OVPR, Physics & Chemistry lectures host prominent speaker at Baylor

Dr. James M. Tour, T. T. and W. F. Chao Professor of Chemistry, Professor of Computer Science, and Professor of Mechanical Engineering and Materials Science at Rice University, visited Baylor on February 12-13. His visit was jointly sponsored by the Department of Physics, the Department of Chemistry, and the Office of the Vice Provost for Research. An eminent synthetic organic chemist, Dr. Tour has over 475 publications with over 32,000 citations, as well as more than 60 patents. He is a gifted teacher, researcher, and entrepreneur, and recent awards include the ACS Nano Lectureship Award from the American Chemical Society (2012), his election as Fellow of the American Association for the Advancement of Science (2009), and his ranking as one of the Top 10 chemists in the world over the past decade, based on a Thomson Reuters survey of citations per publication (2009).

His visit kicked off Tuesday evening with a public lecture on “Nanocars and the Power of Scriptures in a Professor's Life.” While spending about one third of the talk on his ground-breaking construction and manipulation of nanocars, the bulk of the presentation was spent on his personal testimony and relationship with Jesus Christ. He spoke extensively about his meditation on Scripture and prayer and the impact of those on his professional and personal life. After the talk, he fielded questions from the audience, which was comprised of students, faculty from across the university, and members of the greater Waco community.

Professor Tour also delivered a joint Physics/Chemistry/OVPR colloquium on Wednesday, "Carbon Nanomaterials: From Nanodevices to Nanomedicine." This presentation highlighted his group’s accomplishments in graphene and carbon nanotubes and a variety of applications of these materials, particularly in medicine. During his visit, Dr. Tour enjoyed visits with faculty from Physics, Chemistry, and Engineering, as well as a tour of BRIC and a visit with Judge Ken Starr, Provost Elizabeth Davis, and Vice Provost for Research Truell Hyde.

Faculty member obtains EAGER funding from NSF

The National Science Foundation (NSF) on March 1 awarded Dr. Linda Olafsen an Early Concept Grant for Exploratory Research (EAGER: Enhanced Optoelectronic Devices Through Integration of Single-Crystal Graphene and Bernal Bilayer and Trilayer Graphene). This project is in collaboration with Dr. James Tour of Rice University, and his visit (detailed above) arose following a summer visit by Dr. Linda Olafsen and her Ph.D. student Jeremy Kunz to discuss this new process. Their objective is to employ graphene transparent electrical contacts atop mid-infrared semiconductor lasers to determine the fundamental physical mechanisms that critically limit high-temperature operation. Thin, transparent contacts with high mobility and excellent heat dissipation may have extensive applications in optoelectronic devices.
Dear Friends,

Spring has definitely burst forth on the Baylor campus! It seems as if we had no winter at all this year. Every two years or so we place orders for Physics fleeces (or phleeces!) embroidered with the department logo. This year we placed the order in mid-January, surely early enough to be useful in those February and March cold snaps. The fleeces arrived, but not the cold weather! It’s a little sad seeing folks proudly wearing new fleeces when it is 70 or 80 degrees outside!

Anzhong Wang is our very dedicated coordinator for the Wednesday afternoon Physics Department Colloquium, while Linda Olafsen has responsibility for the Friday afternoon Graduate Colloquium. Both do outstanding jobs in providing speakers on a variety of physics topics. In addition, we try to bring in a special speaker every year to present both a scientific talk and a public talk on faith & science. This semester we have had two such speakers. Dr. Martin Gaskell, an observational astronomer from the University of Valparaiso, Chile, (and Baylor parent) visited the department January 23-24. Dr. Gaskell’s scientific talk was on active galactic nuclei and supermassive black holes. His public talk was entitled, “How Scientists View the Big Questions about the Universe.” Dr. Jim Tour of Rice University visited the department February 12-13. Prof. Tour’s scientific lecture was on carbon nanomaterials, while his public lecture was on “Nanocars and the Power of Scripture in a Professor’s Life.” All were well received!

Construction continues apace at the new Baylor Stadium site just across the Brazos River from the main part of campus. With the exception of the President’s home, all of the houses in the “Fort Faculty” area have been removed, and the area is now very much a wooded park. Recently the university announced plans to build a new business school at the edge of this area along Bagby Avenue. Soon you will need a tour guide to find your way across campus!

On the funding front, we received the good news this week that Linda Olafsen’s EAGER (EArl concept Grants for Exploratory Research) proposal has been funded by the National Science Foundation. That is quite an amazing breakthrough in this age of limited funding and sequestration! The project with Rice’s Jim Tour aims to apply transparent graphene contacts to semiconductor lasers, so that they may be electrically biased, even as they are being optically pumped. As the reviewer states, “This project represents a transformational approach to mid-infrared lasers and potentially a broad range of optoelectronic devices.”

Later this month the department will hold its third annual Open House recruiting event for PhD applicants. Our most qualified applicants are selected for an invitation to campus to introduce them to our program and to the various research opportunities available here. While we continue to tweak the schedule a bit, we have had good success in increasing the rate of offer acceptances among those who come to the Open House event.

Thank you for your interest and support. If you are so inclined, one of the best ways to support the work of the department is through giving to the Physics Excellence Fund. Please continue to pray with us that we honor God in all of our work, and that we accomplish goals that are pleasing to Him. If you find yourself in the area later this spring, please stop by and say hello.

With warmest best wishes,

Greg Benesh, Professor & Chairman

“Please continue to pray that we honor God in all our work.”
The Baylor University Physics Graduate Program is pleased to announce its second annual open house for prospective graduate students, to be held March 22-23, 2013. You are invited to attend to learn more about the graduate program in physics. Particularly, students will be given the opportunity to

• Visit the department and various labs in the Baylor Science Building
• Talk with faculty and students about the graduate program and research opportunities
• Learn about financial aid and scholarships
• Tour the campus
• Have dinner and socialize with fellow Physics students enrolled in the program

The Open House will take place primarily in the Baylor Science Building.

2013 Baylor Physics Open House Tentative Schedule

**Friday, March 22, 2013**
3:00pm – 3:15pm Welcome & Orientation
3:30pm – 4:30pm BRIC Tour
4:45pm – 6:00 pm Poster session
6:00pm – 6:45pm Dinner (Atrium)

**Saturday, March 23, 2013**
8:30am – 9:15am Continental Breakfast (Room E301)
9:15am – 10:50am Individual Meetings with Research Faculty
10:50am – noon Science Building Lab tours
noon – 1:30pm Lunch on campus
1:45pm – 2:15pm Final Question and Answer Session (E301)

Other Graduate Program reminders!

Just a reminder from the Graduate School concerning reporting on all our graduate student talks, not just ones that have received Graduate School travel support. If there were talks given by your graduate students during summer or fall 2012, or spring 2013 please include them in the appropriate form to Marian.

This is also a reminder to please submit information regarding the Physics department’s doctoral student publications from Fall 2012. We are hoping to complete our Fall 2012 list of doctoral student publications. The plan is for each doctoral program’s Graduate Program Director or assistant to submit the completed spreadsheet form via email after the end of each semester. The data that we collect throughout the year will be submitted to IRT in June in order to be included on the next update of the Program Profiles. At this time make sure all grad student publications accepted/published during Fall 2012 have been properly reported to Marian Nunn-Graves.
Bobby Joe Farmer, age 80, of Gatesville passed away peacefully on Monday, January 28, 2013. Bob was born at his beloved home on Farmer Road in Aledo, Texas, to the late Maurice (Cap) Farmer and Katherine (Kate) Farmer. One brother, Clifford Maurice Farmer, precedes him in death.

He grew up on a large dairy farm in Aledo, where he began working with his father as soon as he was old enough to stay out of the way and continued during college, working summers all the way through his time at Rice University. Bob was valedictorian of his graduating class of Aledo High in 1950, he graduated valedictorian at Weatherford junior College where he received his A.A. and he also enjoyed playing basketball, graduated Summa Cum Laude from Texas Christian University with a B.A. in Mathematics and Physics. He received his M.A. in Physics from Rice University and earned his Ph.D. in Nuclear Physics in 1959 from Rice University. He soon became Manager of the Nuclear and Space Physics Group at LTV Research Center in Dallas where he worked closely with NASA on many projects, one being his patent for radiation detection flight hardware that flew on Gemini XII, at Jim Lovell's elbow, and is now in the Smithsonian Institute in Washington D.C. He also applied at NASA to be an astronaut. Out of 936 Ph.D. applicants, he made the cut down to 66, of which they took 11. Allen Shepherd called one morning to inform Bob that out of the 2 Ph.D. nuclear physicist applicants, they had selected the younger with no medical background. Bob later became Senior Staff Scientist in charge of space programs at Radiation Research Associates in Fort Worth, Texas. He went on to receive several more patents, had many papers published, and was very involved in many environmental projects, both individually and through the Institute of Environmental Studies at Baylor University and the list goes on. He retired due to his health, in 2008, after teaching Physics for several years at Baylor University.

Bob was a perpetually optimistic, truly generous man. He was always there to help, he knew how to be a good friend, he was kind and patient, always gracious and he never complained. In his younger days, he enjoyed dove and deer hunting. As the years passed, he really preferred watching the “critters” rather than shooting them. In his youth he loved his horses. He says he was quite bow-legged when he was young from riding so much and if he were not riding, he was running. As a boy, he had his own workshop and started building, exploring and inventing at an early age. Bob was an exceptional man who will be sorely missed. He is survived by his wife, Martha (Bratton) McCoy Farmer, children, Gary Farmer and wife, Barbie, of Austin, Debbie Farmer of Springtown, Texas; step-children, Kimberley McCoy Watson and husband David of Jonesboro, Craig McCoy and wife Tanya of Gatesville; 10 grandchildren, Doug Farmer and Elizabeth Farmer of Austin, Alison Morantes of Springtown, Megan Watson of Gatesville, Karrie Nicole Miller of Jonesboro, Benjamin Miller and fiancé Bailey, of College Station, Texas, Allan Watson, of Clarksville, Arkansas, Matthew Elliott and wife Amanda, of Gatesville, Larrett McCoy and wife, Lana, Luke Air Force Base, Surprise, Arizona, Kyle McCoy and fiancé, Natalie of Gatesville, and 8 precious great-grandchildren and many loving cousins, nieces, nephews and friends.

The family especially wants to thank Joy Schwalbe and her loving staff at the Rocking Ranch in Jonesboro. Bob was happy there for almost 3 years. He (we) loved them like family and the feeling was mutual, as exemplified by their tender and committed care for him. The family will be forever grateful to them for helping us through this difficult time. Thanks, also, to the very caring folks from CCS Hospice. Memorials may be made to First United Methodist Church, 2600 E. Main St, Gatesville, TX, 76528. Parkinson's Disease Foundation, 1359 Broadway, Suite 1509 New York, NY 100018 or American Diabetes Association 9430 Research Blvd Bldg. 2 Ste 150 Austin, TX 78759.
Astrophysics major Roshelle Patterson (second from right) at the South Central Conference for Undergraduate Women in Physics (SCUWiP) at the University of Texas in Austin held January 18-20, 2013. She is pictured with Dr. Risa Wechsler (far right) from Stanford University and other undergraduates participating in the conference.

Christlynn Henderson and Samantha Simpson, also Baylor astrophysics majors, attended the conference as well!

Christlynn Henderson and Samantha Simpson, also Baylor astrophysics majors, attended the conference as well!

URSA is coming! URSA is coming!

Dear Colleagues,

The annual Undergraduate Research and Scholarly Achievement (URSA) Scholars Week has grown each year since its initiation as Scholars Day in 2008. I am emailing to solicit your help in recruiting students to participate in the 2013 Scholars Week, which will take place April 8-11, 2013. Students may orally present research at the Bill Daniels Student Center on Monday, April 8 or Tuesday, April 9, or they may present research posters in the Baylor Sciences Building on Wednesday, April 10 or Thursday, April 11.

Please feel free to contact me or Julia Bales, URSA Administrative Associate at Julia_Bales@baylor.edu or extension 7594 for more information about the event. We look forward to receiving many wonderful submissions!

Susan Bratton — Director, Undergraduate Research and Scholarly Achievement

Habitat for Humanity: Applied Physics!

Physics folks helped out on the Habitat workday on Saturday at 1417 Gurley Ave. We helped put up OSB siding and worked on other parts of the new house. This house is a collaboration of Baylor Habitat Chapter, a Baylor fraternity (KOT), and a grant from Farmer's Insurance. Thank you to all the physics participants. It was a true blessing to participate!
Left: The Olafsen family takes part in the mile fun run in January (Susanna was off camera in her stroller to the left. Photo courtesy of Jared Greenwald) Center: Chava Baker’s son Joel and his wife, Ana, were married on January 7, 2013. Right: Alumni David George, now at University of North Texas presents a paper at the SPIE conference in San Francisco. Below: Several physics department faculty attended the Regents’ reception on February 7, 2013. Extra credit if you can find them all!
Out and About …

Baylor University service awards were presented to several members of the department on February 19, 2013. Being recognized for years of service were Chava Baker (10), Linda Kinslow (10), John Vasut (10), Ken Park (15), Marian Nunn-Graves (20), and Greg Benesh (30). Congratulations and thank you for your years of service!

Dr. Gerald Cleaver has been appointed as a problem contributor to the 2013 AP Physics BC Exam. During December he wrote several multiple choice and free response problems in electromagnetics for inclusion in the problem bank from which questions for the 2013 exam will be chosen. Douglas Moore, Jared Greenwald and Dr. Cleaver submitted their article “Gauge Models in D Dimension” to Modern Physics Letters A.

On February 14, 2013, Dr. Jay Dittmann visited LeTourneau University in Longview, Texas and presented a science seminar on experimental high energy physics including the latest news on the Higgs boson. Approximately 90 undergraduate students attended the presentation. Dr. Jay Dittmann attended the 43rd Winter Colloquium on the Physics of Quantum Electronics from January 6–10, 2013 and presented an invited plenary presentation on the Higgs boson discovery at the Large Hadron Collider. Dr. Jay Dittmann and Dr. Kenichi Hatakeyama received a Department of Energy grant award totaling $233,000 for experimental high energy physics research for the budget year April 1, 2013 to March 31, 2014. The award provides funding for research on the CMS experiment at CERN and the CDF experiment at Fermilab.

Dr. Linda Olafsen presented an invited paper, “Tunable excitation of mid-infrared optically pumped semiconductor lasers,” at SPIE Photonics West on February 7, 2013. Former Baylor Physics undergraduate David George, currently a graduate student at the University of North Texas, was also at the conference. David presented a talk titled “Holographic fabrication of nano-optical devices using single reflective optical element.”


Dr. Anzhong Wang attended the international meeting, KAVLI IPMU FOCUS WEEK ON GRAVITY AND LORENTZ VIOLATIONS, FEB 18-22, 2013, and invited to give a talk on “Non-projectable Horava-Lifshitz Theory with an Extra U (1) Symmetry.”


Dr. Zhenrong Zhang visited the Department of Physics at Trinity University and presented a talk on February 5, 2013. The title of her talk was “Catalytic reactions on rutile TiO₂(110): a direct view at atomic scale.” This visit is part of the Baylor University Department of Physics Speaker Outreach Program.

In your prayers, please remember Bethani Stanford, who has been working diligently these last several years in the Office of Sponsored Programs at Baylor University on behalf of all of us in Physics who apply for grants and external funding. She has recently suffered a setback in her battle with cancer and could use the benefit of all of us praying for her and her family. A dinner benefit will be held for her on Sunday, March 17 from 1 - 7 pm at Crawford Community Center, Tonkawa Park. A fund for the family has also been set up at Security Bank of Crawford in Bethani’s name.
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