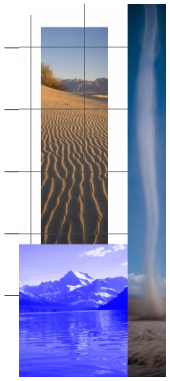


Schrödinger's Tiger

The Clemson University Physics and Astronomy Newsletter

Spring 2014 Volume 9, Issue 1

In this issue:

Dr. Apparao Rao Receives Governor's Award

Dr. Apparao Rao receives Governor's Award from Governor Nikki Haley on May 1, 2014 at the State House Rotunda

South Carolina Governor **Nikki Haley** has recognized three Clemson University professors for the global impact of their research in optical materials science, nanoscale physics and environmental nuclear chemistry.

Drs. John Ballato and **Apparao Rao** each received the 2014 Governor's Award for Excellence in Scientific Research. **Dr. Brian Powell** garnered the 2014 Governor's Young Scientist Award for Excellence in Scientific Research.

The governor presented their awards on Saturday May 1, 2014 at the State House Rotunda, subsequent to the winners speaking at the Academy of Science (SCAS) in Charleston on April 5th. The awards are e presented annually under the joint sponsorship of the Governor's Office and the Academy.

Rao is the R.A. Bowen professor of physics and the director of Clemson's Nanomaterials Research Laboratory. Haley informed Rao in a letter that his work at Clemson University has earned him the respect of his colleagues in the state and in the nation.

"You have contributed in tangible and meaningful ways to building our state's research infrastructure, increasing the visibility of South Carolina within the national and international scientific community while contributing to the teaching mission of our state," she wrote.

Rao said it is a great honor for his team to be recognized by the state for its research accomplishments, which have been presented at numerous scientific conferences over the past year. "While we've received several national and international accolades for our research and development, it feels a lot sweeter when it comes from our own state," he said.

(Adapted from: http://newsstand.clemson.edu/mediarelations/three-professors-win-governors-awards-for-world-class-research/)

A Message from the Department Chair

2013/14 was an excellent year for Clemson Physics & Astronomy. As you will see, our students and faculty received more than their share of awards. **John Farmer** is the seventh Goldwater Scholar in recent years in our small department. Our students nearly swept our college awards, and received multiple university-level awards. Our governor has a keen eye for research: **Dr. Apparao Rao** won the Governor's Award for Scientific Excellence. There is every reason to think we will have more excellent years ahead. We have hired five outstanding young faculty members in the past two years, two of whom are profiled in this edition. They are already doing great things. Including five lecturers, our faculty numbers thirty now, which is the largest we've been in recent decades.

The CUEBIT facility is operating and ready for more users. Although we would rather have them on the main campus, Dr. Rao's labs are now housed in a state-of-the-art facility for nanomaterial synthesis and characterization in Clemson's Research Park. The assistance of the South Carolina Research Authority and our Research Office was essential in this transition. We have more students involved in more kinds of research earlier than ever before. Their accomplishments will undoubtedly continue to fill these pages.

The Department of Energy completed a Title IX review of our graduate program this year. As many universities are just now becoming much more aware of the Title IX legislation, we are fortunate that we got a head start on the learning process. In our department we have not always handled all issues perfectly, but we do provide a positive environment for all. We, and all of Clemson University, now appreciate much better the need for vigilant education of everyone about providing the best possible atmosphere and opportunities for our sisters and daughters.

Dr. Mark D. Leising
Chair, Department of Physics and Astronomy
Voice: (864) 656-3416/email: lmark@clemson.edu

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. Endowments to Clemson assure the best faculty, the brightest students and the most creative research projects. A substantial endowment can transform a good university into a great one. As a non-profit organization, the Foundation is exempt from federal income tax under Section 501 (c)(3) of the1986 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.

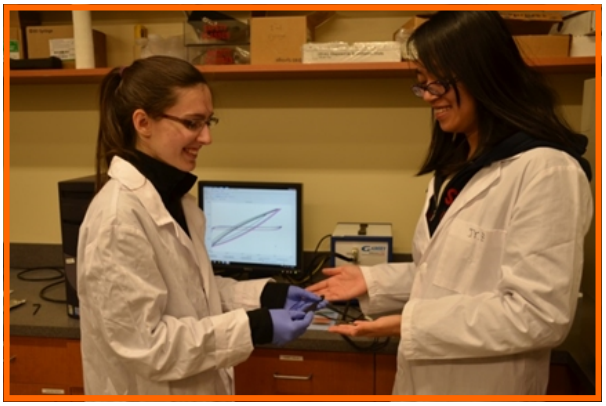
There are several ways to donate. You may use the enclosed envelope or send a check to the Clemson University Foundation, P.O. Box 1889, Clemson, SC 29633. Checks should be made payable to the Clemson University Foundation with Physics and Astronomy specified on the memo line. Alternately, you may visit the Clemson website: **http://www.clemson.edu/giving/how/** and make a secure electronic donation. Again, please specify that the donation go the Physics & Astronomy Department and indicate to which project you would like to donate. Thank you, as always, for your continued support of the Department. You may contact the Annual Giving Office at (864) 656-5896, should you have any questions regarding your donations. If you have other questions you may contact the Department directly at (864) 656-3416.

Clemson Nanomaterial Center Officially Opens

Dr. Larry Dooley, VP for Research cuts the ribbon during the inauguration ceremony for the CNC. From left to right: graduate student Deepak Saini, Dr. Apparao Rao, graduate student Jingy Zhu, and Dr. Malcolm Skove.

Dr. Larry Dooley, Clemson University's Vice-President for Research, recently inaugurated the new 4000 square foot research facility, the Clemson Nanomaterial Center (CNC), located in the Duke Energy Innovation Center at the Advanced Materials Research Lab (AMRL). Under the direction of **Dr. Apparao Rao**, this state-of-the-art facility is developing hybrid supercapacitors composed of carbon nanomaterials and biodegradable polymers. Several Clemson students actively participate in CNC projects, and, by working closely with our Physics and Astronomy Instrument Shop staff members, have developed scalable nanomanufacturing processes for hybrid supercapacitors.

Other research projects at CNC include spectroscopic and mechanical characterization of nanostructured materials with a view towards harnessing their unique electrical, optical, and mechanical properties in niche applications. CNC is host to undergraduate students enrolled in the Clemson Creative Inquiry (CI) program, and in fall of 2013 undergraduates **Olivia Layman** (pictured below), **Ben Shealy,** and **Paul Welsh** (not pictured) acquired hands-on experience in characterizing the mechanical and electrical properties of micro/nanomaterials. CNC has also hosted **Aleksandr Kakinen**, an international student from Estonia, who benefitted from CNC facilities for part of his doctoral dissertation on nanoparticle-protein coronas. **Dr. Ibrahim Belenli**, faculty member at Abant Izzet Baysal University in Turkey will soon be visiting CNC for his studies on the spectroscopic properties of thin films.

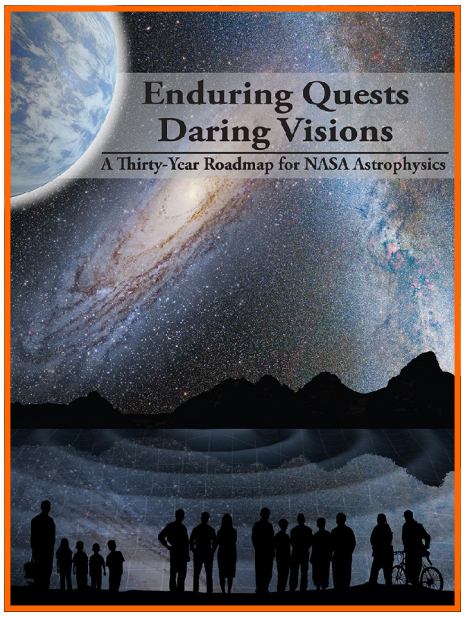


Clemson CI student Olivia Layman (left) and Jingyi Zhu prepare to test a carbon nanotube film for use in high performance supercapacitors.

Rao's research at Clemson University has been highly successful in the synthesis of nanomaterials. Some breakthrough technologies such as the continuous production of aligned MWNTs and low-melting metal oxide nanowires were discovered at Clemson.

Currently, his focus is on synthesis of doped single, bi- and few-layer graphene, graphene quantum dots (GQDs), Bucky Aerogel (BAG), and helically-coiled nanotubes and nanowires.

Enduring Quests - Daring Visions



"Enduring Quests, Daring Visions" is the title of a study that was recently completed in response to a call from NASA's Astrophysics Subcommittee (APS). The goal was to imagine a roadmap for a thirty-year period for NASA's space exploration in the area of astrophysics. The task force charged with this endeavor was chaired by **Dr. Chryssa Kouveliotou** of the NASA Marshall Space Flight Center in Huntsville, Alabama, and it consisted of two dozen researchers from institutions across the United States. From Clemson, **Dr. Dieter H. Hartmann** joined this effort. The group's final report can be found at:

http://go.nasa.gov/1gGVkZY

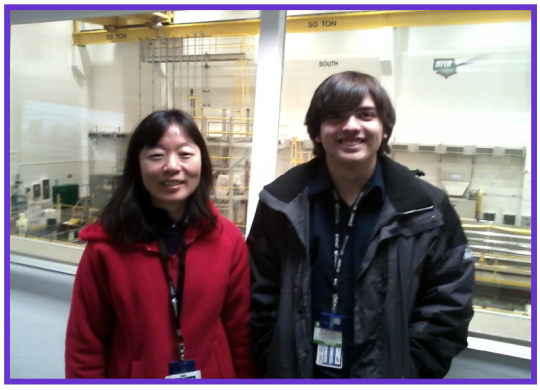
The total effort extended over slightly less than one year, and involved face-to-face meetings of the task force, town hall meetings at which the community presented their views, and many, many teleconferences of sub-teams designed to distill the daring vision for the future. The three big questions addressed in this report were: Are we alone? How did we get here? How does the Universe work?

These are big questions, and they have been around for a long time. The first question addresses life in the Universe. Now that astronomers have found thousands of planets in orbit around nearby stars, the next steps culminate in the desire to image some of these planets and to obtain spectra of their atmospheres. Finding evidence of continents, weather, and perhaps even chemical bio-markers such as abundant water are ambitious goals, but the task force believes that a few decades of dedicated technology development will get us there.

How we got here and how the Universe works are themes that involve the evolution of the Universe as a whole, from the inflationary early period after the Big Bang to the present galaxy-dominated large-scale structure in our cosmic neighborhood. They also address questions centered on the detailed physics that plays itself out in association with star formation and their final explosive end-stages, as well as the formation of planetary systems and the assembly of galaxies. Exotic conditions near neutron stars and black holes, and the even more exotic conditions of the ultra-early Universe are also the focus of this roadmap. Imaging the proximity of a nearby stellar mass black hole, or watching the assembly of super-massive black holes at the cores of essentially all galaxies has excited astronomers, as well as the high-resolution direct imaging of proto-planetary accretion disks and detailed studies of the polarization properties of the relic cosmic microwave background. The list is long, and the envisioned telescopes and detectors will need to be very powerful to answer these questions. The Universe is full of exciting phenomena and objects, begging us to study them in order to better understand our own role with this cosmic playground.

Just as the new television series "Cosmos" invites the public to come along on a journey with the help of a powerful spaceship, Dr. Hartmann and his fellow roadies invite you to read about our visions and to use your own imagination as a tool of exploration.

Michael Gagnepain Uses Oak Ridge National Laboratory's High Flux Isotope Reactor



Dr. Hye Jung Kang and Michael Gagnepain in the reactor control room during training

Michael Gagnepain, an undergraduate physics student, is learning how to synthesize materials under the supervision of **Dr. Jian He**. This January, Michael visited the High Flux Isotope Reactor (HFIR) at Oak Ridge, one of the world's best neutron-scattering facilities. He participated in a small-angle neutron scattering experiment with **Dr. Hye Jung Kang**. The experiment is to study microstructures and their interfaces in a filled thermoelectric Co4Sb12 system that also has a nanostructure impurity. When the Co4Sb12 system is filled with Indium atoms, nanostructure impurities are formed at higher concentrations. Various types of nanostructures generated by various methods improve thermoelectric efficiency by lowering thermal conductivity. Dr. Kang's experiment observes the evolution of nanostructures and their interfaces as a function of Indium concentration.

The core of the reactor

Grad Student Michael Bojazi's Paper Chosen as Physical Review C Editor's Suggestion

Graduate student **Michael Bojazi's** paper was chosen as a *Physical Review C* "*Highlight: Editor's Suggestion*." Michael is the graduate student of **Dr. Bradley S. Meyer**. Together they collaborated on the article, "Explosive nucleosynthesis of 15N in a massive-star model," which was published in the February 21, 2014 edition of the journal.

In their paper, Bojazi and Meyer explored the nuclear reactions occurring in the helium-rich shell during the explosion of a massive star by using a simple, but realistic, model of shock propagation. The helium-rich layers are likely important source material for supernova graphite presolar grains recovered from meteorites, and 15N is an important diagnostic of the nucleosynthesis that occurs in these shells.

Michael Bojazi

By studying the sensitivity of the yield of 15N to reaction rate uncertainties, the work by Bojazi and Meyer suggests interesting targets for future nuclear physics experiments. Bojazi and Meyer also provide detailed instructions on how to download, install, and run all the calculations they present.

This work is part of a larger effort by Meyer and his students to make a large suite of nuclear astrophysics codes available for general use. To access Meyer's website, please visit: **http://sourceforge.net/u/mbradle/blog**

The Department Welcomes Two New Faculty Members

Dr. Hugo Sanabria joined the Department of Physics and Astronomy in January of this year. He graduated from Tec of Monterrey, Mexico with a B.S. in physics engineering and pursued a M.S. and Ph.D. in physics at the University of Houston under the supervision of **Dr. John H. Miller**. His work focused on the application of dielectric spectroscopy to study the electrical response of polyelectrolytes, in particular the study of cytoskeletal filaments like microtubules. Dr. Sanabria was awarded an NIH training fellowship to follow his postdoctoral research with **Dr. M. Neal Waxham** at the University of Texas Health Science Center in Houston. There he studied Ca^{2+} signaling proteins involved in learning and memory processes at a single molecule level. Later, he was awarded an Alexander von Humboldt fellowship at Heinrich Heine University in Dusseldorf, Germany under the supervision of **Dr. Claus Seidel**, where he developed and enhanced single molecule methodologies to study structure and dynamics of proteins — technology he now brings to Clemson University. The experimental set-up used to study single molecules is one of a kind in the United States, pioneering structural determination of biomolecules using fluorescence methodologies. Among the various projects that Dr. Sanabria studies are protein folding dynamics, intrinsically disordered proteins, and enzyme catalysis — all with single molecule sensitivity.

Dr. Hugo Sanabria

Dr. Marco Ajello during a visit to San Francisco

Dr. Marco Ajello comes to Clemson after a position as a Research Scientist at Berkeley University from 2008 to 2012. His research focuses on cosmology and extragalactic astrophysics. Marco has always been interested in the evolution of super-massive black holes and on the origin of the diffuse cosmological backgrounds. Very recently, he turned his attention towards the role of the first stars during the epoch of the re-ionization. He believes that future prospects for probing primordial star formation scenarios are excellent. Important side products of this investigation will be the measurements of the expansion rate of the Universe and of the intensity of the intergalactic magnetic field.

From 2007 through 2008, he was a Research Associate at Stanford University, previously having done a postdoctoral fellowship at the Max Planck Institute for Extraterrestrial Physics. Marco is also a member of the Swift Collaboration.

Originally from Palermo, Italy, he completed his undergraduate degree in mechanical engineering at the University of Palermo, his Masters in particle physics at the University of Trieste, and earned his Ph.D. in astrophysics from the Technische Universiät in Munich, in 2007.

Research during Sabbatical at the National Institutes of Health Helps to Improve Calculation of DNA Variants

By Dr. Emil Alexov

The National Institutes of Health (NIH) is the place where I always wanted to spend a sabbatical. NIH is the largest center for biomedical research in the country, and it provides cutting-edge technologies and resources, encouraging scientists to explore non-standard approaches. This is the place where you can walk along the hallway and bump into prominent researchers in the field. Every day there are seminars and conferences, and sometimes it is difficult to make up your mind which one to attend, since all of them are interesting. NIH is truly inspiring, and its stimulating environment can make you re-think your old ideas and provoke you to take the challenge of starting something completely new.

Dr. Emil Alexov (center) with colleagues at the Computational Biology Division at NIH

I have always been fascinated by the possibility of working at the boundary between physics and life sciences. While biological macromolecules are very complex objects and are involved in many interactions and reactions, basic forces still govern these phenomena, and they are forces described by the laws of physics. Why shouldn't we engage physics together with other sciences to explain one of the major challenges of our time: how our genetic information encoded in our DNA reflects our health and predisposition to diseases? Obviously, this is not a task that can be accomplished by one lab or a particular institution. This enterprise requires the combined efforts of many researchers from different fields.

In an attempt to contribute to this effort, our lab is developing methods and computer codes to predict the effect of DNA variants on the binding free energy of macromolecular complexes and the folding free energy of individual macromolecules. For practical purposes, the method should be able to calculate the effect of many DNA variations and to be accurate at the same time. This made us turn our attention to the so-called Linear Interaction Energy (LIE) approach. This approach calculates various energy components associated with the phenomena being studied and uses experimental data to deliver the optimal weight coefficient for each energy term.

This project started last year with my student **Margo Petukh's** internship at NIH, resulting in a methodology which outperforms all existing methods, but is ultimately too slow. For predicting the effect of a single DNA variant, the computer takes at minimum a half day to complete the task. Such an approach cannot be used for large-scale predictions. With my visit to NIH and work within the Computational Biology Division, I am revisiting this approach in order to make it much faster, while keeping the accuracy uncompromised. This has required rethinking our strategy and invoking different formulations of the energy components. The initial results are promising, and, while not as good as I was hoping, I am confident that by the end of my visit (or shortly thereafter) we will be able to achieve the goal. Once the methodology is proven to work and achieves the desired accuracy and speed, it will be utilized on a webserver that will be implemented at NIH and Clemson University. Having the Clemson logo at a server residing at NIH will definitely enhance Clemson University's reputation in this field.

Organizing the Gordon Research Conference on "Human Single Nucleotide Polymorphism and Disease"

In the summer of 2014, **Drs. Emil Alexov** of Clemson and **Anna Panchenko** of the Computational Biophysics Group at the National Institutes of Health will be organizing the Gordon Research Conference (GRC) on "Human Single Nucleotide Polymorphism and Diseases." The meeting will be held at Stonehill College, located in the small town of Easton, Massachusetts, which will hopefully provide a quiet country atmosphere for a successful meeting. Information on the meeting can be found via the following link: **http://www.grc.org/programs.aspx?year=2014&program=human**

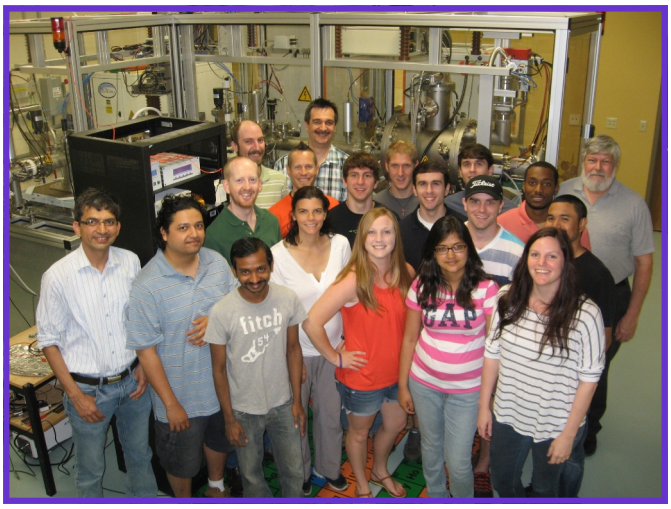
In Alexov's scientific career he has organized various scientific meetings, but he is now realizing that organizing the GRC is a completely different and much more difficult task. The first question to address is who to invite to give a talk. Since GRCs are very prestigious, getting speakers is not an issue, but what if you forget to invite some of your friends or prominent scientists in the field? GRC policy is to encourage long talks, and, because of that, typical GRC programs have five or six talks per day, resulting in fewer than twenty-five speakers in total. Selecting these individuals is a tough job — especially from a research field with a large population.

The conference will cover various aspects of the relations between human DNA variations and the susceptibility to diseases. How and why is a given DNA variant harmless and results in natural differences between individuals (such as hair color or ability to understand quantum mechanics), while another causes disease? What is the molecular mechanism that makes them have such distinctively different effects on our being? Currently many computational and experimental methods have been developed to estimate the effects of mutations on proteins. Computational approaches are available to estimate the folding or binding free-energy change of mutants using detailed atomic models, empirical or statistical potentials.

Stonehill College will host the 2014 Gordon Research Conference.

Large-scale mutagenesis, alanine scanning, biochemical, and structural studies assess the experimental effects of mutations and amino acid substitutions on conformation, activity, and function of proteins. Discussion of new developments and new approaches in this field will be one of the main topics of this Gordon Conference.

The conference will bring together people who work on diverse experimental and computational aspects related to inferring and analyzing the effect of human mutations on protein function and their role in cancer-causing and rare diseases. Hopefully, the conference topic will help to advance the field by merging genomics and proteomics approaches, and by bringing together scientists who work on the same problems from different perspectives. Alexov and Panchenko especially hope that it will provide a stimulating environment where students, postdocs and junior investigators can present and discuss their research with the best minds in the field. They hope the meeting will have significant impact on the research and development in the field of genetic variations and rare mutations and have designed a meeting agenda to include researchers from the United States, Europe, and Asia, representing both basic and applied research in the field.



Front: Radhey Shyam, Dhruva Kulkarni, Endu Srinadhu, Dr. Joan Marler, Kristyn Brandenburg, Rosahni Silwal, and Amy Gall; Back: Dr. Chad Sosolik, Daniel Field, Kevin Wilson, Dr. Endre Takacs, Taylor Kimmel, Kevin Ferri, Adam Klingenberger, Jared Klingenberger, Donald Medlin, Jonathon Miller, Yamil Ruiz, and Dr. Jim Harriss

EBIT is Up and Running

The Department's new user facility (CUEBIT), which is based around an electron beam ion trap, is now up and running. **Drs. Chad Sosolik** and **Endre Takacs** and their research groups have commenced the first experiments at CUEBIT. For Dr. Sosolik, this has involved DARPA-funded work on the role that multi-charged ions play in the delivery of electronic energy to carbon-based targets with a goal of using these ions as a tool for low temperature chemistry in thin film growth. Dr. Takacs has made the first x-ray measurements from highly charged ions in the source, looking at their spectra as a function of introduced gas pressures. These data are shedding light on the trapping mechanisms within our EBIT and are being shared with our German colleagues at DREEBIT, GmbH to aid in future source designs. Both professors are also working to bring researchers from around the U.S. and the world to Clemson University to perform new experiments with our source. As part of this effort, a large group of Clemson faculty, graduate students, and undergraduate students will travel to the 12th International Symposium on Electron Beam Ion Sources and Traps, which is being held at the National Superconducting Cyclotron Laboratory at Michigan State University this summer.

Two Fabry-Perot Interferometers Deployed in Ethiopia

Dr. John Meriwether and his atmospheric physics team have received funding from the Air Force Office of Scientific Research for the construction of two Fabry-Perot interferometers: one to be deployed at the Mt. Entoto Astronomical Observatory overlooking the Ethiopian capital of Addis Ababa and the other to be located on the campus of Bahir Dar University, on the shore of Lake Bahir Dar, some 200 miles northwest of the capital.

A crane lowers the Fabry-Perot interferometer into place at the Mt. Entoto Observatory in Ethiopia.

The two instruments will provide common volume measurements in the thermosphere region at 250 km altitude, where the two horizontal wind components, zonal and the meridional, will be measured using the Doppler Shift. This shift is observed for each line-of-sight from each instrument into the common volume region of the oxygen redline nightglow layer. Dr. Meriwether's students, **Sam Sanders** and **Rafael Mesquita**, will be part of the deployment effort to install both instruments. This research and deployment effort has been funded by the National Science Foundation.

The Department Remembers Dr. John Isbell

John Thomas "Doc" Isbell, Ph.D., husband of Karen McQuarter Isbell, died on Wednesday, September 25, 2013. Dr. Isbell was born in Bangor, Maine to the late Hal Gene Isbell and Mary Lynn Cole Isbell. He was an alumnus of Clemson University and a professor of physics at Greenville Technical College. Surviving, in addition to his wife, are a stepson, Larry Preston; a stepdaughter, Shawn Preston; a brother, James "Izzy" Isbell; a sister, Pat Isbell; and two grandchildren, Isaac and J.R. Preston.

John was an undergraduate in physics at Clemson in the early 70s. After obtaining his Masters in physics at Clemson, he worked briefly at Huntsville, eventually returning to Clemson to get his Ph.D. He worked with **Dr. Phil Flower** for his doctorate, completing his research on stellar evolution in clusters and galaxies in 1989. He taught at Piedmont Technical College in Greenwood, South Carolina for several years, and then later assumed a teaching position at Greenville Tech. He was well liked by his students and known to be tough but fair. Most importantly, he genuinely wanted to teach them physics.

Dr. Mark Leising Inducted into the Thomas Green Clemson Academy

Clemson University alumni and faculty were honored at the nineteenth annual College of Engineering and Science banquet.

Three of the honorees, including **Dr. Mark Leising**, Physics and Astronomy Department Chair, were inducted into the Thomas Green Clemson Academy, the college's highest honor. Three others were recognized as Outstanding Young Alumni. The banquet was held at the Madren Center on April 24.

From left: CES Dean Anand Gramopadhye with Academy inductees James Albritton, Mark Leising, and Robert Skelton

A highlight of Leising's career was the discovery of gamma-ray line emission from radioactive cobalt-56 and cobalt-57 nuclei in supernova 1987A. This event provided the first explicit proof of explosively-produced radioactive nuclei in supernova explosions, a proof that had been sought since **Fred Hoyle** created the theory of nucleosynthesis in stars.

Leising was recognized for predictions and measurements of gamma rays and X-rays from radioactivity produced in supernovae and classical novae. He and colleagues made the first maps of the Milky Way in electron-positron annihilation gamma rays. He first published the idea that radioactive debris of stellar explosions could be measured with X-ray telescopes, which has since been realized. With graduate student **Ken Watanabe**, he made the first accurate measurement of the cosmic gamma-ray background at MeV energies. Student **Peter Milne** and Leising first measured the escape of positrons from supernova explosions. As a Clemson professor, Leising has advised eight Ph.D. graduates, supervised ten Masters theses, and has been a research advisor for twenty undergraduate students, in addition to his responsibilities as Department Chair.

(Adapted from: http://newsstand.clemson.edu/six-honored-by-college-of-engineering-and-science/)

Awards Ceremony Highlights P & A Student Successes

Each year, a number of Physics and Astronomy students receive departmental awards of recognition, as well as awards and scholarships at the national, university, and college level.

This year both the department and college awards were presented on March 28th. Clemson Physics and Astronomy students continue to garner signification recognition in their respective fields. The winners are as follow:

National Scholarships

Barry M. Goldwater Scholarship - 2014
Astronaut Scholarship Foundation - 2014
John Farmer

Astronaut Scholarship Foundation - 2013
Brenden Roberts

Chair Mark Leising presents Emily Thompson with the L.D. Huff Junior Award.

Departmental Awards for 2014

Outstanding Graduate Researcher, **Nick Geitner**; Outstanding Graduate Teaching Assistant, **Evan Figg**; L.D. Huff Junior Award, **Emily Thompson** & **John Farmer**; L.D. Huff Sophomore Award, **Jacylyn Schmitt** & **Jeremy Glick**; Erin Samantha Cawthorne Award, **Emily Thompson**; Society of Physics Students' Senior Award, **Charles Tupper**; and, the Henry Odom Scholarship, **Jacob Covington** and **Nickalas Reynolds**.

Department awardees celebrate their successes.

University-Level Awards for 2014

Outstanding Graduate Researcher Award,
Dale Hitchcock

College-Level Awards for 2014

CES Outstanding Graduate Researcher,
Dale Hitchcock

CES Outstanding Senior in the Sciences,
Brenden Roberts

CES Outstanding Junior in the Sciences
John Farmer

Awardees, friends, and family await the ceremony.

The Clemson University Physics and Astronomy Newsletter

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Department News

Dale Hitchcock and his fiancée Kayla Mennetti were married on March 29th. Dale is the graduate student of Dr. Jian He and is expected to graduate with his Ph.D. in August of this year.

Office Administrative Assistant Debra Helvie is a new grandmother! Deb's son Bryant and his wife Claire had a baby girl, Kinsley Kate Helvie, on May 13th.

Dr. Jian He will be promoted to Associate Professor with tenure, effective August 15th. He is a professor of experimental condensed matter physics and joined the Department in the spring of 2008.

Dr. Jens Oberheide will be granted tenure, also effective August 15th. Oberheide is part of the atmospheric physics group in the Department and focuses his research on satellite data analysis, climate and weather of the Sun-Earth system and atmospheric tides. Oberheide joined the Department in spring of 2010.

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