombarding a sample with electrons and recording the scatter pattern on a screen above the sample. The pattern contains a set of bright diffraction spots that represent elastically scattered electrons. These spots act as the experimental reference for computer models of the surface structure of the material. However, the process is time consuming and requires a supercomputer. KED (Kikuchi Electron Diffraction) analysis, a recent adaptation of the process, includes data from electrons inelastically scattered from a material and uses a method analogous with holography to directly generate a real space image of a sample’s surface structure within a day using a regular personal computer. This data is present in all parts of the diffraction images, not just the diffraction spots. Computer programs designed to perform holographic analysis on diffraction images were tested for trends.

Search for a Structural Phase Transition in MCCL

By: James M. Stock and M. W. Meisel, Physics Department, University of Florida (REU/NSF funding)

The search for low temperature superconductors has generated an interest in the study of low-dimensional systems in several laboratories due to their similarities with some models proposed for superconductor behavior. Since the inherent properties of these materials and their usefulness as models are dependent on structure, it is imperative that the factors affecting such structures be studied. $(CH_3)_2NH_2CuCl_3$ is one of these possible model structures. Unpublished experiments in neutron scattering indicated that a structural phase transition might be present in the material between 100K and 200K. A sample was designed for use with a probe capable of covering this temperature regime. A capacitance bridge was used to detect the thermal expansion of MCCL. A discrepancy assumed to be the transition point was located in the temperature region of interest.

Using a Scanning SQUID to Image High Spatial Resolution Magnetic Field Distributions of Geological and Biological Samples

By: April L. Teske and Franz Baudenbacher, Living-State Physics Department, Vanderbilt University (REU/NSF funding)

Editor's note: This is the abstract for the talk which April presented at the SESAPS meeting in November, 2000, and for which she was awarded runner-up for the Marsh White Award for best student paper.

The NanoSQUID is a low transition temperature Superconducting QUantum Interference Device scanning microscope. With a new design, NanoSQUID is one of the most sensitive magnetic field detectors with a spatial resolution of a few hundred microns. The challenge is to scan a sample that is at room temperature while keeping the pick-up coil of the SQUID at 4.2 Kelvin. The applications of this device include scanning meteorite samples for geological studies and scanning heart tissue to better understand action current propagation.

Analysis of Ferrofluids Using the Vibrating-Sample Magnetometer

By: April L. Teske and Kevin Riggs, Physics Department, Stetson University

Knowing the behavior of magnets or magnetic substances in an external magnetic field has led to many innovations in the development and use of magnetic materials. One such creation is a ferrofluid. A ferrofluid is a fluid containing tiny ferromagnetic particles, which can move and align to an applied magnetic field, changing the viscosity as a result. This property makes ferrofluids useful in variable shock absorbers in some new cars. We chose to explore the properties of ferrofluids by looking at the results we get when we examine it in a Vibrating-Sample Magnetometer, or VSM. A VSM is an experimental setup that uses an electromagnet to apply an external magnetic field to a sample while it oscillates, in order to induce an *Emf*, or voltage, signal. By graphing the magnetization (the magnetization is proportional to the induced *Emf*) versus the applied magnetic field we get a hysteresis loop. The hysteresis loop allows us to see how the ferrofluid is magnetized at different field values, and helps us to better understand the characteristics of this magnetic material.

Holographic Analysis of Kikuchi Electron Patterns for the Si (111)-(Ö7´Ö7) R19.1°-Al Surface Structure

By: Edwynn A. Wallace and George Glander, Physics Department, Stetson University

The surface structure of solids has been an important subject for a variety of fields from material science to medicine. A successful technique for probing the surface is low energy electron diffraction (LEED). Unfortunately, traditional applications of LEED analysis are time consuming since they require the use of a supercomputer and the collaboration of different research groups and specialists. A group in China, however, has developed a technique that utilizes the interference pattern caused by Kikuchi electrons or electrons that collide inelastically with atoms in the surface. This pattern is analyzed using a technique similar to how holograms are formed. The result is a three-dimensional image of the surface structure that can be created using a personal computer within days of collecting the data. This technique was used to study the Si (111)-(Ö7´Ö7) R19.1°-Al surface structure. When the resulting image was compared to a previous theoretical model, the data from the experiment and the predictions of the model did not agree.

The Effects of Plasma Rotation on Driven Waves in a Linear Plasma Device

By: Edwynn A. Wallace and Edward Thomas, Jr., Department of Physics, Auburn University (REU/NSF funding)

Plasma, or the fourth state of matter, can be simply defined as an ionized gas. In fact over 99% of the visible universe is composed of matter in this state. Other than in space, plasma also exists on earth in objects ranging from fluorescent light bulbs to lightning bolts. The most promising use of plasma is in the development of fusion power, the same process that powers the sun and the stars. Since plasma is a collection of charged particles, electric and magnetic fields can effect these particles. If the electric and magnetic fields are perpendicular to each other, the particles in the plasma will experience a drift that causes the plasma to rotate. Similar rotations can be found in plasmas in the magnetosphere of the earth that produce waves that can interfere with satellite communications. If rotation is established in fusion plasma, the rotation increases the confinement and efficiency of the reactor. In this experiment low frequency waves were launched into a rotating helium plasma. Measurements were taken of the effects of rotation on the propagation of waves in the plasma. These observations were compared to the electric field used to generate the rotation.

Using Fast Fourier Transforms in the Analysis of Electron Diffraction Data

By: Hope Wymer and George Glander, Physics Department, Stetson University (SURE grant funding)

The surface structure of a solid plays a vital role in how it is affected by and interacts with other substances, which makes knowledge of this structure significant for research in medicine, electronics, and many other fields that have an impact on daily life. We are investigating a new method (developed by a group in China) for determining the surface structure from electron diffraction data that is faster and requires fewer computer resources than traditional methods. It recognizes that part of the diffraction pattern contains an interference pattern similar to that found in a hologram. Inversion of that interference pattern produces an image of the structure. This inversion can be performed using a Fourier transform. Only a fast personal computer is necessary, although it still takes about twelve hours to perform the calculations for a single trial. For this reason, we are looking into the use of a Fast Fourier Transform, which eliminates patterned repetitions in the calculations.

From the Faculty

KEVIN RIGGS *(Chair)*

Well, this year I finally failed in my continuing efforts to dodge any type of administrative responsibility by drawing the dreaded chairmanship of the department. Just in time for the new millenium and for the 10 year accreditation review. So let me welcome you all to the "From the Faculty" letter section as the newly appointed departmental chair.

Much has happened since I reported to you in the last newsletter. I spend a successful summer in the research laboratory with **Todd DuBosq, '01**, a Stetson Undergraduate Research Experience (SURE) grant recipient. Thanks to much preliminary work by **Amanda York, '00**, Todd was able to finally get our TV holography experiment up and running (more about this in the "Research Corner"). Todd presented his work at the Southeast Section of the American Physical Society meeting held at Mississippi State (November, 2000). Todd will also be presenting his work at Stetson's Undergraduate Scholarship and Performance Day (USAPD), a recently inaugurated forum for presenting research results on campus (see *http://www.stetson.edu/programs/usapd* for more information).

Last fall, I taught a course in Computational Physics which involved using numerical algorithms to solve physics problems that are not tractable using analytical techniques (using both traditional programming and some Mathematica). The enrollment in this course was very good, but since it was taught in a workshop style, it involved a lot of running around consulting and debugging on my part. I also taught Experimental II and the lab for Modern Physics. This spring I am teaching one of my favorite courses, The Science of Music, a general education course that emphasizes the physics of musical instruments (musical acoustics). I am also teaching Optics (including a new lab component that I have developed), and our survey course in Atomic, Nuclear and Particle Physics.

I am also happy to report that we have a nice new toy in the department. Thanks to the Frueauff foundation, we now have a scanning tunneling microscope (STM) to call our own. This new acquisition enables us to actually image atoms at the surfaces of metallic samples (Carbon atoms on the surface of graphite is one of the all time favorites). It is interesting to note that the guys that invented the STM (Gerd Binnig and Heinrich Rohrer of IBM Zurich) developed the STM in only the early eighties, wining the Nobel Prize for their work in 1986. Now our sophomore level students are able to use this instrument (last fall in Modern Physics lab), and one of our junior majors (**David Falls, '02**) will be using the instrument next summer for his senior research work. However, we almost lost our new toy over Christmas break when Sage Hall decided to develop a roof leak right over the STM unit. Fortunately, I had (just by accident) placed a Plexiglas cover over the unit to reduce acoustic vibrations, and this cover protected the unit from the worst of the deluge. Good thing that we are planning a Sage Hall addition and renovation project in the near future!

Of course, I still find myself in charge of planning for the Undergraduate Scholarship and Performance Day (USAPD) this year. The good news is that one of our very own, **Bill Newsome, '74**, has agreed to be the keynote speaker for next year's event. I also have the pleasure of coordinating the Stetson Undergraduate Research Experience (SURE) program again this year. Just call me Stetson's student research czar! I guess all my work in this area has gained some attention, however. This year, I was elected to the Physics and Astronomy division of the Council on Undergraduate Research (CUR).

On a personal note, my wife and I finally got the chance to take a long planned and long awaited trip to Europe. We bought a 3 week Eurorail pass and started in Frankfurt and ended up in Paris, visiting such places as Frieburg, Munich, Salzburg (where I visited Christian Doppler's birthplace which was right across the street from Mozart's house, quite a neighborhood!), Vienna, Venice, Como (where I got a chance to see the "Temple of Volta" in honor of Alexandro Volta, the guy the volt is named for), Interlaken, and more in between (if the trip sounds tiring, it was, but well worth the effort!). My wife, Lori, liked the Lake Como region of Italy so much that we are planning a second trip to the area for next summer. We plan to fly into Rome, head up to Florence (of course I need to see Galileo's house) and then end up in the Lake Como region. I will let you know how the trip went in the next edition of CROSS SECTION.

—Kevin
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GEORGE GLANDER

Hello again! It's been another busy year for me, but it's been a good year too. I'm pleased to join the ranks of tenured faculty, and Laura and I look forward to being in DeLand and at Stetson for the years to come.

Once again I'm anchoring the introductory majors by teaching University Physics. Enrollment is up, and last fall for the first time in a long time we had to offer two lab sections. It's a good group, and we are hoping to have four or five new majors emerge. I also find myself capping off students' careers here, as I have again been teaching the Senior Research Proposal and Senior Seminar courses. Last spring, I completely overhauled these two courses, and everyone seems more comfortable with them now. In the middle, I've also been teaching E&M, Thermodynamics, and this spring I'm teaching and doing a major overhaul of Experimental Physics I. Never a dull moment…

Last summer I continued working on my research investigating the holographic analysis of electron diffraction data. It's always good to get back into the lab, and this summer I had two students working with me, **Edwynn Wallace, '01**, and **Hope Wymer, '01**. Ed was trying to apply holographic analysis to a surface structure that has not previously been fully solved. His results strongly suggest that the model that had been proposed for the structure is wrong, but we have been unable to devise a model that agrees both with our results and with images that other researchers have obtained with a scanning tunneling microscope. Hope has been working to reduce the time required to process the data by switching from a standard Fourier transform to a fast Fourier transform. Her work has been very important in helping to understand the mathematics imbedded in the processing. Hope presented some of her results in a talk entitled "Using Fast Fourier Transform in the Analysis of Electron Diffraction Data" that she gave during the student session of the South East

Section of the American Physical Society held at Starkville, MS, in November, 2000 (her abstract can be found in the “Research Corner”).

Laura and I also took some time off last summer (squeezed in between some of our kids’ favorite summer camps) to take the kids to Boston for our vacation. We saw family, watched whales (very spectacular), hiked the Freedom Trail in Boston, wandered around the beautiful New England countryside, did a brief visit to NYC, and stopped to hike in the North Carolina mountains on the way home. It was a great trip. Our kids are growing like weeds. Ian, now 11½ , is in fifth grade and loves Star Wars, Lego, and music. Elizabeth, now 8½, is in third grade and loves to dance and dreams of being an astronaut on the Space Shuttle.

Hope all is well with all of you. Do keep in touch.

—George
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ANTHONY T. JUSICK

Well, it's 2001! This is my 35th year at Stetson and it's time for me to be suitably rewarded. That means a painting of my choice by long time artist Fred Messersmith. Forgive me if I did not choose a portrait of Sage Hall. However I did choose a view from the upper balcony of Sage Hall looking out toward the boulevard and Elizabeth Hall. Unfortunately the view, which I didn't realize at the time I chose it, was about twenty years old. It was a nighttime view and the sidewalks were framed by newly planted small trees and artistic looking yellow street lamps. It was quite picturesque. Unfortunately I knew I was in trouble when Fred came to paint it and he asked just what I wanted to emphasize. The trees had grown and you couldn't even see most of the street lamps anymore. I didn't know quite what to say and I don't know what he ended up painting. I am placing my faith in his aesthetic sense and deciding whether to show up at the dinner where I'll actually receive this painting.

I am now playing better golf than I have in my entire life. I wish I could say that it was my advanced knowledge of the principles of physics that have produced these long awaited results. In that regard all I can say is that I know that every time I swing a golf club I am in agreement with the laws of physics! To you golfers out there, need I say more? The one hundred golf books and videos I have haven't helped much either. Actually it was a lesson from a snow bearded local pro which finally turned the trick. I was actually so far off the norm that he had to result to true basics to bring me back on line and it worked. Sounds ridiculous doesn't it? That's what all the books and videos were supposed to be for. But it does make a point. There's no substitute for the personalized teacher-student relationship! So I have finally brought my professional career here and my most passionate hobby into congruence.

On the personal front I have a wonderful three year old grandson and a granddaughter on the way. Needless to say I will be initiating them into both the mysteries of golf and physics. Notice the inadvertent order in which I have placed these central themes of my life. I never thought I would enjoy being a grandfather but I must say I am loving it.

I am teaching mainly Math Methods which I'm sure many of you remember, Astronomy and junior level Mechanics. I'm still having fun and of course my students absolutely love it!! I am considering developing a course in meteorology also. Surely non-science majors would see the relevance of such a course to their everyday lives?? Ah well. Hope all of you are well and enjoying the challenges that life hands all of us!

—Tony
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THOMAS A. LICK

I taught Modern Physics last semester, a course that is enjoyable to teach because in it I get to introduce students to seemingly impossible realities such as the concept that an electron can go through two slits at the same time or move from one location to another without ever being midway between those locations. The final exam for Modern Physics was scheduled for Dec. 12, 2000. I wish it had been moved back two days to Dec. 14 since that date was the centennial of one of the most famous events in physics. On Dec. 14, 1900 Max Planck first introduced the concept of quantization to the world and started the revolution that is called Modern Physics. It is interesting that Max Planck did not attach any fundamental importance to his own work until after the quantization concept was used by Einstein in his famous paper explaining the photoelectric effect. Even after this event many physicists were slow to accept quantization and recognition of the importance of Planck's contribution was slow in coming. When you think of it, this is similar to what happens in our lives. Your children often do not realize the importance of your contributions to their lives until after they have faced some of the problems of life that you tried to prepare them for. And even then they are often slow to appreciate fully the importance of your fundamental contributions in shaping their psyche. The same often happens at your workplace. I guess that if I am waxing more philosophical, it is because of the informatory notes we occasionally get from alumni which detail their success in their chosen professions. We feel in reading such a note that as a teacher one of us has made a contribution to that life, even if slight. To all of you who have replied to our mailed cards and kept us informed of your progress, we are appreciative.

—Tom

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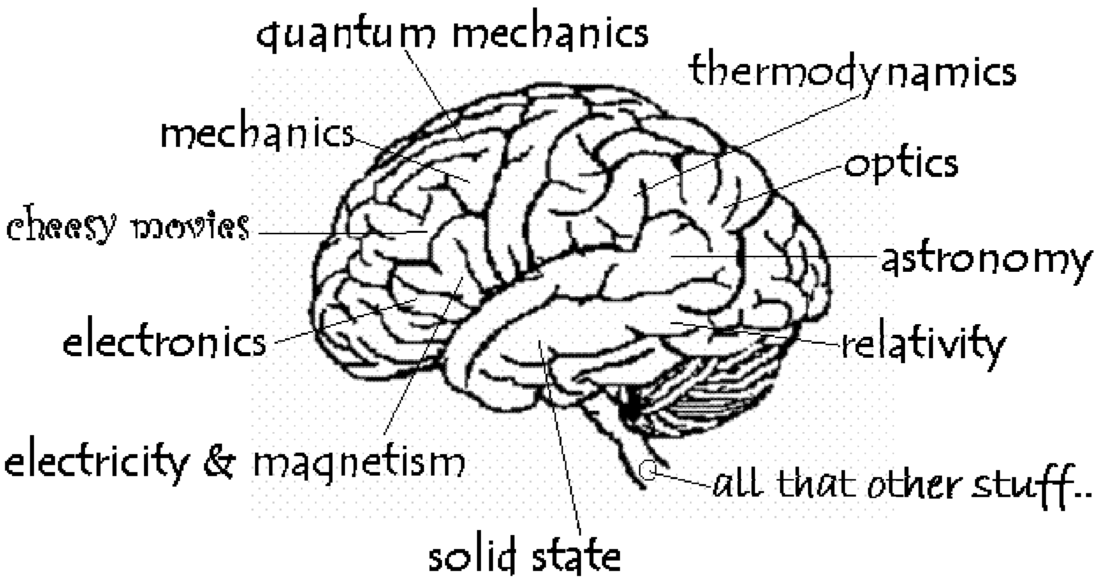
This year's T-Shirt contest:

Well, here it is... The winning design of the Second Annual Physics T-Shirt Contest. On the front, in the pocket area, is the above title... on the back, the design below. The T-Shirt is 100% cotton, and deep burgundy in color with white printing. Congratulations go to Ed Wallace, '01, and Dr. Tony Jusick for submitting the winning design, and thanks to the Stetson Print Shop for making the design a reality.



THE MIND OF A PHYSICIST

CROSS SECTION was compiled and edited by Laura Glander, February, 2001.