The University of Toledo College of Arts and Science

Department of Physics and Astronomy

WAVES

http://www.physics.utoledo.edu

Number 11 December 2007

Department Chair's Comments

It seems as though we just finished the last Waves newsletter, but a year has already passed. Last year at this time we were writing about the merger of UT with the former MUO, about four faculty and two staff retirements, and about several new faces in the Department. Last year the retirees were "lying low," as required by the Early Retirement Incentive Program (ERIP), but this year Adolf Witt, Dave Ellis, and Larry Curtis are back doing some critically important teaching and research in the Department. Phil James is continuing his active Mars research program but mostly now from Prescott, Arizona. Meanwhile, we have welcomed Rupali Chandar as she starts her new astronomy position, and we look forward to the January arrival of J.D. Smith who will complete, with Tom Megeath, the trilogy of new astronomy hires in the Provost's cluster hiring plan, now often referred to as the 10x10 plan—10 new tenure-track faculty across the main campus in each of 10 years starting in 2005. On the physics side of the Department, we have extended offers to two outstanding candidates. One for an endowed chair in PV associated with the new Wright Center for PVIC and based on the Phil James position. The second position is in ultrafast laser spectroscopy of materials. The latter position would complete, with Sylvain Marsillac, the two thin films and coatings positions authorized in the 10x10 plan.

During the fall semester 2006, the Department handled the obligatory Baldridge-Reuben continuous assessment exercise with panache! The results are available in departmental files for anyone to view. In addition, the Department completed its Org Chart as directed and finally took its rightful place in the grand scheme of life at the "New" University of Toledo. In the spring semester 2007, the new president promulgated a draft "Directions" document, which was later revised and vetted by a "vision team." During the summer, several "implementation committees" worked on proposals to establish several new initiatives.

By November, 2007, we have updated our four proposals for new ERIP faculty lines and have shown that they aligned with the administration's Directions document, and with the College's updated Strategic Plan just being completed. Meanwhile, the new Provost announced competition for the next three years of the 10x10 cluster hiring. Department faculty were very active in seeking collaborative thrust areas with other departments and were instrumental in writing proposals for 13(!) new faculty lines, many planned as joint appointments with other departments. These other departments included Environmental Sciences, Chemistry, Mathematics, and Electrical Engineering and Computer Science. Both the ERIP and 10x10 proposals are now being evaluated by the Provost.

In response to the growth in faculty numbers, more postdocs, and steadily increasing graduate enrollments, Willie has had to scramble to find office space for everybody. We have been able to do some space renovation in Ritter as we plan for J.D. Smith's arrival. RO300 and 400 have been transformed. One of the large office rooms for graduate students (MH2014) has been upgraded with new carrels purchased by the P&A Fund for Excellence. Some space relief will also come soon from moving the silane-based research of Prof. Deng into a new lab in the R1 Building, and also providing an additional lab for Prof. Collins in the Research and Technology Building #1 (R1). This major R1 "upfit" is financed partly by the Wright Center for PVIC ($0.5M) and partly by the UT match to PVIC ($1.5M).

Overall, our department remains tightly constrained with inadequate instructional and research space. Relieving this situation and trying to obtain flexibility for future initiatives, such as to accommodate innovative new teaching styles for introductory courses, is one of my highest priorities. I am working to put this situation on the agenda of the new President, new Provost and new Dean. Such are the joys and challenges of helping to guide an exceedingly successful Department. These continue to be exciting times in the UT Physics and Astronomy Department!

Come visit us or send us e-mail about your news. We'd love to hear from you!

Al Compaan (alvin.compaan@utoledo.edu)
November 19, 2007

NOTABLE FACULTY NEWS

Many of our faculty are actively involved in research grants and publications. Some specific examples provided to Waves include:

JACQUES AMAR

Received an MRAC Teragrid award (250,000 SUs) from the National Center for Supercomputer Applications (June 2007)

Participated in the Materials Research Society Congressional Visit Day in Washington, D.C., as part of an effort to lobby Congress to support science research (May 2007)

Nominated for an Ohio 2007 Advanced Technology Summit Innovator Award (February 2007).

Received a major grant (30,000 RUs) from the Ohio Supercomputer Center (January 2007)

An article on "Effects of Oblique Incidence in Metal (100) Epitaxial Growth", by Y. Shim and J.G. Amar was published in Physical Review Letters (January 2007).

Co-pI on the recently awarded Ohio 3rd Frontier grant, "Wright Center for Photovoltaics Innovation and Commercialization", (December 2006).

Invited to talk on "Simulating Non-Equilibrium Processes over Extended Length- and Time-Scales using Parallel Accelerated Dynamics and Parallel Self-learning Kinetic Monte Carlo", at the American Chemical Society meeting in San Francisco (Sept 2006).

BERNARD BOPP

Professor of astronomy, is a voice student of Professor Erik Johanson in UT's Department of Music, and has sung with choral groups such as the UT Community Chorus, the Toledo Symphony Chorale, the Toledo Choral Society, and Masterworks Chorale. He has been a featured tenor soloist in choral works such as Schubert's Mass in G, Mozart's Missa Brevis in C, Missa Brevis in F, and Credo Mass, Haydn's Lord Nelson Mass, Vivaldi's Magnificat, Pinkham's Wedding Cantata, D. Scarlatti's Magnificat, and Gounod's 'St. Cecilia' Mass.

XUNMING DENG

Founded Xunlight Corporation, formerly MWOE Inc. It was one of two local firms awarded grants from the National Institute of Standards and Technology ATP Program. The company hopes to drive down the per-watt price of solar generation. Professor Deng says it is a low-cost method of making super-thin solar material at its Nebraska Avenue facility.

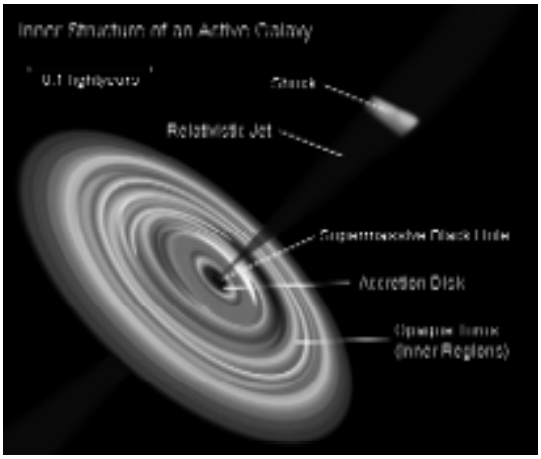
SANJAY V. KHARE

Grants funded:
Awarded June 2007: $174,356, "Collaborative Research: Using Nanoscale Patterning to Reveal the Atomic-scale Effects which Drive Unstable Growth of GaAs(001)," as principal investigator, by the National Science Foundation, to be spent over three years.

Awarded April 2007: $43,400, "Ab initio modeling of slippery hexagonal solids," as sole principal investigator, by the Air Force, for one year.

Awarded February 2007: $930,000, "Novel Portable Nanosensors for Biological Applications," as a co-PI, by DARPA, a Department of Defense agency. His share is $34,560 for one year. This was a proposal by Khare (the sole theorist) and a team of experimentalists at U. of Toledo and BGSU.

Approved for funding December 2006: $18,635,238, "Wright Center of Innovation in Photovoltaics", from the State of Ohio, for large team of industrial and academic scientists, his share is about $130,000.



Relativistic Jet. The environment around the AGN where the relativistic plasma is collimated into jets which escape along the pole of the supermassive black hole.

REVA KAY WILLIAMS

Continuing research on relativistic jets may provide evidence for the reality of Einstein's predicted frame-dragging. Gravitomagnetic forces produced by the Lense-Thirring effect (frame-dragging) within the ergosphere of rotating black holes combined with the energy extraction mechanism by Sir Roger Penrose have been used to explain the observed properties of relativistic jets. Dr. Williams in her rigorous proof validating the Penrose mechanism developed a gravitomagnetic model that predicts the observed high energy particles (~GeV) emitted by quasars and other active galactic nuclei (AGN); the extraction of X-ray and gamma-ray photons; the collimated jets about the polar axis; and the asymmetrical formation of jets (relative to the orbital plane). For more information, http://en.wikipedia.org/wiki/Frame-dragging and http://en.wikipedia.org/wiki/Gravitomagnetism

WELCOME OUR NEWEST FACULTY MEMBERS!

Our newest faculty members are both astronomers: Dr. Rupali Chandar, who joined the department in August 2007, and Dr. JD Smith, who will be joining us in January 2008. They were both hired as part of the Provost's initiative to expand areas of excellence within the university (it's worth pointing out that two of these selected areas, astrophysics and alternative energy, are housed within our department).

Rupali Chandar comes to us via the Carnegie Institute, the Johns-Hopkins University, and the Space Telescope Science Institute. Her specialization is in the study of clusters of stars in external galaxies, using them as indicators of the evolution of galaxies through time. Much of her research is done using the Hubble Space Telescope.

JD Smith joins us from the Steward Observatory at the University of Arizona, where he has been a member of the instrument team on the Infrared Spectrograph (IRS) on the Spitzer Space Telescope. JD's research specialties focus on infrared studies of both young stars and massive stars, and he has significant expertise in the calibration and analysis of infrared spectroscopy.

We look forward to the expanded expertise and bright future that these excellent scientists bring to our department, and particularly to our astronomy and astrophysics program!

RITTER PLANETARIUM AND BROOKS OBSERVATORY

Nancy Morrison has just completed her first year as director of Ritter Planetarium and Brooks Observatory, with Alex Mak continuing as Associate Director. New this year was the establishment by the College of Arts and Sciences of a half-time graduate assistantship dedicated to the planetarium. This year, the position was held by Brad Rush. He did a great job presenting planetarium shows.

Undergraduate assistants for 2006-07 were Angela Jones, Samantha MacAfee, Paul Sell, Lauren Smith, Emily Sopkovich, and Stephanie Torok.

Attendance this year continued at the level of recent years at about 28,500, including UT students, scout groups, visiting students from area schools, and the public.

With funding provided by the College of Arts and Sciences, the planetarium will be a sponsor for the coming year of the short radio program StarDate, which airs on WGTE-FM each weekday evening at 6:30. Each Tuesday and Thursday, the program will be preceded by our 15-second announcement, which may vary according to upcoming events. It will be on the air soon; listen for it!

Most significantly, this year the planetarium received a posthumous gift from Mr. Robert Ossege amounting to about $21,000. Mr. Ossege was a generous donor to many of the area's educational and charitable institutions, including UT. The donation has been split into two funds, one to support future production of planetarium shows and the other education and outreach to schools.

With the latter funds, we have purchased a large flat-panel TV in order to set up a video display in the planetarium lobby, next to the scales. It displays NASA's ViewSpace, a self-updating kiosk display featuring Hubble Space Telescope scientific results and other NASA material. Mak and Morrison saw examples of ViewSpace material at the annual meeting of the Astronomical Society of the Pacific last September and were deeply impressed. Initial installation of the display has been completed. Stop by the planetarium lobby and see it for yourself!

A new "UT Astronomers" Lecture has been inaugurated at the planetarium. The purpose of this series is to provide an overview of the exciting astrophysics research programs underway in our department. Look for these public lectures usually on the second Wednesday of each month at 7:30 p.m. at the planetarium.

UT Society of Physics Students Named 2005 - 2006 Outstanding Chapter
(Excerpts and picture of this article is reprinted from UT news)

The University of Toledo chapter of the Society of Physics Students (SPS) has been selected as an Outstanding SPS Chapter for the academic year 2005-2006. This honor is bestowed on fewer than 10% of the SPS chapters each year. This is the fifth time that our chapter received this honor in the recent past. The selection is based on the depth and breath of our activities in the areas of public science outreach, physics and astronomy research, representation at local, national and international meetings and the social interactions of our chapter.

SPS Officers
President: Paul Sell
Vice Pres.: Stephanie Torok
Sec./Treas.: Adam Gray
Outreach: Matt Weller
The society has received a total of five of the Outstanding Chapter awards since 2001.

The Society of Physics Students is a professional association. Membership is through collegiate chapters and is open to anyone interested in physics or astronomy. Within SPS is Sigma Pi Sigma, the national physics honor society, which elects members on the basis of outstanding academic achievement. The two-in-one society operates within the American Institute of Physics, an umbrella organization for 10 other professional science societies.

SPS was formed in 1968 and has more than 700 chapters on campuses across the country. About 5,000 students take part in chapter activities each year, making SPS the fourth largest physics society in the United States. The associated honor society, Sigma Pi Sigma, exists in about 450 of those chapters with more than 75,000 inductees throughout its history.

According to Gary White, director of the Society for Physics Students, the selection was based on the depth and breadth of SPS activities conducted by the chapter in such areas as physics research, public science outreach, physics tutoring programs, hosting and representation at physics meetings, and providing social interaction for chapter members. To apply for the award, the UT chapter submitted an annual chapter report that provided an overview of its activities to the Society for Physics Students national office in Maryland.

According to Dr. Scott Lee, UT professor of physics and faculty adviser for the UT chapter of SPS, the UT chapter of Society for Physics Students has around 20 active members and holds meetings every two weeks to announce and discuss chapter activities, hold demonstrations for members in preparation for outreach events, and hold a speaker series in which the chapter invites departmental professors to give presentations on a variety of topics from their research.

The Outstanding Chapter awards were selected by the zone councilor of SPS. In recognition of their award, the UT chapter was given a certificate to display in the Department of Astronomy and Physics.

“The UT Department of Physics and Astronomy is a very strong supporter of the Society for Physics Students,” said Lee. “They have provided the organization and the students with a lounge in which to meet and conduct their work. The department is very happy for the recognition.”

PROFESSOR BOPP WINNER OF STUDENTS FIRST AWARD

Dr. Bernie Bopp, professor of physics and astronomy and director of the Center for Teaching and Learning was named a recipient of the Students First Award in April 2007.

Student learning is the top priority for Bopp and although he is a busy administrator, Bopp still teaches courses in the physics of music and sound, personalizing them by learning every student’s name, no matter how large the class.

“Dr. Bopp treats all students and colleagues with the utmost respect,” said nominator Christine Keller, secretary of the Center for Teaching and Learning. “He takes time to sit down with a student to go over concerns, and goes above and beyond. He always puts the students first.”

Bopp graciously accepted the award, saying he only wished he could do more. “It is a great honor to be recognized this way,” Bopp said. “The award itself speaks directly to what should be our overriding concern at UT: the well-being and success of our students.”

UNDERGRADUATE AND GRADUATE NEWS

- Professor Adolf Witt reported that two undergraduates who worked with him on their undergraduate research projects during the past two years and who recently completed their respective honors theses under his direction are both heading for excellent graduate schools for their PhDs in astrophysics:

  Paul Sell accepted an offer from the University of Wisconsin. He received a number of offers from universities around the country. He started there this fall.

Thomas Dixon, who spent a year at UT as an exchange student from the University of Hertfordshire in 2005/2006 and who worked with Dr. Witt since January 2006, continued to work with him under an arrangement with his home institution during the past year. Tom also received a number of attractive offers, including from Oxford and Cambridge in the UK, but he decided to accept an offer from the University of Hawaii. The attraction of a tropical paradise was clearly stronger.

- Dr. Witt's former graduate student, Karl Gordon, who graduated with his PhD from UT in 1997, has accepted an offer of a tenure-track astronomer position at the Space Telescope Science Institute in Baltimore, MD. Karl will be working on the James Web Space Telescope, which is currently being built as the successor to the Hubble Space Telescope. Launch is planned for 2013.

- Ohio EPA and Academy of Science Award Environmental Scholarships Students at four-year institutions receiving a $2,500 scholarship for the 2007-2008 school year include: Ryan Zeller, University of Toledo (Applied Physics), from Strongsville, Ohio

- Professor Victor Karpov reports that Mukut Mitra's internship at Intel has been extended through the fall semester 2007.

MATERIALS RESEARCH SOCIETY

The University of Toledo / Bowling Green State University joint chapter of the Materials Research Society (MRS), in conjunction with Dr. Sylvain Marsillac's "Fundamentals of Solar Cells" class, held a symposium on Saturday, April 7, 2007 entitled "Materials Research in Thin Films and Photovoltaics." The event was kicked off with a greeting from Dr. Frank Calzonetti, Vice President for Research and Development at the University of Toledo, followed by a presentation on solar energy given by Dr. Al Compaan, Chair and Professor of Physics. Twenty-one graduate students from the Physics, Chemistry, and Engineering Departments of the University of Toledo and Bowling Green State University participated in the symposium by presenting a poster and giving a fifteen-minute oral presentation. Prizes were awarded to the students with the best overall posters. Jie Chen received a green (532 nm) laser pointer for his first place poster and Anuja Parikh received a complimentary one-year MRS student membership for her second place poster.

Along with the posters and oral presentations, fun and interesting demonstrations in electromagnetism, superconductivity, solar energy, and liquid nitrogen ice cream were performed. Lunch was also provided to everyone by Phoenicia Restaurant.

An estimated sixty people attended the symposium, including college professors, graduate students, undergraduate students, high school students, middle school teachers, and families with young children. One astronomy graduate student, who brought his young son to the symposium, wrote, "I just wanted to let you know that my son and I really enjoyed the conference. He really had fun with the demonstrations, especially the ice cream. … Pass along my thanks to everyone that had a hand in organizing it. Thanks."

Many thanks go to all who participated to make this event possible, especially Dr. Sylvain Marsillac, Victor Plotnikov (President of MRS), Jason Stoke (VP of MRS), Jonathan Skuza (Treasurer of MRS), Dr. Terry Bigioni (Poster judge), and Dr. Sanjay Khare (Session chair). Financial support was provided through an MRS Special Project Grant ($870) and Dr. Sylvain Marsillac ($550).

PROFESSOR ROB COLLINS HEADS UP INTERNATIONAL CONFERENCE

The 22nd International Conference on Amorphous and Nanocrystalline Semiconductors was held August 2007 in Breckenridge, Colorado. Professor and NEG Chair, Rob Collins was the Conference Chair.

The University of Toledo PVIC along with the National Renewable Energy Laboratory were the primary conference sponsors and held the top spot on all the banners and promotional material at the conference. Howard Branz, the leader of the Thin Film Silicon Group at NREL, and Professor Robert Collins were the co-organizers.

Prof. Collins supervised fundraising, scientific program, and proceedings with the help of several members of the organizing committee and Dr. Branz handled the local arrangements similarly. University of Toledo students and post-docs gave seven presentations in all which were very well received on the quality of their scientific work.

At the conference, Prof. Collins presented the Mott Lectureship Award to Professor Walther Fuhs retiree from the Hahn-Meitner-Institut, Berlin.

CONGRATULATIONS

Sue Hickey, Department Secretary, new grandson, Matteo Francisco Sifuentes, born June 24th

James Walker, Post Doctoral Research Associate, new son, Jameson Ernesto Hermandez Walker, born August 21st

Megan Reichert, R-1 Clean Energy Director, new daughter, Rachael Elizabeth, born September 18th

JD Smith, Assistant Professor of Astronomy, new son, Quinton John Smith, born October 22nd

RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU)

Left to Right (Front row): Randy Patton, Mary Mills, Nicholas Reshetnikov, Tim Lou, Ryan Zeller, Lawrence Anderson-Huang, Alvin Compaan, Lindsey Weber, Lindsay Sanzenbacher, Shawn Witham, William Dirienzo, Jennifer Schanke, Sylvain Marsillac

Left to Right (Back rows): Kyle Bednar, Adam Gray, Craig McClellan, Ryan Hupe, Rick Irving, Thomas Kvale

The Summer 2007 NSF-REU program in Physics and Astronomy at Toledo gave enhanced research opportunities to 15 undergraduate students from 8 colleges and universities in 11 states spread from coast to coast. Thanks to the hard work of Dr. Ellis, Dr. Kvale, and Dr. Witt this great REU class for 2007 was chosen from the 147 applications that originated from 34 different states and 3 foreign countries (France, Iran, USSR).

It is good to report this Summer was a success from both the students' and faculty mentors' perspectives. Several talks and posters were presented at regional and national conferences by the REU participants. At least one refereed manuscript has been submitted based on the research this past summer. It is anticipated that more manuscripts are in preparation and will be submitted shortly. Social activities were coordinated by three UT participants (Adam Gray, Lindsay Sanzenbacher and Ryan Zeller). This worked out very well and the students formed a close-knit group. Weekly activities included Monday movie/game night at McMaster Hall, Wednesday nights at a local, family restaurant (Uncle John's Pancake House), and Ultimate Frisbee games. Some of the special events included departmental picnics, trips to Cedar Point Amusement Park, the Toledo Museum of Art, and the Toledo Zoo, plus many informal activities, including an evening at Tony Packo's, Toledo's famous ethnic restaurant and traditional jazz club. The perennial favorite is a windsurfing adventure, courtesy of Professor Alvin D. Compaan at his solar hybrid home.

A weekly "Brown Bag" seminar series is an important part of our summer program. Faculty members and/or outside speakers are asked to present a talk over the lunch hour for the chosen day. This format fosters more of an informal atmosphere, which the students appreciate when it is their turn to give a presentation at the close of the summer session. This weekly meeting of the entire REU group also provides an opportunity to plan social events and field trips, and discuss any topics of interest to the group. During one such discussion the REUs designed a T-shirt to remember their stay at our department. You can view the shirt they made at the department REU web site:
http://astro1.panet.utoledo.edu/~webforce/LinkI1.htm

The whole department is invited to attend the Bag Lunches, and the participation has been very good with many graduate students and faculty members also attending. This provides a useful departmental weekly gathering, otherwise absent in the summer. The talks at these weekly meetings are similar to standard physics research talks, but chosen to be appropriate for this REU audience, and with all the speakers being careful to give undergraduate-level introductions. We require the students to give a 5 minute presentation of their research about midway into their summer period. The midway progress talks went well and kept the students focused on their projects.

As part of the REU program, the REU students in part host the Physics Summer Camp. This is an outreach activity for high school students interested in science. The idea is to minimize the age-gap between organizers and participants in order to foster discussions about science in general and physics in particular. The REU team was very enthusiastic about this concept which helped make the Camp a success. Additionally, many thanks goes to a science teacher from St. Ursula, Jackie Kane, for her help in developing activities and recruiting students for the Physics Summer Camp. We had a whopping 23 high school students attend. St Ursula, Northwood, Sylvania Southview, and State Line Christian high schools were represented.

The theme this year for the camp dealt with exploring alternative forms of energy that are utilized in our local area. The camp took place Wednesday, July 18th and Thursday, July 19th from 9:00 am- 2:30 pm. During the Camp we took road trips using a UT bus to:

- Green by Design – a company that installs residential size wind turbines
- BGSU's Electric Vehicle Institute to see the battery powered race car, the Electric Falcon
- Don Scherer's house to see his personal wind turbine.
- The 1.8 MegaWatt (MW) utility-scale wind turbines in Bowling Green
- Al Compaan's solar hybrid house and battery powered truck

Mixed in with the road trips we had fun playing in the lab. One day we had competitions to see who could make the best blade for their wind mill. The idea was to see how much load their design could lift with a standard fan (wind power) and mount for their blades. Another lab adventure had people investigating solar cells. Then the students used the solar cells to power their hand made race cars. Please visit: **http://www.physics.utoledo.edu/~rirving/Summer_Camp_2007.htm** for the Camp event details.

Finally a big thanks goes out to the office staff, Willie Brown, Sue Hickey, and Stephany Mikols. The REU program and the Physics Camp would not have run smooth without their help. Again please visit the following url for details of the past summer REU program: **http://astro1.panet.utoledo.edu/~webforce/LinkI1.htm.**

SEVENTH ANNUAL RECOGNITION CEREMONY

Dr. Song Cheng, chair of the undergraduate committee consisting of Professors Karen Bjorkman, Scott Lee, Bo Gao and Sanjay Khare presented on April 23, 2007, the Department of Physics and Astronomy's Seventh Annual Recognition Ceremony and Sigma Pi Sigma induction.

The following received awards were presented:

Elgin Brooks Memorial Astronomy Scholarship
2007 Awardee: **Adam Gray**

A. Jackson and Sally K. Smith Scholarship
2007 Awardee: **Lindsay Sanzenbacher**

Robert and Noreen Stollberg Undergraduate Academic Achievement
2007 Awardee: **Ryan Zeller**

Robert and Noreen Stollberg Graduate Teaching Achievement
2007 Awardee: **Erin Allgaier**

Chad Tabory Memorial Outstanding Undergraduate Research in Physics and Astronomy
2007 Awardee: **Daniel Moomey**

C.V. Wolfe Scholarship in the Natural Sciences
2007 Awardee: **Alex Penn**

Elmer and Gertrude Brigham Scholarship in Science
2007 Awardee: **Kyle Bednar**

Physics & Astronomy Outstanding Graduating Undergraduate Student
2007 Awardee: **Paul Sell**

The 2007 Sigma Pi Sigma Inductees were: James Davidson, Maeghan Gault, Adam Gray, Sean McKenzie, S. Thomas Megeath, Charles Poteet, Blagoy Rangelov, Sara Rother, Lindsay Sanzenbacher, Mark Simon, Matt Weller, Ryan Zeller. Dr. Scott A. Lee is the faculty advisor.

THE UT ENDOWMENT FUND CAMPAIGN

Alumni and friends of the Department of Physics and Astronomy are urged to remember our department and college as they consider giving and pledging. The department has several established funds, some of which are endowed and others may not yet be endowed.

John J. Turin Memorial Fund
Established to honor former department chair and dean of the Graduate School, John J. Turin. He was integral in building UT's first Ph.D. program in the 1960's. This endowment funds the annual Turin lecture by a distinguished graduate of our department.

Chad Tabory Outstanding Undergraduate Research Fund
This account, founded in memory of Chad Tabory, a UT physics graduate and research lab technician, funds the outstanding undergraduate research award.

Ritter Observatory Publication Fund
This fund helps to support the cost of publishing the Ritter Observatory annual report, as well as student papers when possible.

Reach for the Stars Fund
This account has recently been established to begin an endowment that will be used to support the buy-in to an international telescope consortium and ancillary activities. This is a major goal of the Department.

The Planetarium Progress Fund
The purpose of the Planetarium Progress Fund is to hold the subscription donations of the Friends of Ritter Planetarium and all other gifts in support of our astronomy outreach programming. All funds are used for large capital expenses and the growth of an endowment portfolio, the interest from which will help cover operating expenses.

Physics and Astronomy Fund for Excellence
The Fund for Excellence supports scholarships and fellowships, acquisition of research equipment, special colloquia, etc. which are so essential for departmental excellence.

Sigma Xi Dion D Raftopoulos Outstanding Faculty Research Award
This is a perpetual memorial in honor of Dion D. Raftopoulos for support of the Sigma Xi Award for Outstanding Research at UT. This award remains one of few awarded by the faculty to peers in recognition of their outstanding contributions to the research enterprise at the UT. We are proud to note that 12 of the total 30 winners of this award through 2005 have been from the Department of Physics & Astronomy.

The **UT ALUMNI ASSOCIATION** wants to hear from you. Check out their web site at **www.toledoalumni.org**. Please join the movement!

DEPARTMENT CHAIR APPOINTED TO PUBLIC BENEFITS ADVISORY BOARD

Our Department Chair, Al Compaan, was appointed by Governor Ted Strickland to the Public Benefits Advisory Board (Toledo Blade Aug 18, 2007) to a two-year term beginning July 27, 2007. This Board advises the Ohio Department of Development on policies such as the Home Energy Assistance Program (HEAP) and the Percentage of Income Payment Plan (PIPP) that assist families with electric and natural gas utility payments. Some of the funding for these programs comes from the Universal Service Fund (USF) through a small surcharge on utility payments. The Board also advises the ODOD on the Energy Loan Fund (ELF) that supports loans for energy efficiency and renewable energy building projects, and the Advanced Energy Fund (AEF) that awards grants for distributed generation, renewable energy and energy efficiency projects. The ELF and AEF are funded by a rider on the electric rates of customers of the investor-owned utilities in Ohio such as First Energy, AEP, and Duke Energy.

TOLEDO PV RESEARCH FEATURED IN NEWSWEEK!

On page 56 of the October 8, 2007, issue of Newsweek our PV program is complimented: "…Historically, Toledo's big employers have been auto factories or auto suppliers—particularly glass manufacturers that make car windshields. But lately Toledo has established a growing national reputation as a hot spot for firms developing solar panels. Why Toledo: Glass is a key component in solar technology, and the University of Toledo has been doing hard-core solar-cell research for two decades…." The story, available on-line at: http://www.msnbc.msn.com/id/21047656/site/newsweek/from/RSS/ includes discussion of First Solar, which began on the UT campus and is now the U.S.'s largest manufacturer of PV panels, and also discussion of Prof. Xunming Deng's new PV start-up company, Xunlight. The article includes a great photo of three Physics and Astronomy graduate students, Jason Stoke, Jian Li, and Victor Plotnikov, in MH1017. Autographs are becoming difficult to get from these guys; get your order in early! The Toledo Blade also recently featured a story on PV in Toledo. Go to www.toledoblade.com and search on "Calyxo".

ALUM, BOB DEMPSEY, NASA FLIGHT DIRECTOR GIVES TURIN MEMORIAL LECTURE

Picture credit: Dan Miller UT photographer

On October 18, 2007, Dr. Robert Dempsey, flight director for the International Space Station at NASA Johnson Space Center, presented the John J. Turin Memorial Lecture.

His discussion entailed "A Rocket in Low Earth Orbit: Engineering Challenges in Operating the International Space Station" which focused on some of the issues that go into the planning and operations of a permanently manned vehicle as viewed from the flight control team in mission control.

Dempsey received his Master of Science and Doctor of Philosophy degrees in physics from UT in 1987 and 1991, respectively.

He was also awarded the prestigious 2007 Turin Award in which the lecture is named after Turin. The late Dr. Turin, was chair of the UT Department of Physics and Astronomy from 1942 to 1972 and dean of the Graduate School from 1969 to 1973.

RADIATION ONCOLOGY FELLOWSHIP HIGHLIGHTS DISTINCTIVE PROGRAM AT UT MEDICAL CENTER

Dr. E. Ishmael Parsai in front of the medical linear accelerator, a device that uses radiation to treat cancer patients. For those growing up during the Cold War, radiation may not bring positive images to mind. But at The University of Toledo Medical Center, radiation can be a life-giving force, a disinfectant purging tumors and cancers from the body and giving hope to many dealing with dangerous afflictions.

Dr. Parsai, professor and director of the Medical Physics Program in the Department of Radiation Oncology, who has doctoral degrees in nuclear and medical physics, ultimately is responsible for maximizing damage to diseased tissue while sparing that which is healthy.

According to Parsai, UTMC is distinct in that few hospitals, regardless of size or prominence, offer the range of treatment modalities through its own medical physicist services. Those that do, however, are familiar with Parsai, as he is the chairman of the American College of Radiation Oncology (ARCO) Physics Commission, the accrediting agency that establishes and judges standards for hospitals' medical physics operations.

A few years prior to the UT-MUO merger, Parsai helped start a joint Ph.D. program in medical physics with the UT Department of Physics and Astronomy. He calls it a very popular degree program and estimates that nearly 40 medical physicists have graduated in the past 14 years; these professionals are now in prominent positions at some of the most prestigious institutions in the United States, Harvard, Fox Chase Cancer Center, M.D. Anderson, Stanford and many other academic sites around the country.

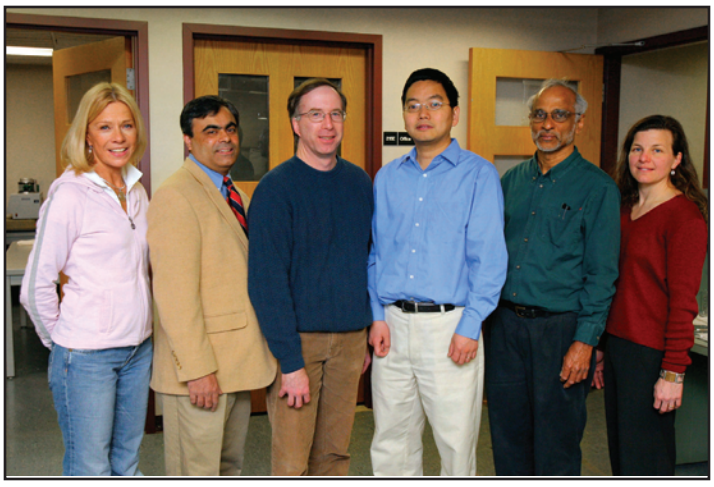
UT SCIENTISTS STUDY NEW TECHNOLOGIES TO UNCOVER BIOLOGICAL, CHEMICAL, HAZARDOUS MATERIALS

(EXCERPTS FROM UT NEWS)

Eight UT researchers, including, from left, Dr. Alejandra Lukaszew, Dr. Ahalapitiya Jayatissa, Dr. John Kirchhoff, Dr. Xuefei Huang, Dr. Viranga Tillekeratne, Dr. Cyndee Gruden, are working together to develop sensors to detect hazardous materials in water and air.

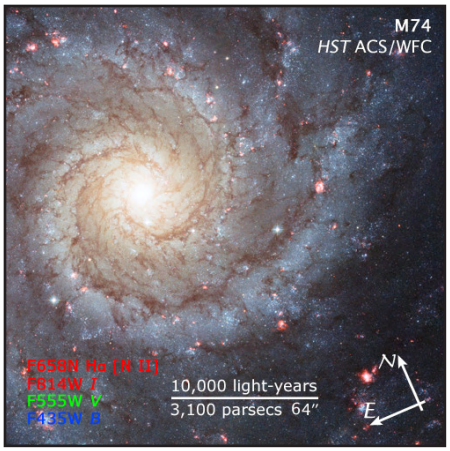
These eight scientists are combining their individual talents and skills to develop intricate sensors capable of sounding an early alarm about the presence of deadly biological and chemical agents in water and air.

Dr. Jon Kirchhoff, professor and associate chair of chemistry and principal investigator, leads the effort to harness UT research expertise across a range of disciplines — from chemistry and physics to civil and mechanical engineering — and apply that expertise to the development of tools and techniques to protect people's health and the environment. Funding for the $970,000 project titled "Novel Sensors for Chemical and Bio-Defense" came from the Defense Advanced Research Projects Agency, a Department of Defense agency.



Co-principal investigators are Drs. Xuefei Huang, associate professor of chemistry; Ale Lukaszew, associate professor of physics and astronomy; Sanjay Khare, assistant professor of physics and astronomy; Richard Hudson, professor of medicinal and biological chemistry; Viranga Tillekeratne, associate professor of medicinal and biological chemistry; Cyndee Gruden, assistant professor of civil engineering; and Ahalapitiya Jayatissa, assistant professor of mechanical, industrial and manufacturing engineering. Dr. Bruno Ullrich, associate professor of physics and astronomy at Bowling Green State University, also is collaborating with the UT group.

HUBBLE SPACE TELESCOPE FEATURES HOLIDAY WISHES IMAGE



A "holiday" news release by the Hubble Heritage Team at the Space Telescope Science Institute, which features a Hubble Space Telescope optical image of the beautiful spiral galaxy M74. Portions of the data for this image were obtained by our own Professor Rupali Chandar, as part of her studies of star clusters in galaxies, and she is acknowledged in the credits for this image. If you'd like to learn more, the release is available on the web at: **http://hubblesite.org/newscenter/archive/releases/2007/41/**

EXTREMELY HOT PLANET, MAKES FIRST MAKES EXOPLANET WEATHER MAP

Astronomy Professor, Tom Megeath, helped take the temperature of a planet 60 light years away, revealing a world where weather is a mixture of hell and hurricane. He was part of a team using the space telescope named for Toledo-native and astrophysicist Lyman Spitzer to look at a planet in the constellation Vulpecula, or "little fox".

This is the first time they could actually start studying the atmosphere of an extra-solar planet in any detail. This gives an insight into planets that are very different from anything imagined before. It's a window on a very exotic system.

The full coverage is available in a news release on-line: **http://www.spitzer.caltech.edu/Media/releases/ssc2007-09/index.shtml**

BREAKING NEWS
OHIO GOVERNOR LAUDS UT RESEARCHERS FOR ENERGY WORK DURING VISIT

Dr. Xunming Deng, professor of physics, right, showed a solar panel fabricated by his team to Ohio Gov. Ted Strickland.
(Excerpts Courtesy of UT News by Jon Strunk)

Choosing UT and its research into photovoltaics and other alternative energies as the backdrop for his Nov. 28 visit, Ohio Gov. Ted Strickland joined Congresswoman Marcy Kaptur and other University, business and elected leaders for a tour of a number of alternative energy-related startup businesses located in UT's incubator building at the corner of Westwood Avenue and Dorr Street.

Ohio should make a commitment that by 2025, 25 percent of the state's electricity would be generated from renewable and advanced energy resources, like solar power, Strickland told a crowd of about 50 following the tour.

SAVE THE DATE

The University of Toledo

Ritter Astrophysical Research Center

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40th Anniversary Celebration

Tuesday, April 8, 2008

5:30pm

Dr. Nancy D. Morrison, Director

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