Graduate Studies in Physics & Astronomy at LSU

We have active research that covers all the areas in modern physics and astronomy. We have world-class research groups in experimental gravity, quantum optics and quantum information, theoretical General Relativity, and medical physics.

At LSU you will have access to a number of great research facilities. These include the LIGO gravitational wave detector, the CAMD synchrotron light source, the Queen Bee supercomputer, the Auger cosmic-ray detectors, and the Mary Bird Perkins Cancer Center.

Our department has 48 faculty and 78 graduate students. We grant a Ph.D. in physics; as well as an M.S. in medical physics.

All new graduate students are supported with Fellowships or graduate assistantships. The latest incoming class of graduate students has an average yearly support of $23,000 plus a full tuition waiver. We receive more than $5.3 million annually in research grants, and this means that after finishing your coursework, then your financial support will be to pursue your own thesis research.

The University

LSU has 30,000 undergraduates and 6000 graduate students (including 1700 international students). We are in Baton Rouge, the capital of Louisiana on the wide Mississippi River, with an active live music scene and many Mardi Gras parties and parades. LSU is just an hour's drive away from New Orleans, famed for Mardi Gras, Jazz Fest, the French Quarter, and many other legendary diversions. Being far from the coast, Baton Rouge does not have serious problems with hurricanes.

The University campus, with its live oaks, magnolias, and crepe myrtles, is one of the most beautiful in the country. The red pantile roofs, honey-colored stucco, and graceful arches, imitative of northern Italian Renaissance villas, make its architecture unique among U.S. campuses. The entire campus has wireless connections everywhere.

JAZZ

CAJUN FOOD

CAJUN MUSIC

NICE WINTERS

VERSUS
Research Areas:

Astronomy & Astrophysics
LSU astrophysicists are using ground-based observatory, spacecraft data, and theory to work out the accretion around black holes and neutron stars. Also, we are the leaders in using Gamma-Ray Bursts to measure how Dark Energy changes out to a redshift of >6.6.

Condensed Matter & Material Science
LSU carries out cutting edge research on electronic and magnetic materials. Experimental activities range from materials growth (bulk, film, and nanowires) to measuring the properties of magnetic, superconducting, and semiconducting systems at ultra-low temperatures and high magnetic fields. We take advantage of the LSU owned and managed synchrotron, CAMD. Our theorists are accurately computing band structure of correlated electron materials, working to understand exotic properties of quantum critical systems, and exploring superfluidity of ultracold atomic gases.

Particle Physics
LSU experimenters are measuring the neutrino oscillation parameters with the Sudbury Neutrino Observatory, MiniBooNE experiment at FermiLab, and the T2K long baseline experiment in Japan. We also are seeking to discover the GZK cutoff for the highest energy cosmic rays above $10^{20}$ eV at the Pierre Auger Observatory in Argentina. Cosmic rays and black holes are our targets for balloon flights in Antarctica as well as the GLAST satellite.

Theoretical General Relativity
LSU theorists have now been able to follow the collision of inspiralling black hole binaries over the entire event. LSU has one of the best theoretical GR groups in the world, has close access to some of the fastest supercomputers in the world on campus, plus a close connection with the LSU gravitational wave experimentalists from LIGO.

★ LSU SPORTS ★

Recent
National
Championships:
- Football
- Baseball
- Women’s Track
- Men’s Track

★ MARDI GRAS ★
AMO & Quantum Science

With six professors, the LSU group in theoretical atomic, molecular, and optical physics is among the largest in the country. One of our specialties is quantum sciences and technologies, including quantum optics, information, sensing, imaging and photonic materials. We also study the interaction of atoms and strong electric and magnetic fields, and in particular the dynamics and control of electrons on an attosecond time scale.

Experimental Gravitation

LSU scientists are part of a world-wide collaboration searching for gravitational waves. LSU is at an advantage, with one of the largest and most diverse groups in the world, with the Laser Interferometer Gravitational-wave Observatory (LIGO) Livingston Observatory only 30 miles away. The LSU group contributes to the research and installation of the LIGO detectors, to the characterization and calibration of the detectors’ data, and to the analysis of the data searching for collisions of neutron stars and black holes, supernova explosions, cosmological background, and the unknown.

Medical Physics

Medical physicists research new imaging and treatment technologies for early detection, diagnosis, and treatment of human disease. X-ray and gamma ray detection is being studied for imaging breast, heart, and other diseases. Synchrotron radiation is being studied for new therapy and imaging methods. Applications of image-guided radiotherapy, tomotherapy, and gated radiotherapy and development of new electron therapy technology are being studied with Mary Bird Perkins Cancer Center.
FREQUENTLY ASKED QUESTIONS ABOUT APPLICATIONS FOR

Question: **Why LSU Physics & Astronomy?**
Answer: Because we are a top quality research University with a wide variety of fun programs in physics and astronomy. We have some of the best programs in the world for gravity research (both theory and experiment), quantum optics and quantum information, medical physics, and compact objects in astrophysics. We have great facilities with LIGO (for gravity wave detection), CAMD (a synchrotron light source for many applications in solid state physics), Queen Bee (in the world's top 25 largest supercomputers), and the Mary Bird Perkins Cancer Center (for medical physics). Our faculty are major players in some of the most exciting groups around; including Auger (for the highest energy cosmic rays), Swift (the latest Gamma-Ray Burst satellite), and T2K (for neutrinos). The promise of these programs includes a likely Nobel Prize for LIGO and a median starting salary of $80,000/year for our medical masters graduates. All of this translates into great opportunities for you to work on a fun thesis that will place you in the front-line of science, and this will translate into a good job for you when you graduate from LSU.

Question: **When are applications due?**
Answer: For admissions starting in August, the deadline for us to receive completed applications is 25 January of the same year. (For admissions starting in January, the deadline is 15 October of the previous year.) Applications received after January 25 and until May 15 will still be considered but in general have a lower acceptance rate.

Question: **Do you offer graduate assistantships or other forms of financial support?**
Answer: Yes, essentially all students accepted into our Department are offered financial support in the form of a graduate assistantship or Fellowship. Our average starting yearly salary for the latest incoming class is $23,000 per year plus a full tuition waiver.

Question: **Must I pay the $25 application fee?**
Answer: No. Mail your application directly to our Department and don’t pay the application fee.

Question: **Where should I send the completed application?**
Answer: Send it directly to our Department. The mailing address is "Graduate Admissions, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA, 70803, USA".

Question: **What do I need to send for applying to LSU?**
Answer: You must send in:
*GRE scores (including Quantitative and Verbal). You must arrange for the CRE scores to be sent directly to us by ETA. [Depending on the date you take the exams, we are willing to consider photocopies of official reports for initial consideration, but you must arrange for an official report before we can formally admit you.]
*Official transcript of all colleges attended. [We require the official transcripts from all your colleges before we can formally admit you, but for initial considerations we can work with photocopies of official forms.]
*Three letters of recommendation from people who know your research and education experiences. The letters can be included in a signed and sealed envelope along with your application, emailed to us (gradstudy@phys.lsu.edu), or mailed directly to us ("Graduate Admissions, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA, 70803, USA").
*TOEFL scores (only if coming from outside America and not with a degree from an English-speaking college).
Question: What are typical and minimum scores for admission?
Answer: The incoming class from two years ago had their GRE Verbal+Quantitative (V+Q) scores higher than 1150, with a median V+Q score of 1300. Last year’s incoming class had V+Q scores higher than 1360, with a median V+Q score of 1420. We do not require the Physics GRE test, but it can help a lot for getting accepted. LSU imposes a minimum Grade Point Average (GPA) of 3.00 (i.e., a B average). For non-native English speakers, we do require a TOEFL score of over 600 (250 on the computer based exam).

Question: Whom should I contact if I have more questions?
Answer: For finding out more about a specific group or research topic, look for information in www.phys.lsu.edu and do not hesitate to email our faculty with questions. For questions on courses and such, contact Gabriela González (225-578-0468 or gonzalez@lsu.edu). For questions on applications and such, contact Brad Schaefer (225-578-0015 or schaefer@lsu.edu). For procedural questions or to get an admissions packet, contact Arnell Dangerfield (225-578-1193 or adanger@lsu.edu). For general queries, try gradstudy@phys.lsu.edu or the Department office at 225-578-2261. We have much more information, including a useful FAQ and application forms, at http://www.phys.lsu.edu/dept/grad/