

## OPPORTUNITIES FOR UNDERGRADUATES FIELD RESEARCH IN AFRICA



Dr. Solomon Bililign, Professor of Physics and Director of the NOAA-ISET Center (National Oceanic and Atmospheric Administration - Interdisciplinary Scientific Environmental Technology) at North Carolina A&T State University is the co-Principal Investigator for two National Science Foundation (NSF) funded projects providing field courses and research opportunities in Africa for undergraduate students.

### AfricaArray

This project, initially funded in 2006 under NSF's PIRE (Partnership for International Research and Education), is a four-year, multi-faceted geo-science initiative to promote combined educational and research programs that will 1) build human and instrumental capacity in Africa and the U.S. for the geo-sciences, 2) address fundamental geo-science questions of academic, economic and societal importance, and 3) enhance diversity in the geosciences, both in Africa and the U.S.

Penn State serves as the lead university in partnership with NCA&T who work together with University of the Witwatersrand (Wits) in Johannesburg, South Africa. Activities in the U.S. for undergraduate students are offered jointly by NCA&T and Penn State. International experiences are available through a Geophysics Field Course in South Africa, or through African Seismic Station research projects.

### The Field Course



*NCA&T students participating in field course*

The 8-week long Geophysics Field Course is designed to provide physics, math, engineering and geo-science students from historically black colleges and universities with exposure to geophysics field methods, modeling techniques, and career opportunities.

Students taking this course become familiar with field and modeling methods commonly used in hydrocarbon, mineral and water exploration, as well as in basic Earth Science research.

Following two weeks of orientation at Penn State, students travel to Johannesburg where they work with students from Wits to design a field project. Following 10 days at a remote bush camp spent collecting and interpreting geophysical data (gravity, magnetic, seismic, radar, electromagnetic), they return to Wits to interpret and analyze the data. In the field students have an opportunity to visit a platinum mine and in Johannesburg they attend cultural events and participate in sightseeing.



*NCA&T students in the field*

The final two weeks of the course are at Penn State where students complete a project report and make a formal project presentation. Students admitted to the course receive a stipend and their expenses for travel, food and lodging are covered. Six NCA&T students have participated in the field course thus far, and 9 more are expected to participate during the next three years.

The course is part of the Summer Research Opportunities Program (SROP) at Penn State, which also supports a research associate at NCA&T to teach and develop geophysics research and education, and the establishment of a broadband seismic station in the Physics Department at NCA&T.

### Seismic Station Research

During 2008-2010, students participating in African Seismic Station research projects will travel to Uganda and Tanzania to help install seismic stations which will record earthquakes from the East African rift valleys. The projects will also provide opportunities for students to spend time at Penn State doing research with the seismic data to investigate Earth structure beneath the rift valleys.

### IRES Grant

The NSF International Research Experience for Students (IRES) grant for which Dr. Bililign has received funding operates in collaboration with Addis Ababa University (AAU) in Ethiopia. It offers students with research experiences in atmospheric sciences, geosciences and space sciences and is helping to develop a sustainable educational and research collaboration between NCA&T's Department of Physics and AAU's Department of Physics and Geophysical Observatory.

The research focus is on the Afar Desert region in the northeast region of the country, home of the main Ethiopian rift. This complicated continental rift deformation process is under observation by geoscientists around the world where one can see active faults, fresh deformations, and lava flows in different rift segments with several overlapping activities.

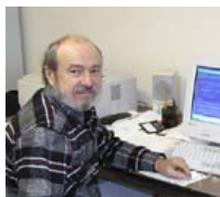
The program presents an ideal opportunity for student field trips offering unique experiences not available in the U.S. Ethiopia is located close to the equator and Addis Ababa is a city about 2.5 km above sea level, surrounded with hills. Because of its unique position, east-west equatorial electrojets in the ionosphere have been under investigation by the Geophysical Observatory at AAU. Three NCA&T students participated in the program during summer 2007.



## INTERNATIONAL NUCLEAR RESEARCH COLLABORATION

NCCU's Department of Physics has a mission to recruit and educate for leadership in science, to promote the profession of physics, to advance knowledge in the field of physics, and to serve the scientific and manpower needs of the community and nation. It is also serving the world through its long history of involvement in nuclear research, attracting international research faculty renowned in the field and contributing to scientific advancement.

### Scientific Breakthrough



*Dr. Vladimir Suslov*

Collaboration in nuclear computational physics involving Dr. Vladimir Suslov, a research professor at NCCU and also associated with the Institute for Physics at St. Petersburg State University in Russia, Dr. Mikhail Braun, professor at NCCU, and Dr. Branislav Vlahovic, Department Chair at NCCU, has resulted in the solution of a long standing fundamental problem in nuclear physics: calculation of the proton induced deuteron breakup above threshold with inclusion of Coulomb forces. This is a challenging problem attempted without full success by many groups for the last five decades.

The developed unique computer code will allow for the first time rigorous calculation of observables for  $pd$  system at energies above the deuteron breakup threshold. This will enable extensive study of three-nucleon system which is the source for our understanding of the nuclear forces acting between two, three and many nucleons, which are the basis for the construction of nuclear physics.

### Nuclear Non-Proliferation



*Dr. Kinney Kim*

Dr. Kinney H. Kim, professor of Physics at NCCU, has been involved with the issue of Nuclear Non-Proliferation, Security and Peace on the Korean Peninsula for the past four years. His study on the Democratic People's Republic of Korea's (North Korea) Nuclear Weapon Development program was conducted by assessing the nuclear fissile material enrichment project, its level of science and technology infrastructure, and operation of its 5.0 MW nuclear reactor facility located in Yeonbyun, North Korea. Last June (2007), Dr. Kim presented the report at the International Conference on the Political Stability on the Korean Peninsula hosted by the International Council on Korean Studies and the University of Hawaii in Honolulu.

## East Meets West

### Nanjing Normal University Faculty Exhibition



*Chancellor Meadors with Nanjing Normal faculty and An exhibit piece.*

The University of North Carolina at Pembroke and Nanjing Normal University in China are promoting the development of Study Abroad and Exchange opportunities for art students at both institutions. In October UNCP's A.D. Gallery hosted the first exchange exhibition featuring works by faculty members of Nanjing Normal University. The show included fine examples of contemporary Chinese calligraphy, painting, and photography.



*A Chinese painting from the exhibit*

### China Initiative

In November 2007, a delegation of faculty and administrators visited 6 universities in Beijing, Xi'an, Dali, and Yunnan, China. The universities include North China Institute of Science and Technology, Northwest A & F University, Xi'an Siyuan University, Xi'an International Studies University, Dali University and Yunnan University. Three new partnerships were established and existing partnerships were expanded to include faculty and student exchanges.



## FINALLY! ANOTHER AMERICAN GRAND PRIZE WINNER AT PRIX de LAUSANNE



Kyle Davis, a high school senior studying ballet in the School of Dance at NCSA, was one of two American dancers to win a Grand Prize at the Prix de Lausanne in Lausanne, Switzerland. The Prix, held in February, is one of the

premier dance competitions in the world and Davis' win is the first time any American has won in more than a decade.

"North Carolina and its School of the Arts have reason to be proud," said NCSA School of Dance Interim Dean Alex C. Ewing. "The Prix de Lausanne is possibly the ultimate test for a young dancer, and candidates from every continent and dozens of countries congregate each year to compete for its top prizes. Kyle Davis is one of our very best students and individuals, and we all congratulate and rejoice in his recent most prestigious achievement."

Davis danced the Prince Albrecht Variations from Act II of "Giselle," and "Spring and Fall," a contemporary solo choreographed by John Neumeier.

"The feedback that I got from the judges and others was that Kyle was the one who looked professional," said Warren

Conover, assistant dean of the NCSA School of Dance. "Kyle did the variations and told a story. The other participants just did the steps. He was the only musical dancer."

The Prix de Lausanne, held annually since 1973, is an international competition for young dancers of all nationalities between the ages of 15 and 18 who wish to pursue a professional career. The purpose of the Prix de Lausanne is to facilitate the professional debut of its young prize-winners by granting them scholarships that enable them to improve their skills for a year in one of the schools which are partners of the Prix, or apprenticeships in one of the professional dance companies also partnering with the Prix. Competitors benefit from individual discussions with members of the jury, take daily lessons and workshops, meet dance professionals, and share their experiences with competitors from a wide range of countries.

This is not the first time that an NCSA student has competed or won at the Prix de Lausanne. Gillian Murphy, now a principal dancer with American Ballet Theatre, won a Prix de Lausanne Hope Prize in 1995. In 1985, Edward Stierle, now deceased but formerly with The Joffrey Ballet, won a Gold Medal at the competition.



## RICH AND VARIED INTERNATIONAL OPPORTUNITIES FOR STUDENTS

As part of a continuing effort to promote international experiential learning, UNC-Asheville sent 14 students and 2 faculty/staff members to Bolivia over an extended spring break trip to engage in international service learning with a medical mission from Western North Carolina. The group engaged in a variety of projects, including a project organized by UNC-Asheville staff and students to test for lead contamination in the area. In what is becoming an annual spring break tradition, five UNCA students traveled to the United Arab Emirates for the "Women a Global Leaders" Conference. Generous gifts by Asheville-area residents and friends of UNC-Asheville have supported these experiences and others like them.

This summer, UNC-Asheville students have the opportunity to travel with faculty to Honduras, Bolivia and Spain to lend a hand in service-learning. Faculty will accompany students as they teach a focused curriculum, enriched by hands-on cultural encounters. In Honduras, students will live and work in local villages, and also enjoy excursions to the rainforest, as they explore the impact of development in Central America. In Bolivia, students will learn about the fight for indigenous rights and implications for social justice. They will travel to various cities and villages and meet local leaders and activists. In southern Spain, students will focus on immigration issues in the gateway city of Granada. Each student will develop a research project with a service-learning component.

UNC-Asheville students benefit from other cultural exchanges as the university welcomes visiting scholars from India. Ashwini Gokhale, economics professor at CHM College (one of the largest institutes of Mumbai University), visited the campus in April for a brief residency. Literature professor, Rambau Badode, from Mumbai University will spend two weeks at UNC-Asheville in the fall to lecture on American and African-American Literature.

**New Campus**

Within five years, Incheon City in South Korea will be home to a North Carolina State University campus.



Recent agreements signed by NCSU and Incheon's Free Economic Zone (IFEZ) call for adding a large NC State presence to IFEZ's Center for East-West Intellectual and Cultural Exchange, a South Korean hub of economic growth akin to North Carolina's Research Triangle Park. IFEZ is a burgeoning area located near the country's capital, Seoul.

NCSU will explore the opportunity for its own Asia campus in IFEZ, joining a handful of other universities. When fully operational, NCSU's campus is expected to accommodate approximately 3,000 students, most of them undergraduates. Officials expect that at each U.S. university IFEZ campus about 40 percent of the students will hail from South Korea, with 25 to 30 percent coming from the United States and the remaining 25 to 30 percent coming from other countries, most likely Asian countries like China, India and Japan.

NCSU undergraduates will be able to study at the IFEZ campus for semesters or academic years. NCSU faculty will be able to teach and do research.

"Incheon is becoming the hub of education in Asia, and an Asia campus provides a base in Asia for NCSU," said Dr. Bailian Li, vice provost for international affairs at NCSU. "Two billion people live within a three-and-a-half-hour flight from Incheon International Airport."

NCSU, along with The Salk Institute for Biological Studies in San Diego, California and Stony Brook University in New York have also agreed to join the establishment of a joint research lab in IFEZ that will focus on training graduate students and faculty research with Korean universities, particularly in the fields of biotechnology and information technology. NC State faculty and students will be able to conduct research in South Korea while enjoying the benefits of an international experience.

The price tag for both the campus and the research lab is \$10 million per year for the next five years. Funds are being

provided by IFEZ and South Korea's central government.

Campus land and facilities will be rent free, although NC State will pay for maintenance and utilities from tuition and fees collected. The Korean government will provide student residence halls and faculty housing.

Dr. Heeyhon Song, chairman of the Asia Development Institute, who helped cement the NC State-IFEZ agreements, says South Korea is using Research Triangle Park as a model for IFEZ. He adds that South Korea feels pressured by the up-and-coming economies in China and India, and is looking to develop its own niche as a world power in biotechnology, information technology and creative cultural industry. Agreements with U.S. universities like NC State, he says, are the precursors to attracting research and development, followed by business and industry.

This development resulted from an October 2007 trip to South Korea and Japan by a number of NC State administrators and faculty - including Provost Larry Nielsen, Graduate School Dean Terri Lomax, and Bailian Li.

**Dual Ph.D. program with Seoul National University**

The trip also resulted in a unique agreement to conduct a dual Ph.D. program in genomics with Seoul National University (SNU), set to launch this fall. This, the first global dual Ph.D. program for NCSU and SNU will allow students to obtain a Ph.D. degree from both universities in genomics if they fulfill the degree requirements of both institutions. A joint workshop was held by faculty from both universities this January at NCSU, and students are being admitted for the dual degree program this fall.

The strength of alumni relations in South Korea was revealed during the trip, as 31 of the informal 350-member South Korean NCSU alumni club attended a reception in Seoul. Among the attendees were the executive vice president of Samsung, a vice president of Huneed Technologies, and a director of the Defense Agency for Technology and Quality.

The NCSU delegation paid a visit to Samsung Electronics where they were hosted by Executive Vice President Changsik Choi and seven other NCSU alumni.

**And More**

NCSU administrators also signed a number of academic agreements with other Korean universities, including two private universities that emphasize science, technology and engineering disciplines.



## THE FRENCH AND CHINA CONNECTIONS AT CHARLOTTE

### *Ambassador of France at UNC Charlotte*



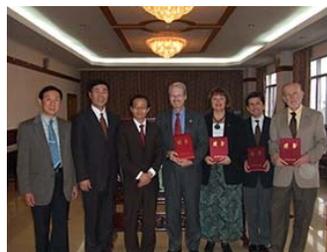
*Pierre Vimont*

The Office of International Programs (OIP) was honored by a visit from His Excellency Pierre Vimont, Ambassador of France to the United States, in April. The Ambassador met with students and made a presentation.

Ambassador Vimont was appointed to his post by President Nicolas Sarkozy in August 2007. A member of the Foreign Service since 1977, Ambassador Vimont has held various positions during his distinguished career including, Deputy Director General for the Cultural, Scientific and Technical Relations Department, Director of European Cooperation, Ambassador and permanent representative of France to the European Union from 1999 to 2002, and directly prior to his current appointment, he was chief of staff to the minister of foreign affairs.

### *UNC Charlotte begins new official partnership with Nanjing Medical University in China*

In October, Mark Clemens (Vice Chair, Biology), Jane Neese (Associate Dean, CHHS), Robert Reimer (Chair, Languages &



*(R-L) Robert Reimer, Joël Gallegos, Jane Neese and Mark Clemens from UNC Charlotte and three administrators at Nanjing Medical University*

Culture Studies), accompanied Joël Gallegos (Executive Director, OIP) to China to meet with colleagues at Nanjing Medical Univ. (NMU). While in Nanjing, the delegation met with senior NMU officials to discuss possible cooperation and exchange in biology, health, languages, and international studies. Dr. Clemens presented on BioMedical Science at UNC Charlotte and Dr. Neese presented on the CHHS programs and research. A Memorandum of Understanding was signed will foster faculty exchange, future student exchange and research cooperation. UNC Charlotte currently receives visiting faculty from NMU in the Department of Biology.

The delegation also visited Nanjing University and Fudan University in Shanghai.



## Fun at Team QUEST

The University of North Carolina at Greensboro offers an international section of the University Studies (UNS 101) class. In addition to preparing entering students to meet the demands of university life, this section focuses on the additional challenges faced by students who have recently arrived in the U.S. One important component of the class is to help the students build confidence and trust.

On a chilly Saturday morning in November, students from the international section of UNS 101 participated in the Team QUEST program at Piney Lake. Team QUEST's philosophy is based on experiential learning, with an emphasis on group trust, communication, creative thinking, problem solving, and leadership development.



*Pamela Harrod*

The students from the UNS class who participated were from the Bhutan, Saudi Arabia, and South Korea. Pamela Harrod, Director of International Admissions, who was their instructor, also participated in the day's events.

This was the second time the class had gathered at Piney Lake for a Team QUEST experience. The first time, in September, the course included team-building exercises, which progressed from fairly easy to challenging. As inhibitions subsided, group trust, problem solving and a good sense of humor took over. In an obstacle course exercise, classmates worked in pairs. One was blindfolded, the other was the guide. The guide had to give directions to the blindfolded student, who had to walk through obstacles without stepping on anything. Several techniques were used, from "go left, turn around", to "take a 40 centimeter step at a 10 degree angle to the left". All of the pairs succeeded in completing the task and were happy with their accomplishments.

The group faced a greater (and higher) challenge when they returned to Piney Lake in November for the Team QUEST Expedition course – 40 feet in the air!

No one was forced to participate in the day's activities. Indeed, some students had second thoughts once they realized how high 40 feet feels looking down. Nevertheless, everyone forged ahead to solve the challenges of getting from one section of the course to the next by balancing on thin wires. At times, it appeared that the expectations were not possible. Fear, frustration, some laughter, and much perseverance helped them to conquer the tests. The one crucial factor in their success was TRUST in one another.

The most fun activity was exiting the course – a flight down a hydraulic zip line to the safety of the ground. At the end of the day, everyone was amazed with what they had accomplished. Even the most fearful asked if they could come again.



**Farewell to Dr. Lyn Lawrance.**  
**Dr. Lawrance has been at UNC Greensboro for over 20 years serving as Associate Provost for International Programs since 2003. In January this year she announced her intention to retire and return to her native Australia. The entire UNC international community will miss her great leadership and wishes her well. "No Worries Mate!"**



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

## SAVING AN ECOLOGICAL WONDERLAND

For most of its existence, the Galapagos Islands of Ecuador have remained the untouched sanctuary of some of the most unique plant and animal species on the planet. However, with the arrival of migrants from the mainland of Ecuador and international tourist, this fragile and charismatic place has been disrupted. Central among the ecological challenges are the prevalence of invasive flora and fauna that threaten the native and endemic plants and animals, the direct and indirect effects of population migration to the islands, and the conflicts between resource conservation and economic development. Through collaborations with scientists at the Universidad San Francisco de Quito (USFQ), the Galapagos National Park, and the Charles Darwin Research Station, UNC-Chapel Hill is leading a set of new research initiatives that examine the complex interplay among population, health, and environment in the Galapagos archipelago.

To focus world attention on this World Heritage Site, UNESCO has recently declared an "at risk" status for the Galapagos Islands and the Ecuadorian government has similarly declared an "ecological emergency," because of the increased pressure of human settlement and economic development in the islands. These declarations have served to highlight the relevance of the Galapagos Initiatives being developed at UNC-Chapel Hill that emphasizes an integrative and interdisciplinary research perspective that cuts broadly across the academic, health, and professional units on campus. The focus is on the social and ecological sensitivity and resilience of this world renowned ecosystem, made famous by Charles Darwin and evidenced by the adaptations in the islands' Giant Tortoises, Marine Iguanas, and Darwin Finches.

In 2006, Steve Walsh, Professor of Geography and Fellow at the Carolina Population Center and Carlos Mena, former PhD student in the UNC Department of Geography and now at

USFQ, were invited to the Galapagos Islands by The Nature Conservancy, the Galápagos National Park, the Charles Darwin Research Station, and CLIRSEN, the Ecuadorian government agency responsible for land use studies and remote sensing, to conduct research on the mapping of invasive plant species from satellites. Since then, Walsh and Mena have traveled to the Islands many times to meet with Park and Station personnel and to gather preliminary data to support initial studies on the interactions of the social, terrestrial, and marine subsystems in the Galapagos Islands, and to engage Carolina faculty and students through a Galapagos Working Group that fosters integrative and interdisciplinary research.



Steve Walsh

"As a broad, comprehensive research university, UNC brings tremendous assets to the problems facing the Galápagos Islands," said Walsh. As the cornerstone of a much larger effort to integrate research and education using the Galapagos Islands as a "living laboratory," the Galapagos Initiatives being developed by Walsh and Mena create a network of scholars and institutions for long-term collaboration, advances theories and practices in the study of dynamic and coupled human-natural systems, and addresses the often competing agendas of resource conservation versus economic development as a global template. The goal is to engage faculty and students from across the sciences to address critical population, health, and environment questions that have important scientific value as well as societal relevance. The intent is for UNC-Chapel Hill to shape and be shaped by this international connection with the Galapagos Islands, a place of incredible challenge and opportunity.