General University Information
President: Ray L. Watts
Dean of Graduate School: Lori L. McMahon
University website: http://www.uab.edu
Control: Public
Setting: Urban
Total Faculty: 2,436
Total Graduate Faculty: 1,635
Total number of Students: 18,333
Total number of Graduate Students: 5,728

Department Information
Department Chairman: Prof. Ilias Perakis, Chair
Department Contact: Amanda Holt, Administrative Associate
Total full-time faculty: 16
Total number of full-time equivalent positions: 16
Full-Time Graduate Students: 32
First-Year Graduate Students: 8
Female First-Year Students: 2
Total Post Doctorates: 2

Department Address
1720 2nd Avenue South
Campbell Hall 310
Birmingham, AL 35294-1170
Phone: (205) 934-4736
Fax: (205) 934-8042
E-mail: physics@uab.edu
Website: http://www.uab.edu/physics

ADMISSIONS
Admission Contact Information
Address admission inquiries to: Graduate School Office, Lister Hill Library G-03, 1720 2nd Avenue South, Birmingham, AL 35294-0013.
Phone: (205) 934-8227
E-mail: gradschool@uab.edu
Admissions website: www.uab.edu/graduate/

Application deadlines
Fall admission:
U.S. students: July 1
Int’l. students: April 1

Application fee
U.S. students: $45
Int’l. students: $60
*US citizens and permanent residents applying to research based PhD programs at UAB are exempted from this domestic fee if submissions are made on-line.

Admissions information
For Fall of 2015:
Number of applicants: 51
Number admitted: 22
Number enrolled: 5

Admission requirements
Bachelor’s degree requirements: A Bachelor’s degree in Physics is required.

GRE requirements
The GRE is required.
The average GRE score for 2013–2014 admissions was 303 (total).

Advanced GRE requirements
The Advanced GRE is recommended.
No minimum GRE scores are set.

TOEFL requirements
The TOEFL exam is required for students from non-English-speaking countries.
PBT score: 550
iBT score: 80

Other admissions information
Undergraduate preparation assumed: Halliday and Resnick & Walker, Fundamentals of Physics; Thornton & Rex, Modern Physics; Morin, Introduction to Classical Mechanics; Griffiths, Introduction to Electrodynamics; Reif, Fundamentals of Statistical and Thermal Physics, Berkeley Course Vol. 5; Liboff, Introductory Quantum Mechanics.

TUITION
Tuition year 2015–16:
Tuition for in-state residents
Full-time students: $383 per credit
Tuition for out-of-state residents
Full-time students: $899 per credit
Total fees are included in cost of first hour of tuition, which is $606 for in-state students and $1,122 for out-of-state students.
Credit hours per semester to be considered full-time: 9
Deferred tuition plan: No
Health insurance: Available at the cost of $2,016 per year.
Academic term: Semester

Teaching Assistants, Research Assistants, and Fellowships
Number of first-year
Teaching Assistants: 5
Research Assistants: 1
Fellowship students: 1
Average stipend per academic year
Teaching Assistant: $24,000
Research Assistant: $24,000
Fellowship student: $24,000

FINANCIAL AID
Application deadlines
Fall admission:
U.S. students: March 1
Int’l. students: March 1

Loans
Loans are available for U.S. students.
Loans are available for international students.
GAPSFAS application required: No
FAFSA application required: Yes

For further information
Address financial aid inquiries to: Financial Aid-Lister Hill Library, Room G20, 1720 2nd Ave. South, Birmingham, AL 35294-0013.
Phone: (205) 934-8227
E-mail: finaid@uab.edu
Financial aid website: www.uab.edu/students/paying-for-college
Alabama

HOUSING

Availability of on-campus housing
Single students: Yes
Married students: No

For further information
Address housing inquiries to: Student Housing and Residential Life, NSRH 100, 1720 2nd Avenue S, Birmingham, AL 35294.
Phone: (205) 996-0400
E-mail: studenthousing@uab.edu
Housing aid website: www.uab.edu/students/housing

Table A—Faculty, Enrollments, and Degrees Granted

<table>
<thead>
<tr>
<th>Research Specialty</th>
<th>2015-16 Faculty</th>
<th>2015-16 Enrollment</th>
<th>Number of Degrees Granted 2015-16 (2011-16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrophysics</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Biophysics</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Condensed Matter</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Physics</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Optics</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>Full-time Grad. Stud.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>First-year Grad. Stud.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

GRADUATE DEGREE REQUIREMENTS

Master’s: Thirty semester hours of credit with thesis; minimum B (3.0 average); no residency requirements. Thesis is optional with approval of faculty. An additional “interdisciplinary track” for an M.S. degree with thesis option is also offered to non-physics majors and requires a minimum of 12 hours of graduate-level courses offered by other departments.

Doctorate: Minimum residence of three full-time academic years or equivalent periods of part-time enrollment with minimum GPA of B (3.0). Pass: oral placement examination on basic physics concepts; comprehensive examination covering the areas of classical mechanics, quantum mechanics, electromagnetic theory, oral examination on area of research specialization; oral defense of written dissertation proposal; and oral final defense of dissertation. In addition, there is an “applied physics track” for the Ph.D. degree that requires students to complete successfully a sequence of core graduate physics classes in classical mechanics, electromagnetic, quantum mechanics, statistical mechanics, and scientific communication seminars totaling 14 credit hours; 12 credit hours of elective courses in applied physics; 3 credit hours of an applied physics training course; and dissertation research hours.

Thesis: Thesis may be written in absentia.

SPECIAL EQUIPMENT, FACILITIES, OR PROGRAMS

The department has active research programs in experimental, computational and theoretical condensed-matter physics, materials science, nanophysics, optics, lasers, and laser spectroscopy. Opportunities exist for interaction with major government laboratories, including NASA Marshall Space Flight Center, Advanced Photon Source (APS) at Argonne National Laboratory, National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory, the following National Laboratories: Lawrence Livermore, Oak Ridge, and Sandia; the Naval Research Laboratory, the National Cancer Institute at the National Institutes of Health, and Center for Integrated Nanotechnology-Los Alamos National Laboratory.

Table B—Separately Budgeted Research Expenditures by Source of Support

<table>
<thead>
<tr>
<th>Source of Support</th>
<th>Departmental Research</th>
<th>Physics-related Research Outside Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government</td>
<td>$2,064,803</td>
<td></td>
</tr>
<tr>
<td>State/local government</td>
<td>$396,042</td>
<td></td>
</tr>
<tr>
<td>Non-profit organizations</td>
<td>$1,042</td>
<td></td>
</tr>
<tr>
<td>Business and industry</td>
<td>$1,042</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$2,481,887</td>
<td></td>
</tr>
</tbody>
</table>

Table C—Separately Budgeted Research Expenditures by Research Specialty

<table>
<thead>
<tr>
<th>Research Specialty</th>
<th>No. of Grants</th>
<th>Expenditures ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensed Matter Physics</td>
<td>12</td>
<td>$805,086</td>
</tr>
<tr>
<td>Optics</td>
<td>8</td>
<td>$1,040,663</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>$636,198</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>$2,481,887</td>
</tr>
</tbody>
</table>

FACULTY

Professor

Lawson, Chris M., Ph.D., Oklahoma State University, 1981. Executive Director, Alabama Experimental Program to Stimulate Competitive Research (Alabama EPSCoR); Vice Chair, Coalition of EPSCoR States. Optics. Nonlinear optics; fiber optics; optical sensors. Optics. Nonlinear optics; fiber optics; optical sensors; optical coherence imaging and tomography.

Mirov, Sergey B., Ph.D., Lebedev Physical Institute, Moscow, 1983. P.N. University Professor of Physics; Director, Center for Optical Sensors and Spectroscopies (COSS). Optics. Experimental quantum electronics; physics of color centers; solid-state tunable lasers; laser spectroscopy. Optics. Experimental quantum electronics; solid-state lasers; physics of color centers; laser spectroscopy.

Vohra, Yogesh K., Ph.D., Bombay University, 1980. University Scholar/Associate Dean (College of Arts and Science); Director, UAB Center for Nanoscale Materials & Biointegrations: (www.uab.edu/cnmb) and Campus Director, NASA-Alabama Space Grant Consortium. Applied Physics, Condensed Matter Physics. High-pressure physics and materials under extreme environments; synthesis and characterization of single crystaline diamond, nanostructured materials for biomedical applications.

Associate Professor


Solid-state theory; atomic and molecular physics; MRI modeling; chemical kinetics; simulation of nanoparticle-facilitated hyperthermia.

**Hilton, David J., Ph.D., Cornell University, 2002. Applied Physics, Optics.** Ultrafast spectroscopy and ultrashort pulse generations; ultrafast terahertz spectroscopy; correlated electron materials; superconductivity; high-magnetic field spectroscopy; magnetic semiconductors; complex functional nanomaterials; materials in extreme environments.

**Kawai, Ryoichi, Ph.D., Waseda University, 1985. Computational Physics, Condensed Matter Physics.** Condensed-matter theory; biophysics theory; materials physics theory; computational physics; complex systems.

**Stanishevsky, Andrei V., Ph.D., Belarus Academy of Sciences, 1996. Condensed Matter Physics, Nano Science and Technology.**Focused ion beam micro- and nanofabrication; PVD thin films deposition, characterization, and application; nanoparticle research.

**Assistant Professor**

**Catledge, Aaron S., Ph.D., University of Alabama at Birmingham, 1999. Atomic, Molecular, & Optical Physics, Condensed Matter Physics.** Synthesis and properties of nanostructured super-hard materials; chemical vapor deposition (CVD) of diamond films and novel nanostructured coatings for biomedical implants; composite scaffolds for tissue engineering; mechanical properties.

**Simien, Clayton E., Ph.D., Rice University, 2008. Atomic, Molecular, & Optical Physics.** Laser Cooling and Trapping, Ultracold Neutral Plasmas, Strongly Correlated Cold Atoms, Precision Spectroscopy, and Nanotechnology.

**Emeritus**

**Agresti, David G., Ph.D., California Institute of Technology, 1967. Professor Emeritus. Astrophysics, Condensed Matter Physics.**


**Martin, James C., Ph.D., Georgia Institute of Technology, 1978. Non-specialized.** Conformations of biological macromolecules; laser light scattering; optical pattern recognition; Raman spectroscopy.


**Wills, Edward L., Ph.D., University of Virginia, 1968. Research Associate Professor Emeritus.**

**Young, John H., Ph.D., Clark University, 1969. Professor Emeritus. Non-specialized.**

**Professor Emeritus**

**Shealy, David L., Ph.D., University of Georgia, 1973. Chair of Department of Physics; Director of Research Computing, UAB IT. Computational Physics, Optics.** Geometrical optics; laser beam shaping optics; radiative transfer; caustic and optical aberration theory.

**Wenger, Lowell E., Ph.D., Purdue University, 1975. Professor (Physics); Magnetic Materials and Superconductors. Condensed Matter Physics.** Synthesis and characterization of magnetic materials and nanostructures; superconductivity.

**Research Associate Professor**

**Fedorov, Vladimir V., Ph.D., General Physics Institute, Russian Academy of Sciences, 1999. Non-specialized.** Physical and mathematical science; coherent and laser spectroscopic characterization of doped laser materials; solid-state lasers; laser spectroscopy for molecular-sensing applications.

**Research Assistant Professor**

**Martsynkin, Dmitri V., Ph.D., University of Alabama at Birmingham, 2004. Development and spectroscopic characterization of doped laser materials; solid-state lasers; laser spectroscopy for molecular-sensing applications.**

**Tsui, Georgiy, Ph.D., Ukraine Academy of Sciences, 1984. Physics and mathematics; physical and quantum electronics.**

**Adjunct Faculty**

**Gerakines, Perry A., Ph.D., Rensselaer Polytechnic Institute, 1998. Astrophysics.** Astrophysics; interstellar molecules; interstellar dust; laboratory astrophysics; infrared astrophysics; comets; planetary science; origin of life; observational astronomy.

**Instructor**

**Devore, Todd, Ph.D., University of Alabama at Birmingham, 1999. Coordinator of Undergraduate Laboratories. Computational Physics, Physics and other Science Education.** Computational physics.

**Mehr, Rob, Ph.D., University of Alabama, 2001. Astronomy.** Computational applications to theoretical astrophysical problems.

**DEPARTMENTAL RESEARCH SPECIALTIES AND STAFF**

**Theoretical**

Astrophysics. Computer modeling of astrochemical processes and planetary data from Mars and the outer solar system; origin of the solar system; impact. Agresti, Gerakines.

Biophysics. Macromolecular structure; assembly and dynamics by computer modeling. Harrison, Kawai, Nordlund.

Computational Physics. The research programs in Computational and Theoretical Physics span projects from theoretical studies studying the effect of non-equilibrium fluctuation to numerical simulations utilizing finite elements to test the effect of RF heating on brain tissue to developing a multilevel, integrative genomics approach for studying diabetes. In these programs, statistical mechanics, thermodynamics, nonlinear dynamics, percolation theory, network theory, and electromagnetic theory are utilized. Harrison, Kawai, Shealy.

Condensed Matter Physics. Low-dimensional systems; defects in insulators and semiconductors; positron states in condensed matter; simulation of chemical vapor deposition processes; computational electromagnetics; surface adsorption; ab initio molecular dynamics simulations; computational algorithms applicable to massively parallel computers; quantum Monte Carlo simulations; non-equilibrium statistical mechanics; stochastic processes. Agresti, Camata, Harrison, Kawai, Shealy, Simien.

Optics. Laser physics; laser spectroscopy; fiber, laser, soft X-ray/UV optics; geometrical optics; nonlinear optics; laser beam shaping; optical design; caustic and optical aberration theory. Hilton, Mirov, Shealy.

**Experimental**

Astrophysics. Astrochemistry of cosmic ices and complex interstellar molecules; molecular evolution and precursors of life; hydrothermal systems; instruments for in situ planetary science and life search; participation in the Mars Rover exploration missions; mass extinctions and Pre-Cambrian paleontology; bringing to bear tools such as Mössbauer, uv/vis/ir, Raman, and mass spectroscopies, XRD, and chemical analysis. Agresti, Gerakines, Mohr.
Biophysics. DNA and protein structure and function via continuous and time-resolved fluorescence spectroscopy and molecular calculations; fiber-optic biosensors; TIRF; FRET; transient kinetics of molecular interactions; energy transfer and photophysics of sunscreens; spectroscopy and imaging of assembly and interactions between biomolecules and nanoparticles. Camata, Catledge, Fedorov, Mirov, Nordlund, Vohra.

Condensed Matter Physics. EPR studies of bulk crystals and thin films; optical Mössbauer effect; design and construction of portable Mössbauer spectrometer for use in extraterrestrial studies; high-pressure physics; electrical studies of semiconducting and insulating materials; electrical and optical properties of bulk synthetic diamond and diamond thin films; radiational defects in crystals; optical properties of laser crystals; time-resolved laser spectroscopy; synthesis and characterization of metallic, semiconducting, and magnetic materials/nanostructures; superconductivity; aerosol strategies. Agresti, Camata, Catledge, Fedorov, Gerakines, Hilton, Lawson, Martyshkin, Mirov, Stanishevsky, Tsoi, Vohra, Wenger, Zvanut.

Materials Science, Metallurgy. Nanostructured materials; carbon nanotube synthesis and properties; nanoscale direct writing and patterning; nanocomposite biomaterials. Camata, Catledge, Stanishevsky, Vohra, Wenger.

Optics. Laser optics; laser resonators; solid-state laser materials; tunable lasers; laser spectroscopy; UV holographic projection processing of materials; physiological optics; nonlinear optics and nonlinear optical materials; diamond windows for optical spectroscopy; fiber optics; optical sensors; optical imaging; optical coherence; tomography. Camata, Catledge, Fedorov, Hilton, Lawson, Martyshkin, Mirov, Shealy, Stanishevsky, Vohra.

View additional information about this department at www.gradschoolshopper.com