

# Schrödinger's Tiger



*The Clemson University Physics and Astronomy Newsletter*

Spring 2007

Volume 1, Issue 2

## Arctic Science Adventure for Clemson Undergraduates

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The Clemson participants in the launch include, from left to right, Andrew Kelleher (physics), Caroline Yount (physics), Tianyu Zhan (graduate student, physics), Arpan Shah (electrical engineering), Greg Twork (physics), Jonathan Howlette (mechanical engineering), Dan Brown (geology), Phillip Martin (graduate student, electrical engineering), Lucas Hurd (physics), Dusty Coleman (mechanical engineering), Bridget O'Donoghue (physics), Justin Ingersoll (graduate student, electrical engineering), Peter Barnes (Chair, Dept of Physics & Astronomy), Clarence Collins (physics). All students are undergraduates unless otherwise noted.

January and February are not the typical months when tourists travel to Alaska, but those are exactly the right months for studying the aurora, or northern lights, in the polar skies. This year, shortly after New Years Eve, a group of eleven Clemson undergraduates traveled to Fairbanks, Alaska, to participate in the launch of eight suborbital rockets designed to study the plasma physics and electrodynamics during an auroral disturbance. The students made important contributions to the instruments flown on the rockets, as well as instrumentation operated on the ground during the flights.

The objective of the experiment was to measure the atmospheric heating created by the strong electrical currents in the atmosphere 60 to 90 miles above the surface of the Earth during auroral displays. The first four rockets were launched on January 19th and a second set of four on February 14th. The launches were the highlight of the trip, but they also represented the culmination of more than 18 months work carried out in preparation for the experiment.

The interdisciplinary student group included physics majors, mechanical engineers, electrical engineers, and computer science majors. The project was led by **Dr. Miguel Larsen** of the Department of Physics and Astronomy. During the year and a half leading up to the launches, the students worked on designing and manufacturing components of the rocket science instruments, as well as the instruments that would be used on the ground to obtain measurements from the rocket flights.

(Continued on page 3).



Dr. Peter Barnes, Chairman,  
Physics & Astronomy



## A Message From the Department Chair

The spring semester has brought many wonderful research and educational opportunities for our faculty and students. Our professors continue to lead quality research programs and to engage our students in meaningful and rewarding projects, such as the Alaska rocket program. Our students, moreover, continue to demonstrate excellence and leadership in their respective fields.

On a sad note, we mourn the death of one of our graduate students, whom we lost to a tragic accident in the fall. We also find ourselves wishing a speedy recovery to one of our undergraduates, who was injured earlier this year in an accident on campus.

At the beginning of this semester, we sent a departmental survey to our alumni asking them to provide information on themselves, their career trajectories, and how a Physics education has impacted their lives. We have had more than 60 responses from alumni, including a retired F15 fighter pilot, doctors, attorneys and the CEO of a family-run business, as well as faculty at several universities and colleges. Several alumni have offered to speak to our students when they are in the area. The first of these scheduled talks will be in late May.

I hope you will find this newsletter informative and will be as excited as I am by the many wonderful developments in our department.

Peter A. Barnes, Professor and Chair  
Department of Physics and Astronomy  
Clemson University, Clemson SC 29654-0978  
Voice: (864)656-3416

## Creating a Legacy... Giving to Clemson Physics & Astronomy

You can create a lasting legacy through your donation to the Clemson University Physics and Astronomy Department Foundation. The state of South Carolina can guarantee only that Clemson provides a basic level of education. Endowments to Clemson assure the best faculty, the brightest students and the most creative research projects. Substantial endowment can transform a good university into a great one.

The support of loyal Clemson friends has been instrumental in building a record of excellence in education, research and public service. Clemson's share of state funds supports less than 38 percent of the University's operating budget each year. Through gifts to the Clemson University Physics and Astronomy Department Foundation, donors share in a proud tradition of commitment that helps the department achieve greater distinction year by year.

As a nonprofit organization, the Foundation is exempt from federal income tax under Section 501(c)(3) of the 1986 Internal Revenue Code as amended. The Foundation has been classified by the IRS as a public charity operated for the benefit of a state university as defined in the Internal Revenue Code of 1986 Section 170(b)(1)(A)(iv). Contributions to the University through the Foundation by individuals, corporations, organizations and other foundations qualify as tax deductions. The Internal Revenue Service identification number assigned to the Clemson University Foundation is 57-0426335.

They also worked closely with graduate students, technicians in the Physics Department at Clemson, and engineers at NASA's Wallops Island Flight Facility, which carried out the launch operations.

Disturbances in the upper atmosphere or ionosphere have been of great concern to all agencies and companies that operate in space, including the military, satellite communications companies, agencies responsible for navigation or global positioning, and NASA.



Clemson students (Caroline Yount, Justin Ingersoll, Lucas Hurd) carry out testing of payload components at NASA/Wallops Flight Facility in Virginia.



An impromptu lecture by Laureline Sangalli, a scientist at the University of Calgary who participated in the experiments. Students include Bridget O'Donoghue, Arpan Shah, Andrew Kellerher, Dusty Coleman, Greg Twork, Dan Brown, Philip Martin, and Jonathan Howlette.

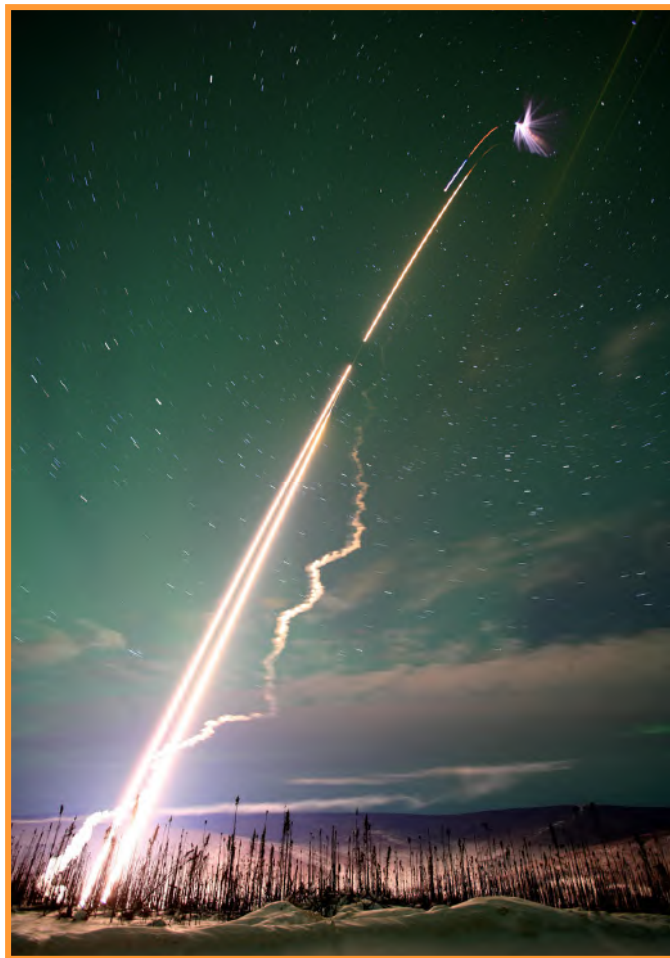
Because that part of the atmosphere has large concentrations of charged particles, strong electrical currents and large charge concentrations occur there. The currents associated with the aurora represent some of the strongest and most disruptive disturbances that can adversely affect space craft and communications.

Primary funding for the research, as well as the rockets that carried the instruments aloft, was provided by NASA. Support for the student participation came from a combination of NASA and Clemson funds.

The launches in 2007 are part of an ongoing program in the Physics and Astronomy Department at Clemson. Since 2001, undergraduates have participated in launches at Poker Flat, Alaska, at Wallops Flight Facility in Virginia, at Kagoshima Space Center in Japan, and at the Reagan Test Site on Kwajalein Atoll in the central Pacific. Each of the experiments has involved an interdisciplinary group of students that included mostly physics and engineering majors.

The experience in Alaska was very different from the previous launch project on Kwajalein Atoll in August and September 2004. That experiment focused on ionospheric disturbances at the Earth's magnetic equator and treated the participants to tropical beaches and palm trees swaying in the gentle ocean breezes. Conditions in Alaska, on the other hand, had only a few hours of daylight each day and temperatures down to  $-40^{\circ}\text{F}$ . Since support for the launches required students to operate equipment outdoors, extreme cold weather arctic gear was the order of the day.

The experiment was a collaboration between Prof. Larsen from Clemson and researchers from the NASA/Goddard Space Flight Center, the University of Calgary, and the Aerospace Corp. There were researchers and technicians from each of those institutions at the launch facility, located 30 miles north of Fairbanks, Alaska, who were there to support the launches.



Launch of the first two rockets in the experiment on January 19, 2007, from the Poker Flat Research Range located near Fairbanks, Alaska.



Dog sledding near Chatanika, Alaska, prior to the launch window opening on January 19, 2007. Students are Arpan Shah (standing) and Clarence Collins (seated).

The science and technical staff members were generous with their time and provided many impromptu lectures for the students during their time at the range. The experiment thus became both a hands-on experience and an educational environment.

In addition to the science experience, the trip also provided an opportunity to experience Alaska. Winter in Alaska is cold but also very beautiful. Besides the mountains and forests, the natural beauty includes the auroral displays. Watching the aurora was an especially popular activity on the nights when launches were not possible and the displays could be observed with a more leisurely mindset. Dog-sledding provided another way to see the outdoors.

The sophistication of the student-built rocket projects has increased with each launch since 2001, and the instruments that were built for the launches in Alaska were the most advanced so far. A benefit of the projects has been the interaction between the science and engineering students. The science students often see problems in quite different ways than engineers. The collaboration makes the students aware of these differences and encourages them to work together to solve problems so that all requirements are met.

Besides the cooperation within the team of students, the projects also require that they work with graduate students and technicians at Clemson on a day-to-day basis.

NASA carries out the launches and is therefore responsible for both the safety and correct functioning of the rockets during flight. The technical staff at the NASA/Wallops Flight Facility has been exceptional in giving of their time and expertise to help make the student projects a success. (Continued on next page).



Although most of the students supported the launches at the rocket range, several students traveled to remote locations in the northern part of interior Alaska to operate ground instruments there. The sites included two small villages, Fort Yukon (pop. 300) , and Coldfoot, with 9 inhabitants.

The majority of the students arrived in Alaska on January 5, six days prior to the opening of the launch window, to set up equipment and prepare for the launches. On each night during the window, the launch team waited for the right conditions, including clear skies and strong auroral currents under the rocket apogee, where the main rocket measurements are made.



The aurora, or northern lights, are the result of particles in the solar wind that impinge on the outer edges of the Earth's atmosphere.

On the ninth night of the window, January 19, all the pieces fell into place and the four rockets were launched, all within a period of sixteen minutes. The measurements were the most complete measurements of the heating effects of auroral electrical currents on the atmosphere carried out so far.

Larsen's research program into the electrodynamics and plasma physics of the upper atmosphere has been an ongoing effort in the Physics and Astronomy Department since the mid 1980's. The direct involvement of the undergraduates in the research program is a more recent development that has provided benefits both the research program and for the students.

The work of analyzing the extensive data set provided by the rocket flights now begins and is expected to take six months to a year.

## Garden Variety Astronomy

On a clear night in Clemson you might find our astronomy lab students and their instructors studying galaxies, star clusters, or the moons of Jupiter in the South Carolina Botanical Garden. Currently, we carry our small telescopes to the garden, which is a reasonable compromise between access for the students and background light level.



Students and faculty enjoying a view of the night sky.

Our hope is to acquire one or two larger telescopes to be kept in the garden for better observing and easier access. The garden directors are enthusiastic and interested in helping by providing access and space.

We would also like to offer observing opportunities through the SC Botanical Garden education and outreach programs, which will be a nice complement to our planetarium outreach program. Stay tuned to this space for opportunities for alumni and friends of Physics & Astronomy to observe with us. Our long-term goal is to create a permanent astronomy presence in a science center in the garden.

## CAPRI Competition Has Begun

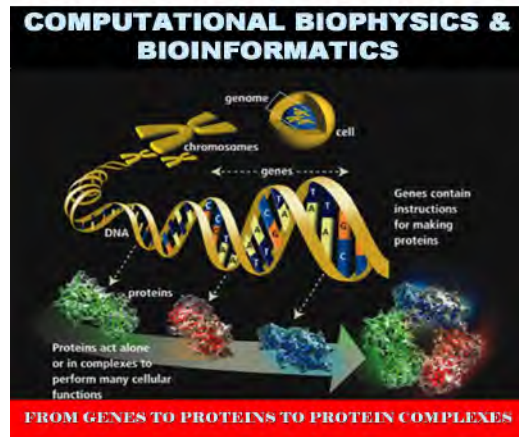
For the first time a Clemson team will participate in a community-wide experiment on the comparative evaluation of protein-protein docking for structure predictions. The Critical Assessment of Prediction of Interactions (CAPRI) experiment is now in round twelve, involving 37 groups from 9 countries worldwide, including the lab of Computational Biophysics and Bioinformatics at the Department of Physics and Astronomy at Clemson.

CAPRI was launched in June 2001 by Ilya Vakser and Sandor Vajda. The organizing meeting was held in Charleston, South Carolina, attracting many groups involved in the development of protein-protein docking algorithms.

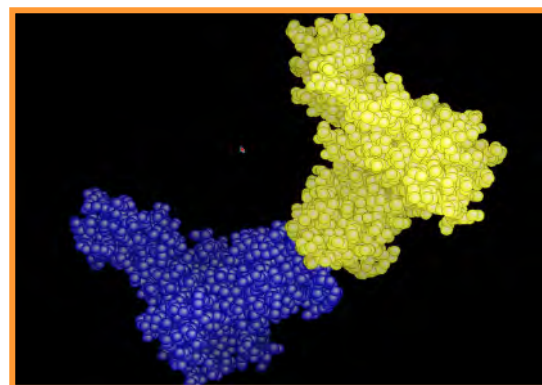
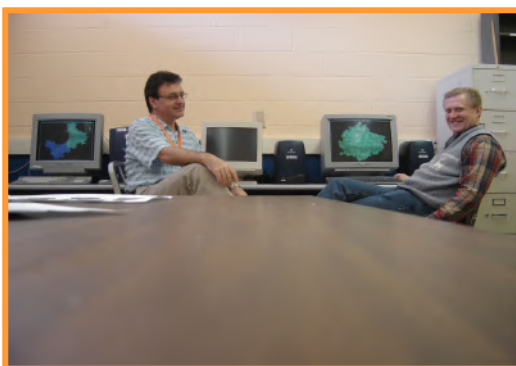
The problem of predicting protein-protein interactions is very important, especially in the post-genomic era when we should take advantage of the knowledge of the human genome. Now the goal is to utilize this information to better understand the mechanism of macromolecules' interactions in the living cell.

"Predicting 3D structure of a macromolecular complex is not an easy task", said Dr. Emil Alexov. "The protein macromolecules are huge and made of hundreds of thousand atoms. The human cell contains about 400,000 protein molecules, and, on average, each molecule is involved in four interactions. It is amazing how in such a complicated environment the protein molecules find their partners. If we can reveal this process then we will have much better understanding of the living cell function".

The groups participating in the CAPRI competition are given the target proteins, and they are asked to predict the 3D structure of the complex. After the predictions are submitted, another group will experimentally determine the 3D structure of the protein complex and then the *silico* predictions will be compared to the experimental structure. "We are working around the clock to meet the deadline of March 11", said Alexov. "I hope that we will manage to generate predictions of high quality, but the problem is so complicated that the risk of wrong prediction is substantial.



The logo of the lab illustrating the main concept of utilizing human genome information (figure taken from HGP webpage)



## Clemson High-Altitude Balloon Takes Flight

In April 2006 Clemson undergraduate physics and engineering students had their heads way above the clouds with the successful launch of TigerCUB , a large, high-altitude balloon and payload, that was two years in the planning. The project focused on mechanical and electrical design of space hardware, amateur radio and GPS, balloon tracking and recovery and atmospheric science.

Propelled by 14 pounds of helium, the high-altitude balloon rose 97,000 feet. A digital camera on board snapped photos of Lake Hartwell before the balloon burst, as planned, and tumbled into a Laurens County horse pasture. Three small radios transmitted GPS and Morse code signals to track its path and hunt it down. Onboard data loggers recorded pressure and temperatures while a student-built, programmable timer controlled the camera and other functions. Project adviser **Dr. Gerald Lehmacher** called the launch a great success.

“Despite all of the ground testing, there is a risk in a mission that goes to the ‘edge of space’. Receiving the pictures of the black sky above our blue planet was very rewarding. The position data were also posted in real time on the Internet, so people from many states followed the balloon”, said Lehmacher.

The NASA South Carolina Space Grant Consortium and Clemson University supported the project, with assistance from Clemson Apparel Research and the Clemson University Amateur Radio Club.

TigerCUB was launched for the second time on April, 23, 2007 from Kite Hill on the Clemson University Campus and recovered later in a pine forest near Clinton, SC. The 1200-gram weather balloon was filled with helium for a nozzle lift of over 9 lbs, and carried a similar payload as last year. A significant improvement was a cut-down system that severed the balloon about 75 minutes after launch, for a smoother descent by parachute. Adding to the excitement, the GPS stopped delivering positions near 65,000 ft on ascent. Thanks to the morse code beacon, we could determine the direction to the landing site, and soon we received the GPS position again. The recovery operation took a few hours, but was much fun...



Lining up for launch on the Clemson Tiger Band Practice Field.



View looking down from 95,000 feet on Lake Hartwell, South Carolina. At the top of the image are the cities of Clemson and Anderson, and Interstate 85



One happy recovery team: Daniel Hoffman ('06), Erik Pearson ('07), Stuart Bishop ('06), Phillip Martin ('07), Justin Ingersoll ('06), Clint Smullen ('07).

## Clemson Astrophysicists Celebrate Contributions of Ernst Zinner to Astronomy

Clemson Physics and Astronomy faculty professors **Drs. Dieter Hartmann, Brad Meyer, Professor Emeritus Don Clayton**, research associate **Dr. Lih-Sin The**, and graduate student **Allen Parker** attended the Zinner Impact Symposium at Washington University in St. Louis Feb. 3 and 4. This conference celebrated the 70<sup>th</sup> birthday of **Dr. Ernst Zinner**, a long-time collaborator of the Clemson astrophysics group.

Presolar stardust grains are blood-cell-sized dust grains that are recovered from primitive meteorites. Dr. Zinner has been a pioneer in applying the technique of secondary ionization mass spectrometry (SIMS) to the study of these grains and was among the first researchers to convincingly demonstrate that these grains are soot from stars that lived and died before our Sun formed. Understanding these grains from an astrophysical standpoint has long been a focus of the Clemson astrophysics group. For his pioneering work, Dr. Zinner has been awarded the Leonard Medal of the Meteoritical Society and the J. Lawrence Smith Medal of the National Academy of Sciences.

Following the Zinner Impact Symposium, Drs. Meyer, Clayton, The, and Mr. Parker attended the 17<sup>th</sup> Clemson/Washington University Workshop on presolar stardust grains, also held in St. Louis on Feb. 5 and 6. This workshop, which grew out of discussions between Clayton, Zinner, and the late Bob Walker of Washington University, has become an important venue for exchange of ideas about presolar grains. The workshop originally alternated between Clemson and St. Louis, but it has now grown to include participants from the University of Chicago, Argonne National Laboratory, the Department of Terrestrial Magnetism of the Carnegie Institute in Washington, DC, the University of Hawaii, and institutions in Europe and Australia. The next workshop will be in Chicago. In a tradition that dates back to the early days of the workshop, Clayton, Meyer, The, and Parker drove to St. Louis. This gave them an opportunity to discuss the science of presolar grains as well as to enjoy the scenery through northern Georgia, Tennessee, and Kentucky. Many alumni of the Clemson astrophysics group will no doubt remember this trip.



Ernst Zinner with Don Clayton (left)



Washington University Presolar Grains Workshop participants gather for a group photo

### *Don Clayton Inducted into Thomas Green Clemson Academy of Engineering & Sciences*

**Professor Emeritus, Donald D. Clayton** of Physics and Astronomy (pictured above), was inducted into the Thomas Green Clemson Academy of Engineering & Sciences at a banquet held at the Madren Center on April 11th. Membership in the Clemson Academy represents the very highest honor bestowed on Clemson engineers and scientists. Dr. Clayton was one of the three members inducted every year into the Academy. Candidates for selection into the Academy are judged on three criteria: conspicuous success in their career, significant contributions to society through professional or service activities, and notable contributions to engineering/science practice. Dr. Clayton is most renowned in his field for his advancement of the understanding of stellar nucleosynthesis.



## Clemson Professor & Student to Conduct NASA Project in the Cape Verde Islands

NASA is sponsoring the support of research in third-world countries as part of its outreach in connection with the International Heliospheric Year. This program commemorates the International Geophysical Year of 1957 which marked the period of extensive investigations of the Earth with new ground-based instruments and also including the flight of the first satellite, Sputnik. The aim of IHY is to support the training of scientists and engineers in modern instrumentation while extending the global infrastructure of geophysical instrumentation.

**Dr. John Meriwether** from Clemson University and **Dr. Jonathan Makela**, Assistant Professor of Electrical Engineering from the University of Illinois, have been funded to provide new instrumentation for two stations located in Cape Verde, a country composed of numerous islands and situated 250 km to the west of the western coastline of Africa near the geomagnetic equator. The instrumentation would observe the spatial structure of the nighttime red atomic oxygen emission from the atmosphere at 250 km height and also measure which way the air is moving, how fast, and how hot. This work is important to the

understanding of the complex ionospheric instabilities that cause radio communications to be disrupted from one night to the next. **Russ Hedden**, a Clemson junior physics major, would provide leadership in the deployment of the Fabry-Perot interferometers that would be installed at two stations located to the north and south ends of Cape Verde. Russ provided much assistance in establishing the Fabry-Perot network that Clemson installed in central Alaska last October with a follow-up visit in January.



Undergrad Russ Hedden with the FPI apparatus at Ft. Yukon, Alaska, a previous research site.

### Our Generous Donors, Charles Curry and Dr. Alston Steiner

The Physics Department is deeply indebted to two very generous donors, both of whom have facilitated significant programs and university collaborations, **Mr. Charles E. Curry** of Seneca, and retired Clemson Physics professor, **Dr. P. Alston Steiner III**. Mr. Curry is the 2007 recipient of the University's Algernon Sydney Sullivan Award and will be presented with this award at the spring commencement ceremony. His lifelong interest in astronomy and physics brought him to visit our department. Over the past few years, the Curry Foundation has given Clemson University over \$300,000 in funds, establishing several fellowships for Clemson graduate students, and funding Clemson's membership in the SARA telescope project and the University's new partnership in the Kitt Peak National Observatory telescope. He has also provided start-up funds for a faculty hire in the Physics Department.

Retired Clemson Physics professor Alston Steiner has also established an awards endowment in support of outstanding undergraduates. To date, the Steiner Family Foundation Scholarship Endowment has contributed \$75,000 towards building a generous endowment in support of undergraduate awards and scholarships.

It goes without saying that the contributions of these two individuals are greatly appreciated by the Department and the many students and faculty who benefit from their generosity.

### 2006-2007 Physics & Astronomy Student Awards

The Physics and Astronomy Department Awards Ceremony was held on Saturday April, 14, 2007 at the Clemson House to recognize outstanding students within our department. The 2006-2007 Department Award Recipients were as follow:

<i>Sigma Pi Sigma Senior Award</i> Greyson Gambrell	<i>L.D. Huff Junior Award</i> Robert Clarke Russell Hedden
<i>L.D. Huff Sophomore Award</i> Matt Henderson Laura Laughlin	<i>Outstanding Graduate Teaching Assistant</i> Huqin Zhang

In addition, the Department congratulates its 2006-2007 College of Engineering and Sciences (CES) Student Award winners:

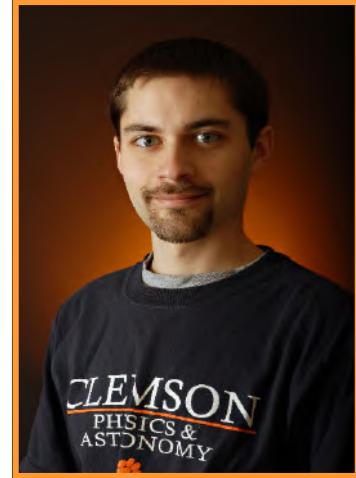
*Outstanding Junior Award in the Sciences*  
Justin Douglas Moody - Chemistry/Physics

*Outstanding Graduate Teaching Assistant*  
Huqin Zhang - Physics (she shared the award with Sajay Sadasivan— Industrial Engineering)

## Matthew Troutman Awarded Prestigious Michelson Fellowship

We are pleased to announce that **Matthew Troutman** has been awarded the Michelson Graduate Fellowship. Matt, a second year graduate student in the department of Physics & Astronomy and Curry Fellow, wrote a proposal to study gas in disks around young stars. He will measure the distribution of gas in planet-forming disks and use this information to determine whether there is an embedded gas giant planet in the young disk. By studying young disks, he hopes to catch the process of planet formation in the act and better understand how the solar system was formed and what might be its future.

Typically, only two to four Michelson Graduate Fellowships are awarded each year. In the past, these fellowships have been granted only to students from Berkeley, MIT, Princeton, Cal Tech, Arizona, Texas and Florida. This award is a testament to both Matt's proposal writing acumen and the world-class resources he now has available at Clemson.



Graduate Student, Matthew Troutman

The panel that reviewed Matt's proposal noted that the project was well organized, elegant and had a high likelihood of success. Further, they noted that the project took advantage of Clemson University's new collaboration with the National Optical Astronomy Observatory, and so they are confident Matt will be able to perform the observations he has proposed.

The commitment by the administration at Clemson to achieving Top Twenty status is reflected by their investment in basic research. An example of this commitment is Clemson's partnership with the National Optical Astronomy Observatory (NOAO) that provides access to the world's best telescopes. Clemson's commitment to basic research has resulted in unparalleled opportunities for our students at Clemson while strengthening the University's research infrastructure. Such investments do not occur without the generous support of alumni and other friends of the university, including Charles Curry whose Foundation provided the seed funding that made the Clemson-NOAO partnership possible.

## Featured Alumnus.....Leon Robinson, Class of 1949

In response to the Department's last newsletter, we received a very pleasant letter from Mr. Leon Robinson of the Class of 1949.

*Thank you for the Physics and Astronomy Newsletter ....Reading that document and visiting your website flooded me with nostalgia. I see that the old Physics Building, where I practically lived for many years, is now called Godfrey Hall. Just to the right of the front door, behind several display cases of Physics exhibits, was a small room that was assigned to four graduate students as an office. An x-ray machine was in the basement with a complete dark room for developing film. The main building, Tilman Hall, looks the same, as does Riggs Hall where most of the engineering courses were taught.*

*I received my B.S. in Industrial Physics from Clemson Agriculture College in Jan. 1949 and my M.S. in Physics in June 1950. I was a charter member of the Sigma Pi Sigma Physics Honor Society that was installed at Clemson in the spring of 1949. I followed Dr. A.C. Menius to N.C. State where I received my Ph.D. in Engineering Physics in 1954. The physics education brought me to Houston to work for Humble Oil and Refining Company research group. After 39 years with this group [Humble, Esso, Exxon], I retired in 1992. I currently teach some courses in drilling wells for hydrocarbons. My career is basically a validation of your website "welcome statement" that says: "It (referring to the BS in Physics) also provides a good background for graduate study or industrial work in many areas of engineering physics or applied science."*

## *In Memoriam*

### Clemson Mourns the Death of Student An-Hong Cheng



An-Hong Chen and fellow student Russell Lake



An-Hong Chen

An-Hong Cheng, 25, of Central, a graduate student in physics, died Saturday, November 4, 2006, in an accident on I-26 in Newberry County.

Originally from Taiwan, Cheng was a permanent resident of the U.S. His parents, Cheng Chun Ming (father) and Cheng Tseng Chi-Hsiu (mother) of Taipei, Taiwan, arrived in Clemson for a private viewing before cremation. A memorial service was held at 4:30 p.m. on Thursday, November 9, at First Baptist Church, 397 College Avenue in Clemson.

In lieu of flowers, the family requested that memorials be made to the department of Physics and Astronomy for graduate fellowships. Gifts should be made payable to the Clemson University Foundation, in memory of An-Hong Cheng, and sent to: P.O. Box 1889 Clemson, SC 29633-1889

### Fund Established for Physics Student, Kellie Jureka, Injured in CAT Bus Accident



Kellie Jureka

Clemson University's Society of Physics Students, in conjunction with Women in Science and Engineering (WISE) and the First Year Experience residents on west campus, has established a fund to help Clemson freshman **Kellie Jureka**, who was injured in an accident with a Clemson Area Transit Bus on campus February 13th. Jureka, a freshman physics major from Lexington, is being treated for her injuries at Greenville Memorial Hospital. The fund will help her family pay for medical expenses and other costs accrued during their extended stay in Greenville.

The Physics and Astronomy family was shaken and concerned when we learned of Kellie's serious accident. Kellie is an enthusiastic physics major, and we miss her cheerful presence in classes and hope for her speedy recovery, so that she can return to us", said Physics and Astronomy Department Chair, Peter Barnes. "The Society of Physics Students, the organization representing all physics and astronomy undergraduates, wants to help Kellie and her family in some way and is asking all who care to contribute to a fund established to aid the family with mounting expenses."

"I was in shock when I heard of the accident", said Brooke Baker, a freshman physics major and close friend of Jureka. Kellie is my friend and has many friends in the freshman class. I have visited Kellie in the hospital and was relieved to see she hadn't lost her bubbly personality, despite her injuries."

Kelly's family offered their appreciation to her friends and caregivers. "We wish to again express our heartfelt gratitude for the outpouring of support for Kellie from friends and family and for the exceptional care Kellie has received from Greenville Memorial Hospital and Greenville Hospital System Children's Hospital. We also ask that you not forget how difficult this time has been for everyone involved in this unfortunate accident and that you keep them in your thoughts and prayers as well."

## Meet Our Staff

**Amanda Crumpton**  
*Administrative Specialist*

**Celesté Hackett**  
*Student Services Coordinator*

**Debra Helvie**  
*Administrative Assistant*

**Risé Moroney**  
*Office Manager*

**Lori Rholetter**  
*Administrative Assistant*

**Bridgett Sloan**  
*Fiscal Analyst*



From left to right: Debra Helvie, Lori Rholetter, Amanda Crumpton, Risé Moroney, Bridgett Sloan, and Celesté Hackett.

*If you have any suggestions for this newsletter, or any other constructive input on its format, please email your thoughts to: [rvogt@clemson.edu](mailto:rvogt@clemson.edu)*

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