



your
HEALTH



your
COMMUNITY



your
WORLD

Changing the way we live
**RESEARCH
& TREATMENT**

AT HAMPTON UNIVERSITY

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RESEARCH & TREATMENT

AT HAMPTON UNIVERSITY



For over 139 years, Hampton University has held true to its mission — educating students to be scholars and leaders locally, nationally and internationally. Today this institution has evolved into a 21st century university that educates students to harness and utilize the power and potential of technology and cutting-edge research. Hampton University scientists, professors and students are currently involved in research that will have a direct impact on your health, your community and your world.

From research on Alzheimer's disease to studies that will ease transportation problems, Hampton University is investigating issues that affect us all. We have taken an interdisciplinary approach to the treatment and research of cancer. The University has also established itself as a leader in particle and nuclear physics. Our Center for Atmospheric Sciences is part of a team that is launching satellites that will improve scientists' understanding of global warming and hurricanes.

Few other universities of our size can offer comparable research facilities, research partnerships and student and faculty-initiated research projects. I encourage you to learn more about Hampton's research as we seek to answer fundamental questions about diseases, social problems and the universe.

A handwritten signature in black ink, reading "W. R. Harvey". The signature is written in a cursive style with a long, sweeping underline.

Dr. William R. Harvey
President, Hampton University

your HEALTH



Nursing students research health disparities.

Hampton University is devoted to finding ways to ease human suffering and save lives. Research is being conducted on common illnesses that plague Americans. The University is dedicated to reducing health disparities of racial and ethnic minorities through research, community programs and partnerships. Minorities experience serious disparities in treatment and outcomes of infant mortality, cancer screening and management, cardiovascular disease, diabetes, HIV infection/AIDS and immunizations.

CONQUERING HEALTH DISPARITIES

The School of Nursing's community programs empower citizens with free literature on health care in the Hampton Roads area. In collaboration with the Peninsula Institute for Community Health (PICH), the School of Nursing provides free health screenings, first aid, and health education for the homeless on the Virginia Peninsula. Both the Hampton University Center for Minority Family Health and the Center for Health Disparity Reduction are funded by the National Institutes of Health.



School of Pharmacy researchers Dr. Chengan Du and Corinne Ramaley

DIAGNOSING ALZHEIMER'S DISEASE WITH A BLOOD TEST

The School of Pharmacy is conducting research on drugs to tackle breast cancer and diabetes. Black women have a higher breast cancer mortality rate than any other racial or ethnic group and blacks are two times more likely to be diagnosed with type-two diabetes than whites.

Alzheimer's disease is the most prevalent neurodegenerative disease of aging in the United States. Professors in the School of Pharmacy are also conducting research to develop a blood test that will enable doctors to diagnose Alzheimer's disease at an earlier stage.

UNDERSTANDING THE LONG-TERM EFFECTS OF BRAIN INJURIES

Dr. Irene Barrow, associate professor in the Department of Communicative Sciences and Disorders and a speech pathologist, conducted a study that demonstrates the distraction that pop music may have on patients who have suffered brain injuries. In this study, a voice-activated computer program, designed by Barrow, monitored patients' response times when they were asked to identify common items such as animals, places, and instruments. The program measured speed and accuracy of the patients' responses. To test the ability of the patients to perform with a distraction, pop music was played in the background. Patients' performance was slower and less accurate with the presence of the pop music distraction. Barrow said that patients had a tendency to dance and sing along with the music and lose focus on the activity. Barrow co-authored the study with Dr. L.D. Britt, chief of surgery at Eastern Virginia Medical School (EVMS), and Dr. Jay Collins, surgeon at EVMS.



Dr. Irene Barrow

TAKING A LEAD IN CANCER TREATMENT AND RESEARCH

Cancer is one of the leading causes of death for Americans and African Americans suffer disproportionately from many forms of cancer. Hampton University has taken a leading role in the research and treatment of this disease. In October 2005, the University received final approval from the commissioner of health of the Commonwealth of Virginia to begin the construction of a proton beam therapy center. This project will bring state-of-the-art cancer treatment to Virginia and the Mid-Atlantic region.

THE TREATMENT

Proton beam therapy is a type of radiation that can precisely target tumors while sparing surrounding tissue and causing far fewer side effects than traditional radiation. Currently there are only five other proton beam therapy centers operating in the country located at Indiana University; Loma Linda Medical Center in Southern California, Massachusetts General Hospital in Boston, University of Florida and University of Texas.

The city of Hampton has donated six acres of land off Magruder Boulevard to Hampton University to construct the proton beam therapy center. Construction of the \$200 million Center will take 36 months to build.

The center will treat about 2,000 patients a year and will focus primarily on prostate cancer but will also treat patients with breast, lung, eye and pediatric cancers.

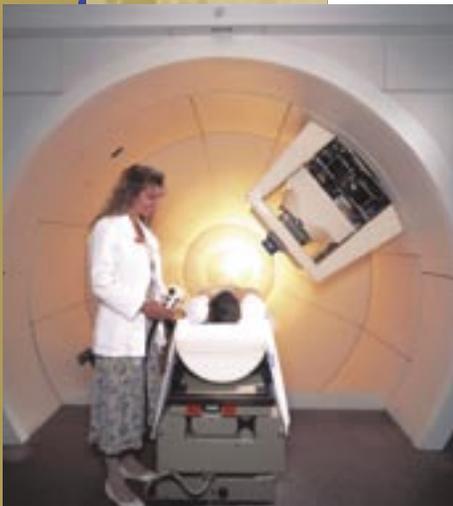
Traditional radiation treatments often destroy healthy tissue; therefore, doctors have to limit the dose. The proton beam delivers a low dose of therapy as it enters the body, increases as it reaches the cancerous tumor, and drops as it leaves the body.

THE RESEARCH

The University will construct a 21,000 square-foot research center. Funded by Hampton University and a federal government agency, the state-of-the-art facility will be an interdisciplinary center for biomedical researchers from both Hampton University and the local region.

The center will become the only campus institute specializing in the research of breast, prostate, and other cancers that disproportionately affect minorities. While more than 200,000 women will be diagnosed this year with breast cancer, 40,000 of them will lose their battle with the disease. In addition, black women are 33 percent more likely to die from breast cancer than any other ethnic group. Meanwhile, African-American men are one and a half times more likely than white men to suffer from prostate cancer, the most common cancer in men in the United States.

This research center will serve as an interdisciplinary facility that will attract scientists from all over the world. The building will house the existing HU Center for Advanced Medical Instrumentation. Devices developed by this center have been successfully used for breast cancer localization and treatment in clinical trials. HU's graduate medical physics program will also take home in the center. This program is the first in the state and the only program of its kind at a historically black college and university.



A patient receives proton beam therapy.



Dr. Cynthia Keppel developed a surgical device, used to detect small cancer lesions.

your COMMUNITY



Dr. Zina McGee speaks with a student researcher.

Your community is your home, and that is why Hampton University is diligently working to improve and make a difference in your community by studying the social issues around us.

DISCOVERING THE EFFECTS OF VIOLENCE

Each year approximately five percent of the nation's population are victims of a crime. Hampton University researchers are examining the behavioral and emotional after-effects of adult victims of crime, gaining a better understanding of the supportive assistance needed for these victims. Research is also underway to develop prevention, intervention and treatment strategies for at-risk youth likely to be influenced by area criminal activity.

Dr. Zina McGee, professor of sociology, is exploring the impact on mental health and development of children residing in chronically violent neighborhoods located in Hampton, Portsmouth, Newport News, Norfolk, and Virginia Beach. Her continued research aims to discover the linkages between risk factors and patterns of coping among youth residing in high-stress settings. According to McGee, the majority of the studies that have addressed violence emphasize the effects of television violence on youth as opposed to real-life violent events.

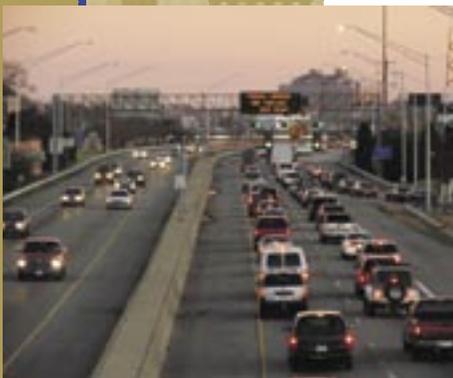
IMPROVING EMERGENCY RESPONSE TIME

In the event of a terrorist attack, natural disaster, or other emergency, the creation of a real-time information database by Hampton University's Data Conversion and Management Lab (DCML) will allow area firefighters, paramedics and police officers to respond faster and more efficiently to future emergency calls. This research database allows first responders to develop a response plan quickly before arriving at their destination by electronically accessing critical maps, building blueprints, electrical diagrams and more, ultimately saving time and lives. As more area buildings and facilities are added to the DCML database, the project's capabilities will continue to expand.



ALLEVIATING TRAFFIC CONGESTION

As Hampton Roads and other areas across the nation continue to grow, so does the volume of traffic. Hampton University's School of Business is partnering with state and city governments, local transit companies, transportation industries, and regional universities to advance U.S. technology and expertise in transportation through its Eastern Seaboard Intermodal Transportation Applications Center (ESITAC). Supported by the U.S. Department of Transportation, the ESITAC's strategic location in the Mid-Atlantic allows the center to facilitate businesses throughout the community. The ESITAC will work to alleviate the area's congestion and environmental problems as well as make Hampton University a nationally recognized leader in transportation research.



your WORLD



Hampton University researchers are working on a variety of projects that can not only help us understand the world we live in but also give insight into how we will live our lives in the future.

DISCOVERING THE ORIGIN OF THE UNIVERSE

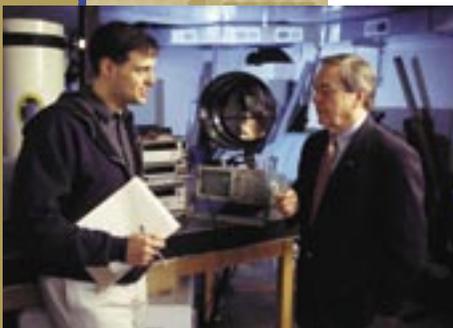
Hampton University's Center for the Study of the Origin and Structure of Matter (COSM) has established itself as a world-class leader in particle and nuclear physics research. It is one of ten Physics Frontiers Centers in the country and is the only one at an HBCU. COSM constructed parts of the Barrel Transition Radiation Tracker for the ATLAS particle physics experiment conducted by scientists from 34 nations at the CERN Laboratory in Geneva, Switzerland. In 2007, ATLAS will offer researchers a glimpse into the creation of the universe according to the Big Bang theory and may help explain the nature of dark matter and dark energy that together makes up 95 percent of the universe.

LAUNCHING SATELLITES INTO SPACE

Thanks to an innovation by a Hampton University researcher, scientists and weather forecasters could soon be better equipped to predict the path and speed of a hurricane. Dr. William L. Smith, a distinguished professor in the Center for Atmospheric Sciences in the School of Science, is currently waiting for NASA to test his Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS), a remote sensing system for satellites. Smith is the principal scientific investigator of the GIFTS project, which is managed by NASA's Langley Research Center. By measuring the changes in atmospheric temperature, water vapor, carbon monoxide, ozone, and the wind velocity from the motion of water vapor molecules and clouds, GIFTS will be able to provide researchers with the data needed to forecast a hurricane, including when and where it will land. Currently, 24-hour forecasts concerning a hurricane's landfall are unreliable and can be made within about 100 miles, but eventually, thanks to GIFTS, predictions would be more reliable with improved accuracy.



HU researchers from the Center for Atmospheric Sciences also are part of a team that launched a NASA satellite in April 2006 whose data will improve scientists' understanding of the global climate, hurricanes and temperature changes. Dr. M. Patrick McCormick, co-director of Center for Atmospheric Sciences, is the co-principal investigator for the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) project. CALIPSO emits laser light pulses into the atmosphere below the satellite as it orbits Earth and 'paints' a world-wide picture of the vertical extent of clouds and tiny particles called aerosols. This information helps accurately predict future climate and increase scientists' knowledge of the earth's climate. Data from CALIPSO is also providing the science community with key parts to the puzzle on how our global climate changes.



Dr. M. Patrick McCormick (right) speaks with a graduate student in the lab.



REDUCING GLOBAL WARMING

HU launched a second satellite in partnership with NASA in April 2007 and became the first Historically Black College and University (HBCU) to have total mission responsibility for a NASA satellite mission. The principal investigator is Dr. James M. Russell, III, professor and co-director of Hampton University's Center for Atmospheric Sciences. The Aeronomy of Ice in the Mesosphere (AIM) mission is determining why polar mesospheric clouds (PMCs) form and why they vary. Polar mesospheric clouds, also called "noctilucent," or night shining, clouds, which form in the polar regions are being seen at lower latitudes than ever before, and have recently grown brighter and more frequent suggesting a connection to global change. By measuring PMCs and their environment, the connection between these clouds and the meteorology of the polar mesosphere will be better understood. In the end, this will provide the basis for study of long-term variability in the mesospheric climate and its relationship to global change.

Dr. Liang Hu, a research professor of chemical engineering in the School of Engineering and Technology, is a pioneer in the fight against global warming. Hu received a \$200,000 grant from the U.S. Department of Energy for his research on carbon dioxide capture from flue gas by phase transitional absorption. This technology could eventually reduce the cost of the capture of carbon dioxide by 80 percent, saving significant amounts of money all over the world.

Hu also received a patent for an invention that can increase the absorption rate for gases. An increase in the absorption rate means a reduction in the cost of capital investment. Although this can be applied to the capture of carbon dioxide, this innovative technology can also be used in the petroleum, energy, steel, chemical and food industries.

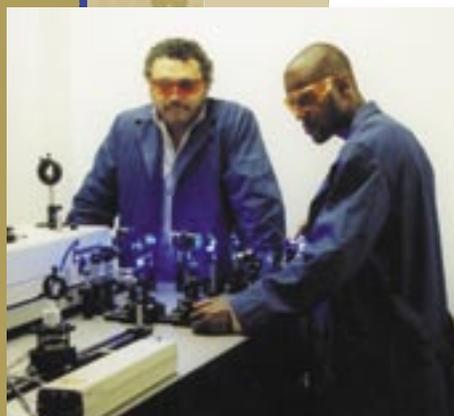
Both Hu's research on carbon dioxide absorption and his invention to increase absorption rates can go a long way towards reducing greenhouse gases around the globe by improving energy efficiency and increasing the use of non-fossil energy resources.

RE-ENGINEERING MILITARY SYSTEMS

Hampton University is one of three universities nationwide that is helping the U.S. military save valuable time and money by reverse-engineering parts from legacy military systems. The Data Conversion & Management Laboratory's Virtual Parts and Engineering Research Center recently received \$2.3 million in government funding for virtual parts engineering. It has also established a virtual engineering pilot production environment critical to the development of parts that must be reverse engineered or redesigned when original technical data is incomplete or no longer available.

DEVELOPING NEW DATA STORAGE

Dr. Doyle Temple, a professor of physics in the School of Science, was awarded a patent on an invention that could usher in the next wave of data storage. In April 2005, he received a patent for a "Cylindrical Medium for Storing Holographic Data and Methods and Apparatus for Manipulating Data Using the Cylindrical Medium," a device that stores information in the form of holograms. This unique technology has the potential to store 5,000 to 6,000 CD's worth of information in a volume of material the size of a sugar cube.



Dr. Doyle Temple (left) and student Mike Fields utilize light to develop new methods of data storage.

HAMPTON

U N I V E R S I T Y

Produced by the Office of University Relations.

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