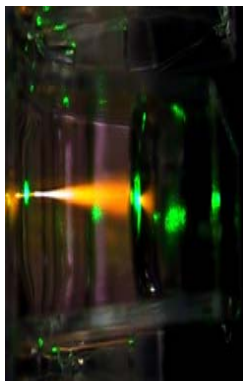


12-basepair DNA
helix with inserted
fluorescent base.
(UAB Physics Dept.)



UAB
THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
Department of Physics
1530 3rd Ave. S. (mail)
1300 University Blvd
310 Campbell Hall
Birmingham, AL 35294-1170

Introductory Courses:

Course no.	Sem hrs	Course Name
PH 221-222	8	General Physics
CH 115-118	8	General Chemistry
BY 123-124	8	Intro. Biology
MA 125-126	8	Calculus I-II

Intermediate Courses:

PH 351-352	8	Modern Physics*
CH 235-238	8	Organic Chemistry
MA 227	4	Calculus III
MA 252	3	Differential Equat.

Recommended Electives:

PH 475-476	8	Intro. Biophysics
PH 423	3	Comput. Physics.
PH 425	3	Applic. Optics I
PH 445	3	Electromagnetism I
PH 450	3	Quantum Mechanics
PH 461	3	Classical Mechanics
PH 481	3	Laser Physics I
PH 487	3	Nanoscale Science
PH 491	1-3	Adv. Physics Lab
CH 325	4	Thermo. Chem. Kin.
CH 326	4	Structure, Spectros.
CH 461	3	Biochemistry
CH 464	3	Physical Biochem.
BY 210	3	Genetics
BY 271	4	Microorganisms
BY 311	3	Molecular Genetics
BY 330	3	Cell biology
MA 260	3	Intro. Linear Algebra
MA 444	3	Vector Analysis
MA 454	3	Intermed Diff. Equat

Track Requirements: physics (29 hrs), chemistry (16 hrs), math (18 hrs), biology (8 hrs), plus additional UAB & NSM core curriculum requirements.

*Includes thermodynamics and statistical mechanics.

Contact the Physics Dept. to plan coursework.

Tel: 205-934-4736; Fax: 205-934-8042.

Visit the web site <http://www.phy.uab.edu>.

Oct.ober, 2004

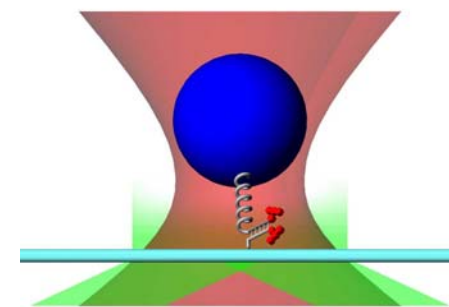
UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
Department of Physics

Biophysics Track

Physics B.S. program targeting

- Jobs at the B.S. level.
- Medical School
- Multidisciplinary High-tech
- Bio- and Health Technology
- Science Teaching & Writing
- Graduate School in
Biosciences: Biochemistry,
Molecular Biology...; Law,
Biomedical Engineering...

*A multidisciplinary
undergraduate curriculum
in physics, chemistry,
biology and mathematics.*



**Prepare for graduate
biophysical/biomedical careers.**

Example: combined optical trapping and
single molecule fluorescence for unzipping
DNA. Figure prepared by J. Ferrer from the
Lang lab at MIT. <http://web.mit.edu/~langlab/>

Biophysics & Living Things:

- Study the fundamental structures and processes of life.
- Search for the simple rules within the complexities of life.
- Transfer technology from nature to the research or manufacturing lab or clinic.

Biophysics & Medical School:

- Distinguish yourself from the many other applicants for that Medical School opening.
Physics majors are successful at entering medical school.
- Get pre-med preparation in chemistry, biology, physiology plus the physics background for modern technology.

Other Alternatives:

- Keep your options open for graduate study and research in biophysics, biochemistry, biology, medicine and interdisciplinary fields.
- High-tech industry: biotech, nanotech, laser & optical, environmental...
- Teach high school physics, chemistry, biology, mathematics. *Every state needs Physics, Math, Chemistry & Biology teachers.*
- Science writing: news, magazine, editing, legal/political advising... *There are jobs now: e.g., Journal of Undergraduate Research.*
- Law, patents. *Multidisciplinary science provides a great background for the practice of law in the new-technology arena.*

Why UAB for Biophysics?

- Balance of coursework.
- Undergraduate research involvement.
- Experience in a world-class medical center on campus.
- The region's best combination of physical, chemical, biochemical and medical education and research.

Physics Preparation for Medicine.

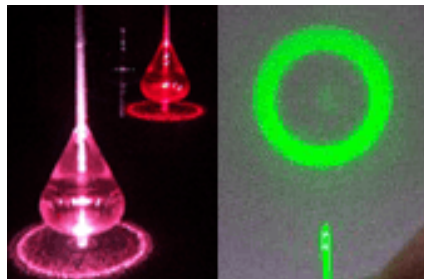
Magnetic Resonance Imaging. Invented by a physicist, MRI and x-ray CAT are based on principles learned in Physics courses.

Positron Emission Tomography. PET images brain activity via decay of radioactive tracers in the bloodstream.



Ultrasound. Images tissue and organs inside the body using ultrasonic waves.

Lasers and Optics in Medicine. Laser light, introduced through fiber optic devices is widely used for eye, heart and many other surgeries. Inexpensive optical devices play prominent roles even in local clinics. Learn about them in Physics courses.



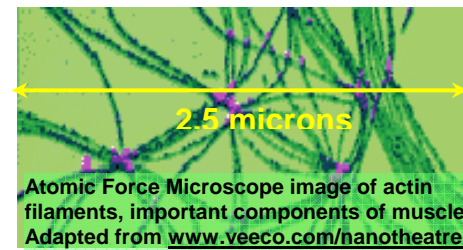
Laser device for balloon catheter atrial fibrillation surgery. A ring generator fiber in the catheter projects a ring of light, creating a conduction block around pulmonary veins. Courtesy CardioFocus, Inc.

Radiation Treatment. Radiation therapy uses the energetic particles produced by nuclear decay to destroy cancer cells. Study such particles in Modern Physics.

Preparation for New Technology & Research in Biophysics.

Biomolecular Structure & Function: measure, calculate and manipulate complex biological structures.

Scanning Probe Microscopes: Scanning tunneling, atomic force and photon tunneling microscopes image biomolecules.

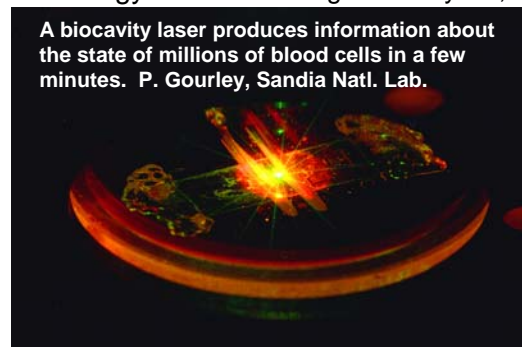


Molecular motors: nanometer-size motors run muscle, genetic replication machines.

Micro/nanotechnology: reactions carried out on semiconductor microchips; identification of chemical and biological agents.

Biosensors: fiber optics monitor and image biochemical structures and functions, detect bioactive/biowarfare agents.

Exobiology: nature and origin of early life,



important physical, chemical and biological processes, planetary search for evidence.

The Brain: operation of the brain described in terms of network and chaos theory.