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## I. FOREWORD

Compared to last year, enrollment in physics classes held steady while the number of students receiving physics degrees climbed to its highest level in six years. Moreover, research productivity is up (measured by faculty publications in peer-reviewed journals and presentations made to professional audiences), research opportunities for undergraduates continue to expand, and several new efforts are underway to bolster the number of students electing the physics major.

Perhaps the most ambitious of the new ventures is interdisciplinary, a joint five-year degree program between the UNCW Physics Department and the Department of Electrical Engineering at North Carolina State University. Students completing the program will earn two Bachelor of Science degrees, one in physics from UNCW and another in electrical engineering from NCSU. The UNCW phase of study would be completed in three years. Students meeting NCSU's transfer admission requirements are then automatically admitted into the Electrical Engineering Program at NCSU, where they complete the final two years of study. The Physics / ECE combination is attractive in the marketplace, where a strong command of physics principles coupled with practical engineering training is well-suited to developing novel electronic device components that will fuel future technological advances in our society. Approvals for this joint venture are all but complete, and we hope to see the new program in place early in Fall 2006.

Continuing the interdisciplinary theme, we welcome into our midst new faculty member Professor John Morrison, who officially began his tenure at UNCW with the Spring 2006 term. Though a full-time member of the Physics Department, Dr. Morrison's office and laboratory are located at the UNCW Center for Marine Science. Prior to joining the UNCW family, Dr. Morrison was Professor of Marine, Earth and Atmospheric Sciences at North Carolina State University. Much of John's time and creative energy is devoted to the Galapagos Ocean Lab (GOL) initiative, a carryover project from his days at NCSU. GOL is a comprehensive effort focused on understanding the natural and human-induced variability in the ocean and how these changes affect the biodiversity of the Galapagos Archipelago. We are hopeful this will evolve into another excellent research opportunity for our undergraduate majors. John has also begun developing a new Marine Physics Track in the hopes of enticing a broader range of students to the physics major.

Sadly, this year we have had to say goodbye to Physics Secretary Frances Brown after nine years of dedicated service to the Department. Frances officially retired from UNCW in December 2005 to join her daughter and grandchildren in Sumter, SC. We will certainly miss her smiling face and good cheer. She has been replaced by Ms. Bonnie Mattis, formerly with UNCW Student Health Services. Bonnie is off to a great start, and has proven to be quite capable in her own right.

And lastly, visitors to the Physics Department web site (<http://www.uncw.edu/phy>) will note that it has undergone a major overhaul. The result is a 'look and feel' consistent with other UNCW campus units, improved navigation, and a much-enlarged content base. Like all good sites, it remains a work in progress; we hope everyone will browse the site and provide feedback—good and bad—so that we may continue to improve the experience of our friends in cyberspace.

Curt A. Moyer  
July, 2006

## II. ORGANIZATION

### A. Staff

Bonnie L. Mattis, Department Secretary

#### Professors

Moorad Alexanian	Ph.D. Indiana University, 1964
Brian F. Davis	Ph.D. North Carolina State University, 1982
John M. Morrison	Ph.D. Texas A&M University, 1977
Marvin K. Moss	Ph.D. North Carolina State University, 1961
Curt A. Moyer	Ph.D. State University of New York at Stony Brook, 1971
Edward A. Olszewski, Jr.	Ph.D. University of North Carolina at Chapel Hill, 1976

#### Associate Professors

Frederick M. Bingham	Ph.D. University of California, San Diego, 1990
Timothy C. Black	Ph.D. University of North Carolina at Chapel Hill, 1995

#### Assistant Professors

Liping Gan	Ph.D. University of Manitoba, Winnipeg, Canada, 1998
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### B. Departmental Committees for 2005-2006

#### Lab Development Committee

L. Gan, chairperson  
T. Black  
B. Davis  
E. Olszewski

#### Undergraduate Committee

C. Moyer, chairperson  
F. Bingham  
L. Gan  
M. Moss

#### Colloquium Coordinator

M. Alexanian

#### Library Representative

F. Bingham

#### SPS | Sigma Pi Sigma Advisor

T. Black  
C. Moyer

#### Computing Resources Coordinator

E. Olszewski

#### Faculty Senate Representative

T. Black

#### CTE Liaison

F. Bingham

#### Academic Advising

M. Alexanian  
B. Davis

### III. FACULTY

#### A. Areas of Specialization

##### 1. Atomic Physics

Charge exchange in atomic collisions; response of atoms to intense electromagnetic fields; atomic structure studies; autoionization.

Professors Alexanian, Davis, Moyer

##### 2. Marine Sciences

Physical oceanography; general ocean circulation; air-sea interaction and climate; global distributions of sea surface salinity; ocean observing systems.

Professors Bingham, Morrison, Moss

##### 3. Nuclear and Particle Physics

Low energy few-nucleon systems; hypernuclear physics; quantum chromodynamics; string theory.

Professors Black, Gan, Olszewski

##### 4. Physics Education

Multimedia-based techniques for teaching introductory physics; general physics pedagogy.

Professors Black, Moyer

#### B. Honors and Awards

1. **Professor John Morrison** currently chairs the Duke/UNC Oceanographic Consortium Policy Board.

#### C. Grants and Gifts (awarded 2005-2006)

Agency and Investigators	Title / Subject	Amount
National Science Foundation <b>Timothy Black</b> (with 2 project co-PI's)	<i>"Neutron Interferometry and Neutron Schrodinger Wave Optics"</i> (continuing grant)	\$110,873
National Science Foundation <b>Liping Gan</b>	<i>"Test of Chiral Symmetry via the Primakoff Effect"</i>	\$183,602
National Aeronautic and Space Administration <b>John Morrison</b> (with 3 project co-PI's)	<i>"Connectivity and Upwelling Dynamics in the Galapagos Marine Reserve (GMR)"</i> (continuing grant)	\$73,663 (subcontract from NCSU)

#### D. Proposal Submissions (2005-2006)

1. **Black, T.** (with others) *"Neutron Interferometry and Neutron Schrodinger Wave Optics"* (renewal), to NSF; amount requested: \$300,000 (pending).
2. **Morrison, J.** (with L. Xie) *"Simulating the mesoscale variability of the northern Arabian sea"*, to NSF; amount requested: \$490,853 (pending).

3. **Morrison, J.** (with others) “*The LEZDiM (Lower Euphotic Zone Dinoflagellate Migration) Niche: Field Characterization*”, to NSF; amount requested \$1,300,891 (pending).
4. **Morrison, J.** (with others) “*IGERT International Traineeships in Climate Informatics*”, to NSF; amount requested \$3,069,041 (pending).

## E. Publications

1. **Alexanian, M.** “*Gaussian cloning of coherent states with known phases*”, Phys. Rev. **A73**:045801 (2006).
2. **Black, T.** (with D.S. Hussey, et. al.) “*Polarized  $^3\text{He}$  gas compression system using metastability-exchange optical pumping*”, Rev. Sci. Instrum. **76**, 053503 (2005).
3. **Black, T.** (with M. Amerian, et. al.) “*Measurement of the Generalized Forward Spin Polarizabilities of the Neutron*”, Phys. Rev. Lett. **93**, 152301 (2004) [not reported previously].
4. **Gan, L.** (with F. Dohrmann, et. al.), “*Electroproduction of strangeness on ( $\Lambda$ )H-3,4 bound states on helium*”, AIP Conf. Proc. **768**, 294 (2005).
5. **Gan, L.** (with T. Petkovic, et. al.), “*High-resolution kaon spectrometer (HKS) for medium-heavy mass  $\Lambda$ -hypernuclear structure studies at JLab*”, AIP Conf. Proc. **768**, 305 (2005).
6. **Gan, L.** (with S.N. Nakamura, et. al.) “*Future hypernuclear program at JLab Hall C*”, Nucl. Phys. **A764**, 421, (2005).
7. **Gan, L.** (with L. Yuan, et. al.), “*Hypernuclear spectroscopy using the ( $e, e'K^+$ ) reaction*”, Phys. Rev. **C73**:044607 (2006).
8. **Gan, L.** (with G. MacLachlan, et. al.) “*The ratio of proton electromagnetic form factors via recoil polarimetry at  $Q^2 = 1.13 (\text{GeV}/c)^2$* ”, Nucl. Phys. **A764**, 261, (2006).
9. **Gan, L.** (with B. Plaster, et. al.) “*Measurements of the neutron electric to magnetic form factor ratio  $G_{En}/G_{Mn}$  via the  $^2\text{H}(e, e'n)^1\text{H}$  reaction to  $Q^2 = 1.45 (\text{GeV}/c)^2$* ”, Phys. Rev. **C73**:025205 (2006).
10. **Gan, L.** (with M. Battaglieri, et. al.) “*Search for  $\Theta^+(1540)$  Pentaquark in High-Statistics Measurement of  $\gamma_p \rightarrow K^0 K^+ n$  at CLAS*”, Phys. Rev. Lett. **96**, 042001 (2006).
11. **Morrison, J.** (with L. Xie, et. al.) “*Climatology and Interannual Variability of North Atlantic Hurricane Tracks*”, Journal of Climate (in press).
12. **Moyer, C.** “*Numerical Solution of the Stationary State Schrödinger Equation Using Transparent Boundary Conditions*”, Computing in Science & Eng. **8**, 32 (2006).

13. **Olszewski, E.** “*From baking a cake to solving the diffusion equation*”, *Am. J. Phys.* **74**, 502 (2006).

## **F. Professional Talks Presented and Meetings Attended**

### Contributed Talks (including Poster Presentations as noted)

1. **Bingham, F.** “*Integrating Physics and History in a First Year Learning Community*” (with P. Townend and C. Stack), poster presentation for Integrative Learning: Creating Opportunities to Connect, American Association of Colleges and Universities, Denver, CO, Oct. 20, 2005.
2. **Bingham, F.** “*M2 Barotropic Tidal Currents in Onslow Bay, NC Measured by ADCP*” (with C. Canaday, H. Seim and R. Herman); “*The Coastal Ocean Research and Monitoring Program (CORMP): a User-Driven Sub-Regional Ocean Observation System in Southeastern North Carolina*”, poster presentations at the Ocean Sciences Meeting, Honolulu HI, Feb. 20-24, 2006.
3. **Bingham, F.** “*Distributions of mixed layer properties in North Pacific water mass formation areas: comparison of Argo floats and World Ocean Atlas 2001*” (with T. Suga), poster displayed at the Argo Second Science Workshop, Venice, Italy, March 15-18, 2006, the CLIVAR Salinity Workshop, Woods Hole, MA, May 8-10, 2006, and the Aquarius/SAC-D Science Workshop, Woods Hole, MA, May 10-12, 2006.
4. **Bingham, F.** “*Distributions of mixed layer properties in North Pacific water mass formation areas: comparison of Argo floats and World Ocean Atlas 2001*” (with T. Suga), presentation to the Aquarius/SAC-D Science Workshop, Woods Hole, MA, May 10-12, 2006.
5. **Morrison, J.** “*Changing seasons for the Galapagos Marine Reserve*” (with others), poster presentation to the Ocean Color Research Team, Newport, RI, Apr. 11-15, 2006.
6. **Moss, M.** “*Physics to fish: I. Integrating physical and ecological observations in the coastal ocean*” (with other CORMP investigators); “*Physics to fish: II. Using coastal ocean observations to identify ecosystem conditions, responses, and linkages*” (with other CORMP investigators), oral presentations given at the American Society of Limnology and Oceanography Summer Meeting, Santiago de Compostela, Spain, Jun. 23, 2005.

### Invited Presentations

7. **Bingham, F.** “*Coastal Ocean Monitoring in North Carolina, USA*”, seminar given at the 18th Seminar on Material Changes in the Ocean, Kawatabi, Japan Oct. 20-22, 2005.
8. **Bingham, F.** “*Monitoring M2 Barotropic Tidal Ellipse Parameters on the North Carolina Continental Shelf*” (with C. Canady), seminar presented to Tohoku University Department of Geophysics, Oct. 18, 2005.
9. **Bingham, F.** “*Coastal Ocean Response to the Passage of Hurricane Isabel*”, seminar presented to Tohoku University Department of Geophysics, Nov. 21, 2005.

10. **Bingham, F.** “*Coastal Ocean Response to the Passage of Hurricane Isabel*”, seminar presented to UNCW Department of Physics and Physical Oceanography, Mar. 24, 2006.
11. **Black, T.** “*The Neutron-Nucleus Scattering Length Puzzle*”, presentation to the Workshop on the Future of Nuclear Physics at LANCE LANL, Los Alamos, NM, Jul. 28-29, 2005.
12. **Gan, L.** “*PRIMEX Experiment*”, presentation to the Workshop on Frontiers of Nuclear Physics in the 21<sup>st</sup> Century, Jul. 22-25, 2005, Peking University, Beijing, China.
13. **Gan, L.** “*Test of QCD Symmetries at Low Energy*”, colloquium delivered to the China Institute of Atomic Energy, Jul. 28, 2005, Beijing, China.
14. **Gan, L.** “*Test of Chiral Symmetries via the Primakoff Effect*”, colloquium delivered to the Chinese High Energy Institute, Jul.26, 2005, Beijing, China.
15. **Gan, L.** “*Radiative Corrections to the Electron Compton Scattering Cross Section*”, presentation made to the PrimEx Collaboration Meeting, Mar. 18, 2006, Newport News, VA.
16. **Morrison, J.** “*Galapagos Ocean Lab*”, seminar presented as part of the Planet Ocean Seminar Series, May 9, 2006, Wilmington, NC.
17. **Moss, M.** “*Coastal Ocean Research and Monitoring Program*”, presentations to NOAA staff in Ashville, NC, to NOAA Headquarters and senatorial staffs in Washington, DC, to the Governor’s Advisory Committee meeting at East Carolina University, and to the UNCW Chancellor and Provost.

Other Meetings Attended (Professional Development)

1. **Bingham, F.** attended the conference on Data Sharing and Data Quality of Ocean Currents and Temperature: Towards an Operational Data Management System for the Southeast Region, Chapel Hill, NC, March 9-10, 2006.
2. **Bingham, F.** attended the Coastal Ecosystem Conference, Wrightsville Beach, NC, Mar. 20-21, 2006.
3. **Bingham, F.** attended CTE Workshops “*Teaching Controversial Issues*”, Feb. 9, 2006, and “*Podcasting*”, Mar. 29, 2006.
4. **Gan, L.** attended the Jefferson Lab Annual Users’ Meeting, Newport News, VA, Jun. 11-13, 2005, and participated in weekly PrimEx collaboration group telephone conferences.
5. **Gan, L.** attended the APS April Meeting and the APS Professional Skills Development Workshop, Dallas, TX, Apr. 22-25, 2006.
6. **Gan, L.** attended CTE Workshops “*What works to make student work: increasing student motivation*”, Sep. 28, 2005, and “*Managing the herd redux: large classroom management*”, Nov. 2, 2005.

7. **Gan, L.** attended the UNCW workshop “*Academic student learning outcome assessment*”, Nov. 14, 2005.
8. **Morrison, J.** attended the SE Coastal Ecosystem Workshop, Wrightsville Beach, NC, Mar. 19-22, 2006.
9. **Morrison, J.** attended the NSF Orion Meeting, Salt Lake City, UT, Mar. 27-30, 2006.
10. **Morrison, J.** attended and chaired a session at the Joint Sub commission on Ocean Research and Technology Meeting, Denver, CO, Apr. 18-21, 2006.

## G. Service

Especially noteworthy examples of service to the profession and the community for the 2005-2006 academic year include:

1. Professor **Moorad Alexanian** has reviewed manuscripts for the journals *Physical Review* (5), and *Physical Review Letters* (1), and serves on the UNCW Investigating Panel as a standby member on call by the Chancellor.
2. Professor **Moorad Alexanian** supervised three student seminar (PHY 495) projects: “*Quantum cryptography: Using quantum theory to protect the privacy of information sharing*” with Camilo Alvarez; “*Space weather and its effects on spacecrafts*” with William Zinicola; “*Optical computers: How they work*” with Erin Raphael.
3. Professor **Moorad Alexanian** contributed the piece “*Set Theoretic Analysis of the Whole of Reality*”, as a Letter to the editor of *Perspectives on Science and Christian Faith* (in press).
4. Professor **Fred Bingham** is the graduate advisor for Marine Science Masters student Chris Canady. He also serves on the Masters in Marine Policy Planning Committee, a collaboration between the Center for Marine Science and the Cameron School of Business, and UNCW’s Career Services Counselor Search Committee.
5. Professor **Fred Bingham** is Executive Committee member and webmaster for the American Geophysical Union Ocean Sciences Section ([www.agu.org/sections/oceans/](http://www.agu.org/sections/oceans/)). He is also involved in developing and maintaining the CORMP website ([www.cormp.org](http://www.cormp.org)).
6. Professor **Fred Bingham** has reviewed proposals to NSF (2) as well as manuscripts (1 each) to *Geophysical Research Letters* and *The Physics Teacher*.
7. Professor **Fred Bingham** coached the Science Olympiad team from the Wilmington Academy of Arts and Sciences. [The team placed first in the regional competition held at UNCW on Mar. 18, 2006.]
8. Professor **Timothy Black** supervised one student seminar (PHY 495) project: “*Propulsion Systems*” with Adam Foushee.

9. Professor **Brian Davis** represented the Physics Department at the College of Arts and Science's 4<sup>th</sup> Annual College Day event (Nov. 12, 2005), where he presented a lecture titled "*How High the Moon? The Culmination of the Moon's 18.61 Year Cycle*". He also gave a presentation titled "*Sidereal Time: The Key to Understanding the Sky*" to the UNCW Lifelong Learning Society, Oct. 28, 2005, and another on *Regression of the Lunar Nodes Cycle* to the Cape Fear Astronomical Society, Oct. 2, 2005.
10. Professor **Brian Davis** participated in *Interact 2006, Information Technology's Interact Technology Showcase*, Mar. 29, 2006, where he presented a slide show detailing his research on solar interactions with petroglyphs.
11. Professor **Brian Davis** was an event leader for this year's Science Olympiad, held Mar. 18, 2006. He administered the *Reach for the Stars* competition (middle school level) and the *Astronomy* competition (high school level).
12. Professor **Liping Gan** served on the organizing committee for the International Workshop on Strangeness Nuclear Physics (SNP2006) to be held Sep. 5-9, 2006, Zhang Jia Jie City, China. She is also a member of the Advisory Board to CSURF (Center for the Support of Undergraduate Research and Fellowship), and is involved in building an overseas Asian Studies program at UNCW.
13. Professor **John Morrison** is a member of various national and regional research organizations, including the Ocean Color Research Team, the NASA Biodiversity Research Team, the PORSEC Scientific Organizing Committee, and UNOLS Regional Class Advisory Committee. He serves on the Executive Committees of the International Pan Ocean Remote Sensing Conferences Committee, the Southeast Coastal Ocean Observing System (SECOOS) Planning Committee, and SURA's Southeastern Coastal Ocean Observing Program (SCOOP).
14. Professor **John Morrison** is an active participant in the *Southeast Center for Excellence in Ocean Science Education* (<http://www.scseagrant.org/se-cosee/>), an effort to enhance ocean-learning opportunities for all age levels by incorporating the work of researchers into high-quality educational products. He is also involved with the *Career Clusters Program* (<http://careerclusters.org>) as a member the national team to develop the Science, Technology, Engineering and Mathematics (STEM) cluster, and he is a member of the *Project Lead the Way* (<http://www.pltw.org>) State Leadership Team for North Carolina, an organization devoted to preparing students for college engineering programs.
15. Professor **Marvin Moss** serves on the Board of Directors of the North Carolina Biotechnology Center in the Research Triangle Park, where he was active in promoting and securing funds for a district office in Wilmington (Southeastern Office of the NCBC). He is also a member of the Board's subcommittee on Science, Education and Technology.
16. Professor **Marvin Moss** serves on the Board of the Health Sciences Foundation (formerly Coastal Area Health and Education Center), a major medical center working at and in association with the New Hanover Regional Medical Center.

17. Professor **Marvin Moss** continues to consult with the Camp Lejeune Marine Base in Jacksonville, NC on environmental problems. His efforts have lead to a Federal Strategic Environmental R&D Program commitment totaling \$20M over 10 years to address environmental issues at Camp Lejeune.
18. Professor **Curt Moyer** served as a judge for the Science Fair held at the MCS Noble Middle School, Jan. 10, 2006.
19. Professor **Edward Olszewski** contributed the piece "*What is Physics?*" to the April 2006 issue of the Physics Department Newsletter.

#### IV. ACADEMIC ENRICHMENT & SUPPORT PROGRAMS

##### A. Course Offerings and Enrollments

<b>Summer 2005</b>	<b>Instructor</b>	<b>Enrollment</b>
PHY 101 Elementary College Physics	Herman, R.	67
PHY 102 Elementary College Physics	Olszewski, E.	54
PHY 201 General Physics	Olszewski, E.	40
PHY 202 General Physics	Black, T.	15
<b>Fall 2005</b>		
PHY 101 Elementary College Physics	Olszewski, E.	75
PHY 101 Elementary College Physics	Olszewski, E.	75
PHY 101 Elementary College Physics	Gan, L.	73
PHY 103 Great Ideas in Physics	Alexanian, M.	34
PHY 105 Introductory Physics	Black, T.	28
PHY 201 General Physics	Moyer, C.	27
PHY 201 General Physics	Black, T.	45
PHY 201 General Physics-Honors	Black, T.	5
PHY 260 Introduction to Astronomy	Davis, B.	71
PHY 311 Mathematical Physics	Herman, R.	8
PHY 321 Mechanics	Davis, B.	8
PHY 335 Modern Physics	Gan, L.	9
PHY 400 Advanced Lab	Black, T.	6
PHY 411 Electricity & Magnetism	Alexanian, M.	5
PHY 415 Solid State Physics	Moyer, C.	1
PHY 444 Quantum Theory	Moyer, C.	9
PHY 495 Physics Seminar	Davis, B.	1
PHY 495 Physics Seminar	Gan, L.	1
PHY 495 Physics Seminar	Alexanian, M.	1
PHY 495 Physics Seminar	Black, T.	1
PHY 592 Special Topics (MatLab)	Snedden, G.	6
<b>Spring 2006</b>		
PHY 102 Elementary College Physics	Olszewski, E.	75
PHY 102 Elementary College Physics	Olszewski, E.	81
PHY 102 Elementary College Physics	Gan, L.	34
PHY 105 Introductory Physics	Bingham, F.	9
PHY 111 Archaeoastronomy	Davis, B.	46
PHY 202 General Physics	Moyer, C.	15
PHY 202 General Physics	Black, T.	22
PHY 202 General Physics-Honors	Black, T.	4

PHY 260 Introduction to Astronomy	Davis, B.	60
PHY 300 Analog Circuits	Black, T.	5
PHY 322 Classical Dynamics II	Moss, M.	4
PHY 412 Electricity & Magnetism II	Alexanian, M.	6
PHY 445 Optics	Alexanian, M	3
PHY 455 Thermal Physics	Gan, L.	3
PHY 475 Physical Oceanography	Morrison, J	4
PHY 490 Introduction to General Relativity	Herman, R	8
PHY 491 Directed Individual Study	Davis, B	1
PHY 495 Physics Seminar	Herman, R	2
PHY 495 Physics Seminar	Alexanian, M	2
PHY 575 Physical Oceanography	Morrison, J	7

## B. Innovative Teaching Initiatives

Professor **Fred Bingham** again taught PHY 105 (Introductory Physics) as part of a Learning Community (LC) with Professor Paul Townend of the History Department. The LC visited the office of a local optometrist who talked about corrective lenses, the anatomy and diseases of the eye, and LASIK surgery (several students even had pictures taken of their retinas!). Bingham, with P. Townend and C. Stack, summarized their LC experience in a poster session of the American Association of Colleges and Universities [Denver, Oct., 2005]. The poster was titled “*Integrating Physics and History in a First Year Learning Community*”.

Professor **Timothy Black** continues to teach an Honors section of physics laboratory for the introductory calculus-based sequence PHY 201-202. He developed two new labs for PHY 202 —the use of a Wheatstone Bridge to measure capacitance and a verification of Malus’ Law— that will be improved and added to the regular “line-up” for Spring, 2007. He also created new laboratories for the Advanced Lab (PHY 400) course. One particularly successful one was a measurement of Fraunhofer diffraction, made possible by the recent department acquisition of 5 and 10  $\mu\text{m}$  slits.

## C. Research Opportunities for Undergraduates

The following research projects were active during the 2005-2006 academic year:

1. For summer 2005, three UNCW physics majors assisted Professor Liping Gan with her research at Jefferson National Laboratory (JLab) developing a low energy recoil detector for experiments testing predictions of Quantum Chromodynamics. The students were supported by research grants from NSF and Jefferson Lab. The JLab summer experience is a unique research opportunity for undergraduates that has involved eleven UNCW students since 2001. This year’s participants reported their project results to the North Carolina Undergraduate Research Symposium, North Carolina State University, Nov. 12, 2005. One student (Letisha McLaughlin) also participated in the UNCW Showcase of Undergraduate Research and Scholarship, Apr. 5-12, 2006, and was selected to present her project results to the UNCW Board of Trustees on Apr. 27, 2006.

## D. Physics Department Colloquia

Date	Speaker/Affiliation	Title
September 2	Dr. Yee Jack Ng, University of North Carolina Chapel Hill	<i>From spacetime foam to black hole computers and ark energy/matter</i>

<b>Date</b>	<b>Speaker/Affiliation</b>	<b>Title</b>
October 14	Dr. Archil Kobakhidze, University of North Carolina Chapel Hill	<i>Landscape, quantum cosmology and the cosmological constant problem</i>
October 21	Dr. Ye Wu, University of North Carolina Chapel Hill	<i>Nanotubular Materials and NMR Studies</i>
October 28	Dr. Thomas Pearl, North Carolina State University	<i>Probing surface chemical reactions, interactions, and behavior of single molecules with atomic scale tools</i>
November 4	Dr. Karen Daniels, North Carolina State University	<i>Freezing and Melting in Granular Materials</i>
November 11	Dr. Keith Weninger, North Carolina State University	<i>Membrane fusion and the entry of viruses into cells</i>
November 21	Mr. Christopher Tate, UNCW student	<i>Boron Neutron Capture Therapy: A Binary Cancer Treatment</i>
December 2	Mr. Adam Foushee, UNCW Student and Mr. Camilo Alvarez, UNCW Student	<i>Aircraft Propulsion Systems</i> <i>Quantum Cryptography: Using quantum theory to protect the privacy of information sharing</i>
February 3	Dr. Kate Scholberg, Duke University	<i>Neutrinos from the sky through the earth</i>
February 24	Dr. Russell Herman, University of North Carolina Wilmington	<i>Predicting the future of the solar system: Nonlinear dynamics, chaos and stability</i>
March 17	Dr. Patricia Turrisi, University of North Carolina Wilmington	<i>Let's Have a Big Fight about Creationism: a philosopher examines why people are compelled to argue about human origins</i>
March 24	Dr. Frederick Bingham, University of North Carolina Wilmington	<i>Coastal Ocean Response to the Passage of Hurricane Isabel</i>
March 31	Dr. Liguang Tang, Hampton University and Jefferson Lab	<i>Lambda-hypernuclear spectroscopy using <math>(e, e'K^+)</math> reaction – HKS program at JLab</i>
April 7	Dr. Mark Kruse, Duke University	<i>Particle Physics at the Energy Frontier</i>
April 20	Dr. Eugen Merzbacher, University of North Carolina Chapel Hill	<i>The Spirit of Copenhagen</i>

## E. SPS/ΣΠΣ Activities

On April 20, 2006, the UNCW chapter of Sigma Pi Sigma, the national physics honor society, admitted to membership four undergraduate students: *Mary Margaret McEachern*, *Letisha Annette McLaughlin*, *Matthew Adam Reece*, and *Diana Elisabeth Streng*. The induction ceremony followed a public lecture by Kenan Professor of Physics Emeritus Eugen Merzbacher from UNC Chapel Hill, who spoke about "*The Spirit of Copenhagen*". Refreshments (pizza and soda) were served during a social hour after the ceremony.

## V. STUDENTS

### A. Enrollment Statistics

#### Undergraduate Physics Majors

Year	Freshman (Fall)	Sophomores (Fall)	Juniors (Fall)	Seniors (Fall)	Second Majors (Fall)	Fall Total	Annual Graduates	
							B.A. Degrees	B.S. Degrees
1994-1995	0	4	9	12	N/A	25	1	4
1995-1996	1	4	7	8	N/A	20	3	3
1996-1997	0	12	5	10	N/A	27	5	6
1997-1998	0	7	11	11	1	30	5	3
1998-1999	0	3	5	15	2	25	6	3
1999-2000	0	4	1	12	1	18	3	5
2000-2001	0	4	3	6	1	14	3	2
2001-2002	0	5	2	5	2	14	2	2
2002-2003	0	2	10	4	4	20	3	1
2003-2004	0	9	5	9	1	24	3	4
2004-2005	0	6	8	8	2	22	0	4
2005-2006	1	1	4	11	1	18	1	6

### B. Degrees Awarded

December, 2005

#### *Bachelor of Science:*

Camilo Andres Alvarez  
Adam Edward Foushee

May, 2006

***Bachelor of Science:***

Louis Michael Grissom Jr.  
Erin Theresa Raphael  
Christopher Adams Tate  
William Nicholas Zinicola

***Bachelor of Arts:***

Joseph Shane Martin

**C. Honors, Awards, and Scholarships**

**Hildelisa Hernandez Departmental Award in Physics:** *Letisha Annette McLaughlin*

The Hernandez award, named for retired Professor Emeritus Hildelisa Hernandez, recognizes outstanding academic achievement of a rising senior who is seeking the B.S. degree in physics. The award carries a stipend of \$500 to help defray educational expenses incurred at UNCW.

Letisha compiled an overall GPA = 3.667. She assisted Dr. Liping Gan with nuclear physics research at the Thomas Jefferson National Laboratory in summer 2005, and has been selected to participate in the REU program at Montana State University in Bozeman, MT for summer 2006. She is also one of four undergraduates inducted into Sigma Pi Sigma for 2006. Letisha expects to graduate next spring with a minor in Mathematics.

**Walter Schmid Award:** *Camilo Andres Alvarez, William Nicholas Zinicola*

The Schmid Award is presented to a graduating senior who, in the opinion of the physics faculty, shows great potential for contributing to the fields of theoretical or applied physics. The award consists of a plaque inscribed with the winner's name, and a cash prize. In an unprecedented move, the Department presented the Walter Schmid Award twice this academic year, in December and again in May.

The December recipient, Camilo Alvarez, graduated *Summa Cum Laude* with a 3.976 GPA. Camilo also received the Chancellor's Achievement Award in each of the six semesters he spent at UNCW, and was one of just five students (and the only undergraduate) selected to represent UNCW at a two-day symposium, *A Gathering of Nobel Laureates: Science for the 21<sup>st</sup> Century*, held at UNC Charlotte on Feb. 28, 2005. Camilo plans to pursue graduate studies in Physics and was awarded a full assistantship from NCSU for the Spring '06 term.

The May award went to Bill Zinicola, who compiled an overall GPA = 3.621 and physics GPA = 3.743 (earning an 'A' in every course taken in his last term). He has worked for the department several years as a laboratory assistant, and has accepted an SPS Internship at NASA's Goddard Space Flight Center for summer 2006.

**Jefferson Lab Summer Fellowships:** *Nicolette Kosteki and Christopher Mauney*

Nicolette and Chris were selected by faculty member Professor Liping Gan to assist this summer at Jefferson Lab in developing a low energy recoil detector for experiments testing predictions of QCD (Quantum Chromodynamics). The students are supported by research grants from NSF and Jefferson Lab.

**Bookstore Scholarship Award Winners:** *Letisha Annette McLaughlin and Diana Elisabeth Streng*