I would like to take this opportunity to talk about the progress we have made in the Department of Physics and Astronomy. We expect 10 undergraduates to graduate this year; this is the first time this has happened since 1992. We also expect to graduate 8 Masters’ students (the highest number since 1980) and 3 Ph.D.s this year—all very healthy numbers. And there are 17 students in our junior level Mathematical Methods of Theoretical Physics class (as usual taught so ably by Bob Henson), so the future enrollment trends are also going in the right direction.

Let me also mention some of our undergraduates’ accomplishments in our research laboratories. The following undergraduate physics majors made presentations at the 21st Annual Meeting of the NASA/Missouri Space Grant Consortium in April of this year. Ashlynn Conner, “Preparing Silicon on Insulator Specimens for Transmission Electron Microscopy Analysis” (advisors Phil Fraundorf and alum Dr. Jeff Libbert at MEMC Electronic Materials, Inc.); Krystal Kasal, “Star Formation in the Serpens Molecular Cloud” (advisor Bruce Wilking); Alyssa McFarland, “Investigation of Electrode Materials in Lithium-Ion Batteries: Improving Capacity and Cycling Performance” (advisor Eric Majzoub); Matthew Dennis, “Water and HDO in Comet 103P/Hartley 2” (advisor Erika Gibb); and Emily Sudholt, “Solar System Formation and the Rise of Life on Earth” (advisor, Erika Gibb).

With this increased number of students has come an increased need for scholarships for those students. Let me first thank all of you who made contributions to the Department. Your generous contributions have allowed us to increase the number of departmental scholarships from 3 in 2009 to 6 in 2012 and the amount from $1,500 per student to $2,000 per student. None of this would have been possible without a dramatic increase in giving. Again, thank you so very much.

Bernard Feldman

The Richard D. Schwartz estate has donated Dick’s Meade LX-200 16-inch telescope, SBIG CCD camera, and numerous accessories to the Department of Physics & Astronomy. This is a significant upgrade to our previous Celestron 14-inch telescope and gives us a second CCD camera to devote to our new spectrometer. Bruce Wilking and former faculty member Phil James traveled to Sequim, WA in late May and packed up the instruments for shipping back to St. Louis. The 13 boxes arrived in excellent shape and the telescope was installed at the Richard D. Schwartz Observatory in late June. Special thanks go to Eleanor McIntyre for her hospitality and facilitating the donation and to Steve Sands, a local amateur astronomer and member of the St. Louis Astronomical Society for a thorough appraisal.

Please come see the new telescope at one of our monthly Open Houses beginning in March (see p. 10 for schedule).

Dr. Erika Gibb and Matt Dennis
Nathan Dees Delivers Alumni Lecture

Dr. Nathan Dees, Senior Scientist at the Genome Institute of Washington University, was honored at the annual Alumni Awards Reception and Lecture on May 4. Nathan received his Ph.D. in 2009 working with Drs. Sonya Bahar and Frank Moss. Nathan’s lecture, “A Physicist’s Guide to Cancer Genomics” described the DNA sequencing process and shared results of his studies in mutations in cancer genomes. The talk was very well received and there were many questions during and after the talk.

Prior to the lecture, graduating senior Timothy Ferguson received the Jeffrey Earl Award for the Outstanding Physics Senior and a set of the Feynman Lectures. Tim was a double major in physics and math. Matthew Freeman received the Senior Alumni Award ($500). Pat Sheehan received the Outstanding Graduate Teaching Assistant Award which is a $250 prize and a one-year subscription to the American Journal of Physics.

Faculty/Staff Changes

We had two more faculty retirements/semi-retirements this year, both in August. Peter Handel, who joined the University in 1969 as an associate professor, was promoted to full professor in 1973. He retires as Professor Emeritus and plans to stay active in research. Jake Leventhal was hired at UMSL in 1968 as an assistant professor, tenured in 1971, and promoted to full professor in 1976. He was among the first group at UMSL to be named as Curators’ Professors in 1987. He will hold the position of Founders Curators’ Professor for 3 years.

Meet the Scholarship Recipients

We would like you to meet the scholarship recipients who you help support with your generous contributions. Matt Colonna, Henry Hamper, Ben Moore, and Stephen Ordway are receiving Physics & Astronomy Alumni Scholarships. Matthew Freeman is receiving the Richard D. Schwartz Scholarship. These scholarships provide the students with $2000 annually toward their educational expenses.

Matt Colonna - Matt went to high school at Trinity Catholic High School in Florissant, MO. He is a freshman and a member of the Pierre Laclede Honors College. He plans on majoring in Astrophysics, and hopes to research exoplanets or the moons of Jupiter and Saturn (specifically, Europa, Io, Enceladus and Titan). When he has time, his interests and hobbies outside of school include astrophotography, playing bass guitar and video games, drawing and reading.

Matthew Freeman – Matthew is a returning student with a previous B.A. of Music from Webster University. He came to UMSL to get a degree in physics as he enjoys science and wanted an education that would lead to greater financial stability. At this time he wishes to enter into an area of condensed matter physics of unspecified focus. He is currently a math tutor for UMSL, TA for the Physics 2111, and over the last summer and current semester has done research in astronomy and microscopy. Outside of school and work he plays video games and piano, when he has time.

Henry Hamper - Henry Hamper is currently a sophomore at UMSL. He is working on a general Physics degree with a minor in Chemistry, and plans to pursue a doctorate in Materials Science. Henry is currently the treasurer of UMSL’s Physics and Astronomy Club. He also works in the Chemistry Storeroom.

Stephen Ordway – Stephen went to high school at Jefferson City High School. He is a senior, finishing his bachelor's degree in Physics at UMSL. Last year he attended University of Birmingham, which has one of the highest ranked physics programs in England. He is also member of the Pierre Laclede Honors College. Currently, he is working with Phil Fraundorf in the Nano-Science Center at UMSL on a project analyzing Ultra-High Temperature Ceramics. Most of his interests outside of school include hanging out with friends and family and tinkering with electronics, specifically ones dealing with sound. His hope as of now is to attend graduate school and eventually achieve a Ph.D. to work on solid state or material science research.

Venus Transit Attracts Hundreds to Observatory

Over two hundred visitors flocked to the Richard D. Schwartz Observatory to view the transit of Venus on June 5, 2012. This is a relatively rare event that occurs in pairs separated by eight years. The previous transit was in 2004 and the next pair will not occur until 2117 and 2125. The Celestron C-14 and C-8 telescopes were set up with solar filters for safe viewing. Dr. Erika Gibb discussed the event on KWMU, NPR’s Morning Edition and was also interviewed by the St. Louis Post-Dispatch.

The planet Venus transiting the Sun with several sunspot groups also visible. The photo was taken with an iPhone through the Observatory’s Celestron-8 telescope.
Graduate Program Update

We awarded seven M.S. in Physics degrees and three Ph.D. degrees in 2012. Logan Brown, Micah Burgdorf, Dawn King, Brian Long, Nandita Nag, Alex Noah, and Dongxue Zhao completed Master’s degrees. Logan, Dawn, and Dongxue are continuing in our doctoral program. Logan passed the Ph.D. Qualifying Exam in January 2012 and six doctoral candidates will take the Qualifying Exam in January 2013. Glenn Carlson, Kaushalya Premachandra, and Kari Wojtkowski all successfully defended their doctoral dissertations. Glenn’s dissertation was entitled “Handel’s Maser-Soliton Theory of Ball Lightning: The Creation of Three-Dimensional Cavitons by an Atmospheric Maser with an Open Resonator”. His advisor was Peter Handel. Kaush’s dissertation with Sonya Bahar was entitled “Complex Scaling Behavior in Animal Foraging Patterns”. Erika Gibb was Kari’s advisor whose dissertation was on “The Characterization of Volatiles Associated with Young Stellar Objects”.

Kristen Erickson was supported by a graduate fellowship from the NASA/Missouri Space Grant Consortium. She presented her research on star formation in the Serpens molecular cloud at the American Astronomical Society meeting in January in Austin, Texas and at the state-wide annual meeting in April at the MS&T campus (advisor: Bruce Wilking). Kristen was awarded an UMSL Dissertation fellowship for 2013. Kristen along with graduate students Logan Brown, Dawn King, and Adam Scott presented research posters at UMSL’s Graduate Fair in April. Adam received a $200 prize from the Department for his poster “Clustering and Phase Transitions on a Neutral Landscape” (advisor: Sonya Bahar).

We welcomed four new full-time students to our graduate program this year: Christopher Carr (SIU-E), Tavish Hill (SIU-E), Waruni Jayawardana (U. Peradeniya, Sri Lanka), and Tim Sullivan (Truman State).

NASA/Missouri Space Grant Consortium 21st Annual Meeting

The 21st Annual Meeting of the NASA/Missouri Space Grant Consortium was held on the Missouri S&T campus April 20-21, 2012. Undergraduates Matt Dennis and Emily Sudholt discussed their comet research (advisor: Dr. Erika Gibb). Ashlynn Conner presented the results from her internship with MEMC Electronics on the analysis of defects in semiconductors (advisors: Drs. Phil Fraundorf and Jeff Libbert). Krystal Kasal and Kristen Erickson talked about star formation in the Serpens molecular cloud (advisor: Bruce Wilking). Emily Sudholt also described the UMSL Planetarium Program conducted for area 5th grade students and teachers.

UMSL to host Delegation from Xiangtan University

The Department of Physics & Astronomy will host a delegation of 7 faculty members and administrators from Xiangtan University, China in January 2013. The Department will explore setting up an academic exchange program of students and faculty, and joint research programs. Xiangtan University, located in Hunan Province, was established in 1958 and has about 30,000 students. They offer 72 bachelor’s degree programs, 115 Master’s programs and 17 doctoral degree programs. Condensed matter physics is one of the nine main discipline areas of the University.

The New Science and Technology Academic Center

The College of Arts and Sciences has transformed Stadler 125 into a new tutoring lab for biology, chemistry, physics, and psychology. The room is staffed Monday-Friday by graduate students in these disciplines. The room has tables for group discussions, wireless access, white boards, and computer stations. Physics graduate students now hold their office hours in Stadler 125 instead of the Physics Learning Center on the 5th floor of Benton Hall.
Rock and Mineral Donation by the Harris Family

Through a generous donation by Mary and Hal Harris, we have acquired a spectacular rock and mineral collection belonging to Marlin Cline, Mary's father. There are new display cases on the 4th floor of Benton Hall showing a portion of the collection. Hal is a professor in the Department of Chemistry and Biochemistry at UMSL.

More Undergraduate Research

Ashlynn Conner, Krystal Kasal, and Alyssa McFarlane made poster presentations at the annual Undergraduate Research Symposium held on the UMSL campus on April 27 and hosted by the Golden Key International Honour Society and Sigma Xi. Alyssa’s poster presented her research on lithium-ion batteries (advisor: Eric Majzoub). Krystal Kasal received the Department prize ($250) for the best physics or astronomy poster.

Neurodynamicists Collaborate on "The Computational Theory of Cognition"

This year, Center for Neurodynamics members Sonya Bahar (Dept. of Physics and Astronomy) and Gualtiero Piccinini (Dept. of Philosophy) published an article in the journal Cognitive Science on "Neural Computational and the Computational Theory of Cognition". They took a combined neuroscientific and philosophical approach to address the question of whether neural computation is analog or digital... or something else entirely. They argued that neural computation is far more complicated than simple "computer-like" analog or digital computation. This work was featured online on UMSL’s website at http://blogs.umsl.edu/news/2012/11/19/interdisciplinary/gp_sb_495_330/.

In other Center for Neurodynamics news, the CND followed up last year's major expansion by adding a group of Neurodynamics Graduate Students, bringing together grad students in physics, philosophy, chemistry & biochemistry, psychology and biology who have an interest in neuroscience. Future plans include meetings with faculty to discuss grant-writing and the academic job market, as well as a graduate student mini-conference where students can present their work to each other and to faculty with related interests. For more updates on CND activities, contact Sonya Bahar at bahars@umsl.edu.

Physics & Astronomy Department’s Display in Lucas Hall

In November 2011, the Department was invited to set-up a display in the Arts & Sciences Dean’s office. Books authored by faculty members, awards, research papers, and student research posters were featured. Among the more unique items were some Missouri dinosaur fossils provided by Mike Fix.
Peabody Energy Gift to Renovate Mechanics Lab

A new lab for introductory mechanics will be constructed using a portion of a $750,000 gift from Peabody Energy. The space is on the 3rd floor of Benton Hall and was formerly one of Frank Moss’ research labs. As before, the room will be set up for 20 students, but with round tables for better student interaction, computers for data collection and analysis, and a computer projection system for the instructor. The lab will be used year around for introductory courses for life science majors (P1011) and for chemistry, engineering, math, and physics majors (P2111).

Cornel Eftimiu (1933-2012)

We were saddened to hear of the passing of Cornel Eftimiu. Here is an excerpt from the UMSL’s press release: “Cornel Eftimiu came to the University of Missouri–St. Louis in 1967, one of a small group of “stars” – faculty with outstanding credentials hired to prepare the young university for graduate education. Eftimiu died Oct. 25 in Bellingham, Wash. after a long illness. He was 79 years old. A gifted physicist, Eftimiu served as chair of the department during the 1970s and left UMSL in 1982. He worked for McDonnell Douglas Research Laboratories and Boeing during the 1980s and 1990s, and retired in Bellingham, WA. Eftimiu was born in Oradea, Romania in 1933 and earned his bachelor’s and doctoral degrees in physics from the University of Bucharest, Romania. He is survived by his wife Elena, two daughters, grandchildren and great grandchildren.”

FACULTY UPDATES:

Sonya Bahar

The current focus of my research group is on computational models of evolutionary dynamics. My graduate students and I are investigating the role of mutation size in controlling the process of speciation and are developing algorithms to characterize the amount of branching of evolutionary trees under various conditions. We are also studying various types of phase transitions in these evolutionary models. These computational projects are funded by a Complex Systems grant from the James S. McDonnell Foundation. In addition to the evolutionary projects, I am continuing my research in Neurodynamics, beginning a new project to look at synchronized neural “chimera” states which may be analogous to the “uni-hemispherical” sleep observed in some animal species. I have also been involved in a collaboration with Gualtiero Piccinini of UMSL’s Department of Philosophy, investigating the various types of computation that can be performed by neural systems.

bahars@umsl.edu
http://www.umsl.edu/~neurodyn/faculty/bahar.html

Dr. Bahar with doctoral students Dawn King and Adam Scott who were featured in the Fall 2012 edition of UMSL Magazine (Photo by August Jennewein).

Bernard J. Feldman

This is year I have published three papers in the U.S.-China Education Review, “The Elementary Physics in Four Bridge Failures,” “Teaching Scientific Ethics Using the Example of Hendrik Schön,” and “The Character of Science,” at B 5, 669 (2011), A 4, 418 (2012), and A 9, 1548 (2012). I have also a book review of “Neutrino,” by Frank Close in press; let me add that this book is a wonderful read and I recommend it to all of you.

http://www.umsl.edu/~phybfeld/
feldmanb@msx.umsl.edu

Michael Fix

I presented a talk In October 2012 at the annual meeting of the Society of Vertebrate Paleontology, which was held in Raleigh, North Carolina. It was part of a special symposium titled “Cretaceous Faunas of Appalachia.” My talk was titled “Western Appalachia Dinosauria and Associated Vertebrates of the Late Cretaceous of Southeast Missouri.” During the Summer of 2012 I filled two hall display cases with eye-catching specimens from the material donated by Hal and Mary Harris. This includes some rare and spectacular minerals. The display is in the west wing
hallway of the fourth floor of Benton Hall. If you like beautiful mineral specimens, then I encourage you to come and view this display.

Ricardo A. Flores
My research interests are astrophysical cosmology and applications of quantum field theory to the physics of elementary particles. This past year, however, my teaching load was doubled and I have not been able to complete any project. Nonetheless, I remain interested in the expected evolution in maps of the Sunyaev-Zel'dovich effect in clusters, and I may return to the subject of dark matter halo shape using the Bolshoi simulation carried out by my collaborators. Finally, my third student (David Coss) graduated in May and is now back in Tennessee.

Philip B. Fraundorf
My research involves materials, atomic resolution microscopes, computer simulations, and conceptual strategies for doing both nanoscale detective work and curriculum modernization. We’ve long provided the region with tools not otherwise available for examining the nanostructure of a growing variety of specimen types, including for example aerosol catalysts, integrated circuit silicon, carbon nanotubes, extraterrestrial materials, ferrofluids for drug delivery, and most recently ultrahigh temperature materials for leading-edge surfaces on hypersonic aircraft. This has helped put graduates into applied physics internships and jobs with companies that include MEMC, Seagate, Martin-Marietta, Mitsubishi Silicon-America, Motorola, and Cabot Electronics. Of four recent intellectual challenges, one lies at the intersection between (i) modern-day uses for graphene sheets and (ii) possible roles for carbon droplets in cool stellar atmospheres. Another involves the studies of gigascale integrated circuit silicon, a highly-ordered material tightly connected to future technology. A 3rd involves quantitative detective work on atomic periodicities and energy loss reflected in electron microscope images. A 4th involves the intersection between (a) log-probability measures, (b) the mathematical theory of model selection and (c) the quantitative study of correlations in complex systems with particular focus on the challenge of sustaining niche-network layer-multiplicities in metazoan communities. More on recent developments and on various educational explorations as well, may be accessed through:

http://www.umsl.edu/~fraundorf/index.html
pfraundorf@umsl.edu

Erika Gibb
I am an astrochemist/astrobiochemist studying chemistry in star formation regions and comets. One exciting area of astrophysical research is the search for organic molecules and water, important for life as we know it, in planet-forming disks around young stars that are similar to the young solar system and comets. I use a technique called infrared spectroscopy to study these. As primitive solar system objects, comets are also important for understanding how the solar system formed and evolved. In collaboration with Dr. Boncho Bonev at Catholic University of America, I received NSF funding in 2012 to continue our comet work, concentrating on chemical species that provide information about formation environment. In 2012, I published a chemical composition study of comet C/2007 N3 (Lulin) in Gibb et al. 2012, Astrophysical Journal, v750, 102. 2013 promises to be an exciting year, with two bright comets predicted to grace the night skies. My collaborators and I will be observing one of them with the Infrared Telescope Facility on Mauna Kea, HI in March and April 2013.

With graduate student Logan Brown and undergraduate Nick Kraftor, we are working on a study of water in the protoplanetary disks around objects DR Tau and AA Tau. We are using a technique called spectro-astrometry to determine the precise location of the water. Coupled with modeling, we will be able to determine how much water is in the disk, where it is located, and its temperature.

http://www.umsl.edu/~gibbe/gibbe@umsl.edu

Bob L. Henson
My activities now are mostly teaching and service for our department. In part, I have been staying on past my normal retirement age in order to help with instruction. Our number of physics faculty at the professorial level is at the lowest number that it has been since 1967. Currently, my teaching loads are heavy with twenty credit hours per academic year. Soon, I hope to retire from teaching in order to spend full-time on some mathematical physics research problems, which I have been studying. However, as of this date my retirement plans are incomplete.

http://www.umsl.edu/chancellor/tfgeorge@umsl.edu
Eric Majzoub

The research focus in our group is on the study and design of new materials for energy storage and conversion, such as hydrogen-storage materials, lithium-ion batteries, and pseudo- and super-capacitors. We employ a combined experimental and computational approach, utilizing first-principles techniques to understand the electronic, mechanical, and thermodynamic properties of the materials we study.

I was promoted to the position of Associate Director of the Center for Nanoscience, and along with the director George Gokel, will be re-organizing the center to more directly utilize the strengths of the CNS members from Chemistry, Physics, and Biochemistry and Biology.

Hydrogen storage research in the Majzoub group remains funded through the Department of Energy, Office of Basic Energy Sciences, with a new grant in collaboration with Washington University involving both Mark Conradi (Physics) and Sophia Hayes (Chemistry). This project currently employs one graduate student. The focus of the research is to identify important structural features of the hydrogen storage compound sodium alanate, or NaAlH₄, at temperatures and pressures of hydrogen that cause structural phase changes and coordination changes between Al and H atoms. These structures are important for the understanding of the decomposition mechanisms of NaAlH₄, and other similar compounds such as LiBH₄, and Mg(BH₄)₂, for example.

Recently, with funding from a NASA fellowship for one graduate student, and joint work involving a local technology company, we have begun investigating highly ordered nanoporous hard carbons for use in pseudo- and super-capacitors. These are devices that utilize high surface area electrodes to increase the capacity of energy storage over that of conventional electrolytic capacitors.

The most recent list of publications from the group may be found at: [http://www.umsl.edu/~majzoube/](http://www.umsl.edu/~majzoube/)

Bruce Wilking

Our spectroscopic survey of the Serpens star-forming region is complete and we are analyzing the results. The goals of these types of studies are to gain insight into the star-forming history and construct the distribution of stellar masses for each region. This work is part of Kristen Erickson’s Ph.D. dissertation. Kristen and I presented a preliminary analysis of echelle spectra for the brightest 18 Serpens objects at the 219th meeting of the American Astronomical Society (AAS) meeting in Austin, TX in January. In collaboration Erika Gibb and astronomers at NRAO and the AAS, we followed an outburst in water maser emission from a young binary system and used it to trace a jet from an unresolved companion to the T Tauri star Haro 6-10S. A paper was published in the Astrophysical Journal in July (2012, v753, 143-150).

[http://www.umsl.edu/~wilkingb](http://www.umsl.edu/~wilkingb)
bwilking@umsl.edu
Alumni Information

1981
Marty Mlynczak (B.S.) received the NASA Distinguished Service Medal at a ceremony at NASA Headquarters in August. Marty received UMSL’s Distinguished Alumni Award in 2007.

1986
Mark James (M.S.) is an Associate Professor of Physics and Science Education at Northern Arizona University. Mark received his Ph.D. in Science Education from Kansas State University in 2003.

1991
Michael Way (M.S., Ph.D. 1998) is a senior scientist at the Goddard Institute for Space Science and in NYC and a long-term visiting scientist in the Astronomy Department at Uppsala University in Sweden. He was principle editor for "Advances in Machine Learning and Data Mining for Astronomy" published in April 2012. I was also the Space Science Chair for the "Conference on Intelligent Data Understanding" in Boulder Colorado this year. He organized a conference in September in Flagstaff, AZ on “Origins of the Expanding Universe” to commemorate the 100th anniversary of V. M. Slipher’s first observation of cosmological redshifts with the 24-inch Alvan Clark refractor at Lowell Observatory. He is in the process of co-editing the conference proceedings which will be published by the Astronomical Society of the Pacific.

2000
Adam Tournier (B.S., M.S. 2002, Ph.D. 2005) is an Assistant Professor of Physics at McKendree University in Lebanon, IL. He was recently featured on FOX 2 News about a book found in McKendree’s library called Albert Einstein: Philosopher-Scientist which was autographed by Einstein in 1949.
http://fox2now.com/2012/12/07/einsteins-book/

2001
Glenn Carlson (M.S., Ph.D. 2012) is a Principal Engineer for Westinghouse Electric Company, Churchill, PA.

Jon Bailey (B.S.) is an assistant research professor in the lattice gauge theory group in the Department of Physics and Astronomy at Seoul National University.

2002
Vanessa Lauburg Cohen (B.S.) is an Upper School Mathematics instructor at the Garrison Forest School in Owings Mills, MD. Vanessa received her Ph.D. in astronomy in 2009 from the University of Maryland.

Bo He (Ph.D.) is working at ANSYS as a lead research and development engineer. He is also an associate editor for the Journal of Electromagnetic Waves and Applications and Progress in Electromagnetics Research Symposium.

2006
Tim Mason (M.S., Ph.D. 2011) is working for SADAR3D in St. Louis. They are making ground penetrating radar that makes a 3D image of the subsurface for civil engineering purposes.

2007
Melissa Pastorius Shenoy (B.S.) is a Data Analyst at Randstad Technologies in Mountain View, CA.

2008
Jinfeng Wang (Ph.D.) and his wife had a baby son in January. Jinfeng is a metrology engineer doing product development for Cabot Microelectronics Corporation.

2009
Blake Leonard (B.S.) works for the Monitor Instruments in Cheswick, PA which designs and builds mass spectrometers.

2012
Tim Ferguson (B.S.) is in the Ph.D. program in mathematics at the University of Illinois in Champaign-Urbana.

Krystal Kasal (B.S.) is a graduate student in physics at Washington State University in Pullman, WA.
Contributors 2011-2022

Thanks to all for your generous contributions! Please contact us if you made a contribution to the Department from November 15, 2011 – December 31, 2012 and your name does not appear.

Dr. Mary M. Allen
Bert A. and Patricia J. Amick
James M. and Janice E. Baker
Dr. Gabor Balazsi
Boeing Company
Christopher R. Dames and Annie Lukacz
Dr. Lu Fei and Dr. Lucy Wenzhong He
William B. and Mary C. Harms
David J. Harris and Margaret A. Diekemper
Dr. Bo He
Hershey Foods Corporation
Richard W. Heuermann and Kathleen Price
Charles F. and Carol R. Jones
Timothy A. and Dr. Michelle R. Kirchoff
Melvin R. and Regina M. Leong
Dr. Jeffrey L. and Linda A. Libbert
Michael H. McCartney
Eleanor I. McIntyre
Richard J. Melka
Dr. Martin G. and Pamela E. Mlynczak
Dennis J. and Pauline H. Moore
Peabody Energy
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Kelly L. Pisane
Kurt M. Pollack
Dr. Steven A. and Barbara C. Rutledge
Gordon Sarty and Kerry O'Shea
Dr. Elenore A. Schewe
Philip H. Schmidt
Dr. Chang Shen and Haoran Yi
Isaac B. Smith
Dr. Jinfeng Wang and Lu Li
Dr. Michael J. Way
Robert G. Wilking
Don C. and Susan Winter
Dr. Zhongyu Zhang
**University of Missouri-St. Louis**  
**Richard D. Schwartz Observatory**  
**Public Open House Schedule**  
**2013**

**Directions and Map** ([http://www.umsl.edu/~physics/astro/directions.html](http://www.umsl.edu/~physics/astro/directions.html))

<table>
<thead>
<tr>
<th>Date &amp; Start Time</th>
<th>Objects to View*</th>
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<tbody>
<tr>
<td>Saturday, March 16, 7:30pm CDT</td>
<td>Jupiter, Orion Nebula, Pleiades, Comet PANSTARRS</td>
</tr>
</tbody>
</table>
| Saturday, April 20, 8:30pm CDT  
*Astronomy Day!* | Jupiter, Saturn, M3 Globular Cluster, Beehive Cluster |
| Saturday, May 18, 8:30pm CDT | Jupiter, Saturn, Hercules Cluster, Beehive Cluster |
| Saturday, June 15, 9:00pm CDT | Saturn, Hercules Cluster, Albireo, Ring Nebula |
| Saturday, July 13, 8:30pm CDT | Saturn, Venus, Hercules Cluster, Ring Nebula, Albireo |
| Saturday, August 17, 8:30pm CDT | Saturn, Venus, Hercules Cluster, Ring Nebula, Albireo |
| Saturday, September 14, 7:30pm CDT | Saturn, Venus, Ring Nebula, Albireo, Andromeda Galaxy |
| Sat., Oct. 12 and Sun., Oct. 13, 7 pm CDT  
*Astronomy Day!* | Venus, Uranus, Ring Nebula, Albireo, Andromeda Galaxy |
| Saturday, November 9, 6:00pm CST | Venus, Uranus, Ring Nebula, Albireo, Andromeda Galaxy |

*All Open House sessions will include viewing of the *first quarter Moon*, along with additional deep sky objects such as visible nebulae and galaxies.*

For up-to-date information on the Open Houses, cancellations due to weather, or other special events in the sky, call the **Skywatch Hotline**:

(314) 516-5706

Public observing sessions are sponsored in part by the Missouri Space Grant Consortium.
Enclosed is my contribution of $_______.  Yes, I work for a matching gift corporation.

Designation for funds:
  Physics Scholarship Fund: _______________________
  Richard D. Schwartz Undergraduate Scholarship in Physics and Astronomy: _____________
  Physics & Astronomy Gift Fund: _______________________
  Richard D. Schwartz Observatory Gift Fund: _______________________
  Elaine & Frank Moss Hospitality Fund: _______________________

Please make check payable to UM-St. Louis, “Physics & Astronomy Fund” and return to:

   Department of Physics & Astronomy
   University of Missouri-St. Louis
   One University Blvd.
   St. Louis, MO  63121-4499

**********************************************************************************
Alumni Information Form:
Keep in touch!  Please let us know what’s new with you, both personally and professionally.

Name:________________________________________________________________________________

Address:______________________________________________________________________________

City,State,Zip:________________________________________________________________________

Company Name:________________________________________________________________________

Current Position:________________________________________________________________________

e-mail address:__________________________________________________________________________

News (to include in our newsletter):

_____________________________________________________________________________________

_____________________________________________________________________________________

When are you available for campus events?  ____________________________ _____________________

Thank you.

Comments or Questions: canavan@umsl.edu.

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