A MESSAGE FROM THE CHAIR

Typically an appointment as chair at NKU will last 4 or 8 years, and as I write this I am two months away from completing my 4th year as chair. Some months ago, I submitted a request to the Dean asking him to support my return to regular faculty status after the completion of my 4th year. My request was approved. I am looking forward to pursuing my passion in life by devoting much more of my time to teaching and activities that more directly impact the quality of education at NKU and student success.

I appreciate the kind words the many have shared with me regarding my performance as chair, and their desire to see me remain as chair. I have come to realize and appreciate at a much deeper level just how much the Dean’s office accomplishes each year as well as the many achievements of the faculty and staff in my department. I will not miss much about being chair, but I will miss the people who work with me on a daily basis. Some of the demands of my job as chair are well-known and visible to others, especially the challenge of managing a sudden sharp rise in the number of international students majoring in engineering technology. However, what I see as some of my greatest accomplishments may not be so readily visible to others. These deal with the day-to-day concerns from students that send me emails or stop by my office. One staff advisor recently described me as a “strong advocate for students”. It’s true that I spend a great deal of my time trying to resolve concerns from students to help them achieve their education goals, but I hope I did so without compromising on the integrity of our degree programs or the rigorous standards we demand of our students. Another accomplishment, also not readily visible, is support I have given to faculty in achieving their professional growth. I recall one faculty who was so concerned about negative feedback from students in one of his courses that he never wanted to teach that course again. I encouraged him to teach it again with some changes, confident he was very capable of teaching the course well while maintaining his high standards and obtaining positive feedback from students. He taught the course again and was proud of how successfully it went the second time. Helping others to achieve excellence in their work or education is the best part of the job as chair.

In the past year, there has been a renewed emphasis on student success at NKU, and Dean provided additional funding in support of this effort. In this newsletter you will read about some of the student successes in the past year. The Dean’s funding helped support a field trip for a geophysics class to conduct surveys in variety of geological conditions, materials for a Baja competition in engineering technology and student research in physics on black holes and carbon nanotubes. We are excited to offer such educational experiences for our majors that go well beyond the typical classroom setting.

As I leave this position as department chair, I am confident that quality of the
education we give to our majors is high. Our courses for majors place a strong emphasis on lab and field experiences. Co-op experiences and an original senior design projects are completed by all engineering technology majors. Over 50% of our majors in physics and geology participate in research work under faculty supervision. About a third of our graduates in physics and geology later achieve Masters’ degrees. Perhaps as high as 20% of our graduates go on to achieve PhD’s. As the quality of the education of our majors becomes better known in the community, the number of our majors has grown at a rate much higher than the average degree program at NKU. In the past year, the degrees conferred in our disciplines reached record numbers: 9 in physics, 19 in geology, 32 in mechanical and manufacturing technology; 14 in electronics engineering technology. It is important that as we grow, we resist the temptation to become like other big universities. We have rich educational experiences for our undergraduate students at a reasonable cost to them. I hope that will always be true.

Enjoy reading about the latest news from faculty, staff, students and alumni. Please feel free to contact us anytime to let us know what’s new in your life. My email and phone are given below, and I would love to hear from you.

Dr. John Filaseta
filaseta@nku.edu
(859) 572-5309

2013 OUTSTANDING GEOLOGY SENIORS

From left: Elizabeth May (outstanding senior in geology), Evan Clark (outstanding service in geology), and Dr. John Rockaway

FOR MORE INFORMATION CONTACT
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Highland Heights, KY 41099

OR VISIT THE DEPARTMENT WEBSITE AT:
pget.nku.edu

PHYSICS AND PRE-ENGINEERING GRADUATES

SPRING 2012
Cory Fine, BS
Louis Wolf, BA

FALL 2012
Daniel Ohlhaut, BA

SPRING 2013
Juan Correa, BS
Elizabeth Hall, BA
Steven Rickels, BS
Robert Spillman, BA
Ryan Toebbe, BA
Kirk Wallace, BS
GEODESY ALUMNI NEWS

JESSE AMUNDSEN - I have been working on a variety of projects for my employer, CostQuest Associates. The most public facing is the Connect America Fund Phase II Cost Model. I have also started working on a web mapping and analysis platform which will form the basis of a new suite of data products that we will begin to offer economic analysts and investors. I continue to climb and travel as often as I can while spending my free evenings working on small programming projects such as tinysite which aims to be an extremely lightweight but scalable website back end.

SAM BENNETT - I’m going on 4 years living in Las Vegas. I am currently a Sommelier at Wynn/Encore Hotel Spa and Casino in a restaurant called Botero. I am currently studying to sit the Advanced Sommelier exam though The Court of Master Sommeliers. I need 2-3 years more study time before I sit as the exam has a 16% pass rate historically. Drinking for a living doesn’t suck! Hope all is well with you!

MARIE COOPER - I am a field geophysicist using near surface geophysics. I am currently working on an old WWII military base - Fort McClellan. I am using an EM 61 collecting data so that the processors can map where possible UXOs are located. The backpack holds a battery which supplies energy to the coil - the part that looks like a cart - and the allegro, the piece in my hand. The coil sends out electromagnetic currents which then produce eddy currents in metallic and nonmetallic materials. The allegro displays the readings in millivolts, and when the coil goes over an object, the allegro displays a spike in the data in the shape of a parabola.

JASON KING - I am still working at the same consulting firm (SAS Environmental) and living in Akron, OH. The only major change in my life is I found out last Friday that I passed the PG portion of the ASBOG exam, so I am now a licensed KY Professional Geologist. Hardest exam I’ve ever taken.

RYAN PINGUELY – He sends us pictures from time to time – here he is somewhere in the Yukon.

GEODESY GRADUATES

SPRING 2012
Crystal Courtney, BA
Evan Draper, BS

FALL 2012
Marie Cooper, BS
Shanna Gilbert, BS
Andrew Hoh, BS
Eric Taulbee, BS

SPRING 2013
Andrew Adkins, BS
Tristin Atwood, BA
Whitney Butler, BS
Evan Clark, BS
Eric Goetz, BA
Nathaniel Hall, BS
Evan Hart, BS
Jason Haydu, BA
Sarah Henson, BS
Elizabeth May, BS
Jessica Napier, BA
Sean Reed, BS
Trevor Rowe, BA
Kirk Weber, BS
Frederick Wolnitzek, BS

OVERVIEW OF ENVIRONMENTAL GEOPHYSICS COURSE

In May of 2013 The Overview of Environmental Geophysics course was presented to the Kentucky section of the American Institute of Professional Geologist (AIPG). The Overview of Environmental Geophysics course was developed by the United States Environmental Protection Agency to inform environmental professionals about tools they can use to assist in remediation of impacted environmental sites. NKU became an external provider of the course in 2010. Through a National Science Foundation equipment grant equipment was purchased to allow participants the opportunity to use the equipment. Recently the national office of the AIPG has requested that Thomas Brackman M.S., P.G. produce a web based version of the course for distribution to the AIPG national audience.
2013 Colorado Field Course

The Great Unconformity

Standing, from left: Samantha Caldwell, Eric Fischer, Brad Vogelpohl, Alan Vennemann, Stephanie Burke. Sitting, from left: Rachael Delaney, Scott Wilson, Bethany Hopper, Sarah Lott, Vernon Bellamy, Christina Rebholz, Ash Eyler

Turkey Creek mapping

Garden of the Gods

Day trip to Rocky Mountain National Park. Top row, from left: Eric Fischer, Sarah Johnson, Bethany Hopper, Sarah Lott, Samantha Caldwell. Bottom row, from left: Dr. John Rockaway, Ash Eyler

Mapping Golden, Colorado from South Table Mountain
I wanted to take a moment to say thank you for all the good wishes we received after last year’s tornado devastated our area. Life is slowly returning to normal. Over a year later and most of the insurance paperwork is just now being finished. A big thank you goes out to the Northern Geology Club for their support during the cleanup. Club members came out and assisted with cleanup, sorting of lumber, nail pulling, loading and unloading of the pods and lots of moral support. The whole event has become a great learning event that has supplied me with a plethora of teachable moments. We sold the old farm to a neighbor and purchased one about a mile and a half north on the other side of the tornado path. Interestingly enough we found part of our old house roof on the new property. We are starting to build a new house and as of this writing we have a foundation with sturdy concrete walls. I will be working with William Attenweiler Ph.D. Associate Professor, Psychological Science NKU on a chapter of a book on Post-Traumatic Stress Syndrome from natural disasters. At least I now have a reason to be crazy.

This year has been great as far as the Laboratory for Applied Geophysics is concerned. Our 84 electrode, 8 channel electrical resistivity unit arrived at the end of last summer and has received considerable use. We have done everything from assisting a local geotechnical firm with a subsurface investigation of a family residence sliding down a hill, to demonstrating the equipment to professional geologist at an AIPG seminar. Eight students presented four posters at the celebration of student research. Marie Cooper became the first student to graduate and receive the title of Geophysicist. At least three other students will be going to graduate school for geophysics. Evan Clark and Trevor Rowe have worked on more projects than I can mention and there are some rising stars that you will definitely hear about in the future.

The Introduction to Geophysics class took a trip to the Upper Green River Biological Preserve just north of Mammoth cave for a weekend of fun in the Karst country. We met with 17 colleagues from Western Kentucky University geology to exchange ideas and to teach each other. According to the students the trip was a huge success. We sued electrical resistivity over a small cave and a very large sinkhole. Refraction Microtremor was demonstrated over a recently found cave and ground penetrating radar was used to investigate sediments infilling the sinkhole. We plan to return in the fall to investigate our hypothesis that the sinkhole is a abandoned section of cave carved by a the McCoy blue hole spring just across the Green River.

My research is focused on the paleontology of the Aaron Scott Quarry in central Utah, where I have been working for nine years. We have been continuing to collect the partial skeleton of the Barosaurus as well as many other animal remains. We now have parts of the skull and lower jaw of the Barosaurus, which is quite exciting because they have never been found before. We also have the first jaw of a mammal from the site. I have three students working on research projects related to the site currently. Samantha Caldwell is studying the oxygen isotopes across a cross section of one of the Barosaurus bones to determine the diet of the animal and to show that the animal experienced a period of drought near the end of its life. Nathaniel Hall is studying Coelurus and Dryosaurus remains from the site and recently discovered that we have pieces of a baby Dryosaurus in the material that has been collected. Juan “Johnny” Maldonado is studying the sphenodont reptiles from the site. It appears that we have one or two new species of the genus Sphenodon. Samantha, Nathaniel and Johnny presented their research in Puerto Rico at the southeastern section of the Geological Society of America this spring. This summer I will be taking four students in the field to the site, including three new freshmen. They have received STEM grants to fund their travel and they will be conducting research upon their return from the site.
Dr. Sharanthie Fernando of the Department of Physics and Geology has been engaged in research related to General Theory of Relativity and black hole physics for many years. This article highlights some of the accomplishments by her and her research students during the past year.

General Theory of Relativity was developed by Albert Einstein in 1915 to describe the gravitational force. It is a geometrical theory and it describes the effects of the gravitational force around a massive object by the curvature of the space-time around it. One of the profound predictions of General Theory of Relativity is the existence of black holes. A black hole is a massive object surrounded by a fictitious surface called the “horizon”. The gravitational force due to the mass inside the black hole is so strong that even light cannot escape from the horizon. Recent observations suggest that many, if not all, galaxies in the universe have massive black holes at the center.

Dr. Fernando and her research group has published several papers in journals this year. They also presented their work in conferences, seminars and at the Celebration of Research and Creativity at NKU. The students who took part in black hole research this year are, Juan Correa, Kevon Reis, Scott Meadows and Jonathan Wright. They are all physics majors.

**PAPERS PUBLISHED THIS YEAR:**


4) “Remarks on null geodesics of Einstein-Born-Infeld black holes”, S. Fernando, ISRN Mathematical Physics (2012) 869069


**CONFERENCE, SEMINAR PRESENTATIONS BY DR. FERNANDO**

- Spanish Relativity meeting: University of Minho, Guimaraes, Portugal, September 2012, Talk with a title “Null geodesics of black holes in string theory.”

- East Coast Gravity meeting: Syracuse University, April 2012, Talk with a title “Null geodesics of black holes in String theory.”

- “Null geodesics of black holes in string theory,” High energy seminar at University of Cincinnati, May 2012.

- “Black holes: what are they?,” Lunch seminar at Northern Kentucky University, October 2012.

- “Black holes: what are they?,” Seminar for 8th graders at Madeira Middle School, Cincinnati, April 2013.

**STUDENT PRESENTATIONS**

- “Quasi-normal modes of black holes,” Juan Correa, Spring 2013, Posters in the Capitol, Frankfurt, KY.

- “Quasi-normal modes of black holes,” Juan Correa, Council on Undergraduate Research- Undergraduate research highlights, Spring 2013, Volume 33

- “Quasi-normal modes of black holes,” Juan Correa, Poster presentation, Celebration of Research at NKU, April 2013

- “Orbits of massive particles around a charged black hole surrounded by dark energy”, Scott Meadows, Poster presentation, Celebration of Research at NKU, April 2013

- “Motion of massive test particles around a neutral black hole surrounded by dark energy,” Jonathan Wright, Poster presentation, Celebration of Research at NKU, April 2013

- “Photons around a charged black hole surrounded by dark energy,” Kevon Reis, Poster presentation, Celebration of Research at NKU, April 2013

*Physics major, Kevon Reis presented his research work at the Celebration of Research at NKU in April 2013. The title of the poster was “Null geodesics of the Reissner-Nordstrom black hole surrounded by the quintessence.”*

*Jonathan Wright (physics major) presented a poster at the Celebration with the title, “Motion of test particles around a neutral black hole surrounded by dark energy.”*
Physics major, Scott Meadows, presented his work at the Celebration of Research with a title, “Orbits of massive particles around a charged black hole surrounded by dark energy.”

Juan Correa, a physics major presented his research at the Celebration of Research at NKU. The title of the poster was, “Quasi-normal modes of Bardeen black holes.” This work is published in Physical Review D.

**Baja 2013**

The competition was held at The Rochester Institute of Technology and Hogback Hill Motocross Track in Rochester, New York from June 6th to the 9th.

From left to right: Nathan Rogers, Nick Bertke, Jayson Lotz, Eike Lohrbach, Dan Walters and Tyler Spaeth.
**MAHMOOD ALHAKEEM**  
*Fabrication and Characterization of Carbon-Fiber-based Composites*  
**FACULTY SPONSOR(S):** SEYED ALLAMEH, PHYSICS & GEOLOGY

**ABSTRACT:** Structurally tough materials are needed to increase the resistance of structures against dynamic shear forces typical of earthquakes. Naturally tough biomaterials such as nacre use a layered pattern combining hardness of ceramics with the ductility of polymers in alternate layers. Mimicking such structures, it is possible to make composites that can be used in the fabrication of durable houses. Reinforcing these composites will give them the tensile strength required for structural materials. Preliminary results of a study on the effect of reinforcement on the toughness of structural composites will be presented.

**AMR NAJJAR, ADNAN ALMUWALLAD, HANI ALHARBI**  
*Algea-Based Biofuel Instrumentation for Household Application*  
**FACULTY SPONSOR(S):** SEYED ALLAMEH, PHYSICS & GEOLOGY; MIRIAM KANNAN, BIOLOGICAL SCIENCES

**ABSTRACT:** The high levels of nutrient in household sewage effluent may be used for growth of algae to produce biofuel. A compact bioreactor is designed and built to grow algae and harvest biofuel in an automated self-sustaining continuous process. The process requires light and flow of effluent both of which can be supplied automatically. Algae are then mechanically crushed and oil is separated and converted into biodiesel. The crushed algae may be used for diatomaceous earth or nanotechnolgical applications, and the resulting water is suitable for irrigation. The mechanics and engineering aspects of the growth bioreactor are discussed here.

**SAMANTHA CALDWELL**  
*Paleoenvironmental Interpretation Through Oxygen Isotopes in Phosphate From Barosaurus Indicate Increasing Aridity at The Aaron Scott Quarry (Morrison Formation, Jurassic Period)*  
**FACULTY SPONSOR(S):** JANET BERTOG, PHYSICS & GEOLOGY

**ABSTRACT:** Taphonomic research, stratigraphy, and oxygen isotopes from a Barosaurus femur were used to determine climate patterns and their effects on the animal’s diet in the Late Jurassic of Utah. Data suggests there was an increase in aridity over the animal’s lifetime. Oxygen isotopes of phosphate from the femur of the Barosaurus range from 13-16 per mil O18 from the inner part of the bone to the edge. Millimeter-scale fluctuations in the d018 of 1-2 per mil may be evidence of yearly fluctuations. The trend is increasing in d018, showing a climate change at the end of the animal’s life.

**JUAN MALDONADO**  
*Opisthias (Sphenodontia) From The Aaron Scott Quarry (Morrison Formation, Jurassic Period) of Central Utah*  
**FACULTY SPONSOR(S):** JANET BERTOG, PHYSICS & GEOLOGY

**ABSTRACT:** The Aaron Scott Quarry in central Utah (Jurassic Period) is unusual in that micro fossils and macro fossils are found together. In the quarry several specimens of Opisthias sp. have been recovered. These specimens represent at least four individuals. Specimens include two maxilla, one pterygoid, and four dentaries. The four dentaries exhibit variations that suggest they are from different individuals and possibly different species. The dentary differences vary from the shape and length of the teeth, to the different structures of the jaws. The variability in these specimens suggest at least two different species of Opisthias from this site.

**DANI DAUGHERTY, BRYCE HAMILTON**  
*Applied Geophysics: Ascending By Looking Down*  
**FACULTY SPONSOR(S):** THOMAS BRACKMAN, PHYSICS & GEOLOGY

**ABSTRACT:** Harvest Community Church in Falmouth, KY is in the process of constructing a new church. In an effort to lower cost we propose to map the subsurface on the site. Unknown cost in foundation construction can cause hardships for projects with a tight budget. It is our primary objective to discover the rock ripability and locate any anomalies that hinder the construction of the new church. To obtain this information we will be using Ground Penetrating Radar (GPR), Refraction Microtremor (ReMi) and Electrical Resistivity.
**ABSTRACT:** The Laboratory for Applied Geophysics in collaboration with Dr. Hopfensperger will delineate a wetlands project/retention basin and determine if siltation rates can be measured. We will use a Total Station to conduct a topographic survey of the retention basin next to the Burlington Elementary School in Burlington, Kentucky. We will also conduct an electrical resistivity survey across the bottom of the basin to determine if we can see any siltation structures from the influx of sediments.

**TREVOR ROWE**  
*Geophysics in Archaeology: A Comparative Study*  
**FACULTY SPONSOR(S):** THOMAS BRACKMAN, PHYSICS & GEOLOGY

**ABSTRACT:** Using geophysics we can map subsurface features. This is applied in many fields from construction to the designing of mines. The field of Archaeology is utilizing geophysics to do what was once thought of as impossible. Archaeologists now use geophysical methods to excavate data from the ground without even touching a shovel. Geophysical techniques can be used to gather data on depth, a three-dimensional location, possible material composition, relative size and orientation. Using two different principles of geophysical surveying, electrical resistivity and electromagnetism, we were able to locate and map possible locations of burials belonging to the Fort Ancient culture.

**PHYSICS & ASTRONOMY**

**VINCENT CAMPBELL**  
*Synthesis of Carbon Nanotubes Employing Chemical Vapor Deposition Technique and Their Characterization Utilizing Scanning Electron Microscope*  
**FACULTY SPONSOR(S):** WAYNE BRESSER, PHYSICS & GEOLOGY; CHARI RAMKUMAR, PHYSICS & GEOLOGY

**ABSTRACT:** Our lab has successfully produced carbon nanotubes (CNTs) using a thermal Chemical Vapor Deposition (CVD) method. The process starts with iron particles that act as catalyst seeds around which the carbon will begin pyrolysis. Acetylene, hydrogen, and argon gasses were delivered at varying flow rates, temperatures and pressures to grow CNTs. The various CNTs will be examined utilizing NKU’s scanning electron microscope (SEM). This will allow us to establish a method of producing CNTs for future use to enhance the strength of ferrite toroids used as pressure sensors.

**JUAN CORREA**  
*Quasi-normal modes of a spin 0 particle around a charged black hole*  
**FACULTY SPONSOR(S):** SHARMANTHIE FERNANDO, PHYSICS & GEOLOGY

**ABSTRACT:** In this study, we have computed the oscillation frequencies which are called quasi-normal mode frequencies (QNM) of a spin 0 particle around a charged black hole in non-linear electrodynamics. The frequencies are computed for various values of charge $q$, mass $M$ and the spherical harmonic index $l$. We have compared the values we have obtained with the QNM frequencies of the black hole of the Maxwell’s electrodynamics.

**KEVON REIS**  
*Photons Around Charged Black Holes Surrounded by Dark Energy*  
**FACULTY SPONSOR(S):** SHARMANTHIE FERNANDO, PHYSICS & GEOLOGY

**ABSTRACT:** In this project, we study an electrically charged black hole surrounded by quintessence matter. Quintessence matter is a candidate for dark energy that exists in our universe. The project is focused on the orbits of the massless particles (photons).

**JONATHAN WRIGHT**  
*Motion of Massive Test Particles Around a Neutral Black Hole Surrounded by Dark Energy*  
**FACULTY SPONSOR(S):** SHARMANTHIE FERNANDO, PHYSICS & GEOLOGY

**ABSTRACT:** In this project, we study a neutral black hole surrounded by quintessence matter. Quintessence matter is a candidate for dark energy that exists in our universe. The project is focused on the orbits of the massive particles.

**JESSICA KERBY**  
*New Atmospheric Model for CREST*  
**FACULTY SPONSOR(S):** SCOTT NUTTER, PHYSICS & GEOLOGY

**ABSTRACT:** The Cosmic Ray Electron Synchrotron Telescope, CREST, is a balloon-borne experiment that detects high energy cosmic rays. This is a comparison between previous and proposed atmospheric models for use in the data analysis of CREST. The models relate atmospheric density, pressure, and temperature to altitude. The goal of this comparison is to subsequently create an atmospheric model that resembles reality as closely as possible.

**KIRK WALLACE**  
*CREAM and ISS-CREAM Simulations*  
**FACULTY SPONSOR(S):** SCOTT NUTTER, PHYSICS & GEOLOGY

**ABSTRACT:** The Cosmic Ray Energy and Mass instrument, CREAM, is a multi-university collaborative balloon experiment that aims to measure both the energy and mass of high ($1\ TeV$) energy cosmic ray nuclei. There are currently two versions of the CREAM detector; one version will fly on a traditional balloon flight (CREAM), while the other will be docked on the International Space Station (ISS-CREAM). Currently both instruments are modeled with Monte-Carlo simulations to aid with the detector’s design. This work updates the simulations with geometry modifications for both the CREAM and ISS-CREAM experiments.
TREIRENTS

DR. C. DALE ELIFRITS
Director of Pre-Engineering, Visiting Professor of Geology

In 2000, Dr. C. Dale Elifrits retired from the University of Missouri (Rolla) where he held the position of Associate Director of the Freshmen Engineering Program and Professor of Geological Engineering. Two years later, NKU was fortunate to hire Dale as Director of Pre-Engineering and Outreach for CINSAM. For 10 years, Dale was awarded the Dorothy Westerman Hermann Endowed Chair in Science. Currently, he is in his final year at NKU, retiring for a second time in May. For CINSAM, Dale was active in promoting/leading engineering summer camps and in recruiting STEM majors. Between 2004 and 2006, Dale served as the Interim Director of CINSAM. Since he began his position as the Director of Pre-Engineering (2002), the number of pre-engineers at NKU has more than doubled. Dale always put student success at the heart of all that he does. He taught a popular freshmen orientation course (PHY 100) in engineering design that received high praise from his students. This course not only provided freshmen with campus success skills, but also with an overview of various career paths in engineering. He has been an advisor to a large number of pre-engineers and worked to solidify the pre-engineering articulation agreements NKU has with the University of Kentucky and University of Louisville. Dale was proud to mention that UK faculty reported back to him that NKU has the best transfer students into their engineering programs. Dale’s expertise as a geological engineer has resulted in over 20 funded grants and numerous journal articles. He continues to be very active as a leader in professional societies (Society of Mining, Metallurgy & Exploration; Association of Environmental & Engineering Geologists) and on the Accreditation Board for Engineering and Technology. Dale will be deeply missed.

DR. CHARLES HAWKINS
Professor of Physics

Dr. Charles Hawkins was hired at NKU in 1980 as Associate Professor of Physics. He was tenured in 1983 and promoted to Full Professor in 1986. Chuck served as the Director of Academic Computing from 1988-94, and during that period he did a 7-month stint as Interim Associate Provost. He played a leadership role in the installation of the first campus-wide network. From 1998 to 2009, Chuck served as chair of the Department of Physics and Geology. As chair he obtained nearly $3 million from NASA in support of the planetarium. It is unlikely that the planetarium would have become a reality without Chuck’s leadership. The Planetarium has over 8000 public visitors annually and is used for teaching over 1200 NKU students each year. After serving as department chair, Chuck was elected Faculty Regent to the Board where he was involved in the search for a new President at NKU. After retirement, Chuck will remain active in service to NKU. He is determined to see the completion of a project that has the goal of building an observatory on top of Founders Hall. Our department family is very proud of Chuck and his accomplishments. Chuck will be appointed to Professor Emeritus status upon his retirement. He will be deeply missed.

DR. RAYMOND MCNEIL

As NKU’s one and only professional astronomer, Dr. Raymond McNeil is best known for his devotion to teaching, his service to the university and his community outreach activities. Some years ago, Ray was presented with the first Kentucky State Park Service Award for his series of astronomy observing sessions at Big Bone Lick State Park. Over his 32 years as a faculty member with the university he has given numerous observing sessions to school and community groups in the greater Cincinnati area. In university service, Ray led a committee in developing the paper-based student evaluations of instructors and courses which was used by the university for 20 years. As chair of the Professional Concerns Committee and co-chair of the Faculty Handbook Revision Committee, Ray led the three-year process of completely revising the Faculty Handbook, which was ultimately approved by the Board of Regents in 1994. Ray was formally recognized by the Board for his contributions to this achievement. Ray has had a very meaningful and positive impact on the lives of our students and others. Although he promises that he will remain active in support of NKU’s Planetarium and continue conducting astronomy observing sessions, Ray will be deeply missed.
**Promotions**

**Dr. Sharmanthie Fernando**  
Professor of Physics

Dr. Sharmanthie Fernando started at NKU as a temporary lecturer in 1998 as she was finishing up her PhD in physics at the University of Cincinnati. Since then she was appointed to a tenure-track position, and by 2007 was promoted to the rank of Associate Professor with tenure. Sharmanthie will begin the 2013-14 academic year at the rank of Full Professor. Sharmanthie excels in teaching, scholarship and service. Her popularity as a teacher can be seen in that when she teaches General Physics her sections will fill to capacity before any of the other sections. One student comments: “Dr. Fernando is just awesome! She has gone out of her way to help me.” Another student: “She is one of the best professors I’ve ever had. She makes physics fun, challenging, but easier to learn.” In service, Sharmanthie served on the University Curriculum Committee and has implemented significant revisions to the physics curriculum. She has been editor of our annual department newsletter which is mailed out to our department alumni. In her research area of General Relativity and Gravitation, she has authored 23 peer-reviewed journal articles and has over 270 citations. Her work on black holes is very theoretical, but she is able to involve NKU students in mathematical modeling and simulations. Several of her students have achieved results that led to them becoming co-authors in leading physics journals with Sharmanthie. Congratulations to Sharmanthie for a well-deserved promotion!

**Physics Alumni News**

**Mark Gieske**, graduated 1986 with a BS degree in Physics.

After graduating from NKU, Mark went on to earn a Masters degree in physics at Miami University. He was employed for 8 years at a company called SRL in Dayton, Ohio, where he worked on a system that performed automated NDT (non-destructive testing) of jet engine rotors for the USAF with the use of eddy-current probes to detect LCF (low cycle fatigue) cracks on the surface of these parts. After that, he was hired on at McDonnell Douglas to work on training systems. Two weeks after he started work at McDonnell Douglas, the company merged with Boeing. Mark has been working for Boeing in St. Louis for the past 15 years. He develops software for military flight trainers and works on simulations for both fixed wing and rotor craft trainers. Mark tells us that he even use principles that he learned in physics to solve problems that he encounters. Dr. McPherson (who was department chair before he retired in 1998) has a daughter, Sandy, who also works for Boeing’s Training Systems. Mark has been married for nearly 23 years, and has 2 children in college. The rest of his family still lives in Northern Kentucky, so he makes trips to the region 3 or 4 times a year.

**Engineering Technology Graduates**

**Spring 2012**  
Raed Alfarayez, BS  
Abdulaziz Almutiri, BS  
Mohammed Alnajrani, BS  
Ghaleb Alroole, BS  
Hani Alshamrani, BS  
Abdullah Alshehri, BS  
Hans Lentz, BS  
John Maggard, BS  
Darius Stewart, BS

**Fall 2012**  
Mazen Alahmari, BS  
Bandar Aldulaijan, BS  
Abdulaziz Khalid Alhashash, BS  
Khalid Aljubayr, BS  
Abdulla Al Ibdah, BS  
Masood Almalki, BS  
Turkey Abdulaziz Almanaa, BS  
Abdullah Al Ramadan, BS  
Delbert Johnson, BS  
Clara Schutzman, BS

**Spring 2013**  
Bright Ablordeppey, BS  
Faisal Mahdi Al Dhawi, BS  
Raid Alhafeeeri, BS  
Rami Alamri, BS  
Saeed Alamri, BS  
Hussain Alfakhr, BS  
Ibrahim Alhaik, BS  
Mahmood Mohamed Alhakeem, BS  
Ahmed Alharby, BS  
Fahad Alkhater, BS  
Mohammed Al Hajji, BS  
Abdulrahman Aljabr, BS  
Akram Almarzooq, BS  
Adnan Almuwallad, BS  
Abdullah Mohammed Alotaibi, BS  
Rayan Al-Safrani, BS  
Ahmed Alatiiyyah, BS  
Ayedh Khalaf Alqhtani, BS  
Hussein Ali Al Qurain, BS  
Kimberly Campbell, BS  
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