The path to graduate school
A source for resources

Programs and resources
Statistical Research Center
History Programs
Student Programs
Government Relations
Science News and Media Services
Physics Today magazine
Industry Outreach
Career Resources
AIP Publishing

AIP's highly cited journals form the core of physics literature in libraries around the world.

AIP Journals
AIP Conference Proceedings
1. Search by school
2. Specialty for degree program
3. Search by state
4. Degree type
5. Outside the U.S.
6. Sort graduate programs by various descriptors, acceptance rate, financial aid package, etc.
7. Browse graduate programs by various descriptors

... two principal places to look
The GRE Physics Exam

* ... an important key that opens doors to graduate schools
### 2017-2018 Test Dates

#### For Paper-delivered Testing in the United States and Puerto Rico

**Note:** All deadlines below are registration receipt dates at ETS. All dates shown are (MM/DD/YY).

<table>
<thead>
<tr>
<th>Test Dates</th>
<th>Registration Deadlines</th>
<th>Scores Available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regular Deadline</td>
<td>Late Deadline¹</td>
</tr>
<tr>
<td>10/07/17</td>
<td>09/01/17</td>
<td>09/08/17</td>
</tr>
<tr>
<td>11/04/17</td>
<td>09/29/17</td>
<td>10/06/17</td>
</tr>
<tr>
<td>02/03/18</td>
<td>12/29/17</td>
<td>01/05/18</td>
</tr>
</tbody>
</table>

¹ Late registration is available for online registration only for a fee of US$25.

² Monday test dates will be October 9, 2017, November 6, 2017, and February 5, 2018.
Official Test Prep from ETS

Nobody knows our tests better than we do. We offer free practice tests and tips to help you prepare for your GRE Subject Test. Check them out today.
Overview

• The test consists of approximately 100 five-choice questions, some of which are grouped in sets and based on such materials as diagrams, graphs, experimental data and descriptions of physical situations.

• The aim of the test is to determine the extent of the examinees' grasp of fundamental principles and their ability to apply these principles in the solution of problems.

• Most test questions can be answered on the basis of a mastery of the first three years of undergraduate physics.
• The International System (SI) of units is used predominantly in the test. A table of information representing various physical constants and a few conversion factors among SI units is presented in the test book.

• The approximate percentages of the test on the major content topics have been set by the committee of examiners, with input from a nationwide survey of undergraduate physics curricula. The percentages reflect the committee's determination of the relative emphasis placed on each topic in a typical undergraduate program. These percentages are given below along with the major subtopics included in each content category. In each category, the subtopics are listed roughly in order of decreasing importance for inclusion in the test.

• Nearly all the questions in the test will relate to material in this listing; however, there may be occasional questions on other topics not explicitly listed here.
1. **CLASSICAL MECHANICS — 20%**

(such as kinematics, Newton’s laws, work and energy, oscillatory motion, rotational motion about a fixed axis, dynamics of systems of particles, central forces and celestial mechanics, three-dimensional particle dynamics, Lagrangian and Hamiltonian formalism, noninertial reference frames, elementary topics in fluid dynamics)
2. ELECTROMAGNETISM — 18%

(such as electrostatics, currents and DC circuits, magnetic fields in free space, Lorentz force, induction, Maxwell's equations and their applications, electromagnetic waves, AC circuits, magnetic and electric fields in matter)
3. OPTICS AND WAVE PHENOMENA — 9%

(such as wave properties, superposition, interference, diffraction, geometrical optics, polarization, Doppler effect)

4. THERMODYNAMICS AND STATISTICAL MECHANICS — 10%

(such as the laws of thermodynamics, thermodynamic processes, equations of state, ideal gases, kinetic theory, ensembles, statistical concepts and calculation of thermodynamic quantities, thermal expansion and heat transfer)
5. QUANTUM MECHANICS — 12%

(such as fundamental concepts, solutions of the Schrödinger equation (including square wells, harmonic oscillators, and hydrogenic atoms), spin, angular momentum, wave function symmetry, elementary perturbation theory)

6. ATOMIC PHYSICS — 10%

(such as properties of electrons, Bohr model, energy quantization, atomic structure, atomic spectra, selection rules, black-body radiation, x-rays, atoms in electric and magnetic fields)
7. SPECIAL RELATIVITY — 6%
(such as introductory concepts, time
dilation, length contraction, simultaneity,
energy and momentum, four-vectors and
Lorentz transformation, velocity addition)

8. LABORATORY METHODS — 6%
(such as data and error analysis,
electronics, instrumentation, radiation
detection, counting statistics, interaction
of charged particles with matter, lasers
and optical interferometers, dimensional
analysis, fundamental applications of
probability and statistics)
9. SPECIALIZED TOPICS — 9%

Nuclear and Particle physics (e.g., nuclear properties, radioactive decay, fission and fusion, reactions, fundamental properties of elementary particles), Condensed Matter (e.g., crystal structure, x-ray diffraction, thermal properties, electron theory of metals, semiconductors, superconductors), Miscellaneous (e.g., astrophysics, mathematical methods, computer applications)
Those taking the test should be familiar with certain mathematical methods and their applications in physics. Such mathematical methods include single and multivariate calculus, coordinate systems (rectangular, cylindrical and spherical), vector algebra and vector differential operators, Fourier series, partial differential equations, boundary value problems, matrices and determinants, and functions of complex variables. These methods may appear in the test in the context of various content categories as well as occasional questions concerning only mathematics in the specialized topics category above.
*You can download a free practice book...!!

... and you can practice!!
PHYSICSGRE.COM
for prospective and current physics graduate students

* ... another place to look
* Going to grad school: what does it take?
Can I afford to go to grad school?

As a PhD student, most universities have a policy on financial assistance that will typically allow you to go through your entire graduate program at no cost to you. The stipend (~$25 k) that goes along with graduate teaching or research assistantships is sufficient to provide for living expenses, but grad school is certainly not a way to build up your savings account. If you manage to obtain an outside fellowship, you will have the greatest possible freedom in your choice of PhD advisors and dissertation topics. Master’s students generally don’t get assistantships. Working toward a PhD in physics is a full-time activity, so you shouldn’t plan on supplementing your income with an additional job.
What can I do with an advanced degree?

Beyond becoming professional scientists, physics students pursuing advanced degrees learn how to solve new problems, especially using mathematical methods of modeling and analysis. The skills you get in an advanced physics degree are useful in any career that involves solving challenging problems, which is to say just about anything. Students with advanced physics degrees go on to a range of technical careers: research at national laboratories; industrial and technical research in fields ranging from semiconductor fabrication to lasers and optics to financial modeling to medicine; and, of course, research and teaching at universities. Average earning power is significantly higher with an advanced degree. The bar chart shows a comparison from 2003:
If you have the talent, can you afford not to go to grad school?
What’s it like to go to grad school?

Of course, the above benefits come with a cost: an advanced physics degree is one of the most challenging and intellectually demanding pursuits there is. You’ll be expected to work hard, and often you’ll spend long hours finishing up that quantum mechanics problem set or getting data ready right before that important conference. Not everyone is cut out for a Ph.D. in physics. But if you are up to the challenge, graduate school will be one of the most rewarding experiences of your life. There is nothing comparable to the high you get from finally getting your experiment to work or nailing a hard theoretical problem after months or years of effort. And your dissertation, if you put in the effort, will be something to be truly proud of.
Limits imposed by ionizing radiation on the long-term survival of trapped bacterial spores: beta radiation

A. J. NIGASTRO*, R. H. VREELAND; and W. D. ROSENZWEIG;

(R eceived 9 January 2002; revised 14 May 2002)

Introduction

Some species and strains of bacteria (i.e., Bacillus and Clostridium) are able, when conditions are adverse, to enter a dormant state, even when metabolic activities are severely curtailed. Such spores, trapped within fluid inclusions of crystals, are resistant to ionizing radiation. In the present study, the effects of ionizing radiation on the long-term survival of spores trapped within fluid inclusions of crystals were examined.

2. Lethal damage to DNA

The most significant damage to DNA that can lead to cell death is recognized to be double-strand breaks (DSB) and the accumulation of angular momentum and is explained as a zero angular momentum. The model permits the evaluation of relevant parameters. From the model, the stress function, which is generated at the source of the radiation, is 0.015. The stress function is calculated to scale with body length to the 0.42 power and mass to the 0.32 power. At 0.21 power, scaled up to 1 m, the stress was calculated at 138N. The death rate appears to help revocer the flexibility of the alligator. Stress forces generated by the spinning maneuver are predicted to increase disproportionately with alligator size, allowing dismemberment of large prey.

Key words: death roll, alligator, Alligator mississippiensis, feeding, malleability.
phosphodiester moiety always results in a SSB. Finally, the probability that a randomly emitted particle will pass a DNA molecule and induce a SSB is
\[
P_{\text{SSB}} = \frac{2(\lambda + 1 \text{ nm})}{4\pi \left( \frac{3}{4} V_{\text{inc}}^{1/3} \right)^2} L \left( \frac{3.4 \text{ nm}}{10 \text{ base pairs}} \right) \times \frac{2}{S} \left( \frac{5 \text{ nm}^2}{\lambda + 1 \text{ nm}} \right)^{1/2}.
\]

Solving this expression for \(T_F\) yields
\[
T_F = \frac{t_{1/2}}{\ln 2} \left[ \frac{SN_{\text{SSB}}M}{(1.12 \times 10^{-19} \text{ mm}^3) CV_{\text{inc}}^{1/3} N_A L} \right]^{1/2}
\]
\[
= \frac{t_{1/2}}{\ln 2} \left[ \frac{-4 \ln R}{2b + 1} \right]^{1/2} \times \left[ \frac{SM}{(1.12 \times 10^{-19} \text{ mm}^3) CV_{\text{inc}}^{1/3} N_A L^{1/2}} \right]
\]

where used again is the Taylor series expansion \(\ln(1+x) \approx x\), for \(x\) small compared to 1.

\[D = \frac{C V_{\text{inc}} N_A}{M} \exp [(\ln 2)t/t_{1/2}] \left(1 - \frac{9.37 \times 10^{-14} J}{9.37 \times 10^{-8} \text{ Gy}} \right)\]

\[= \frac{C N_A}{M \rho} \exp [(\ln 2)t/t_{1/2}] - 1 \quad (9.37 \times 10^{-8} \text{ Gy})
\]

where now \(\rho\) is in g/cm\(^3\). For a DSB rate of \(10^{-2} \text{ DSB Gy}^{-1} \text{ Mbp}^{-1}\), \(10^{-8} \text{ DSB Gy}^{-1} \text{ bp}^{-1} L\), the number of single-track DSB is given by
\[N_{\text{DSB, single-track}} = \frac{C N_A L}{M \rho} (9.37 \times 10^{-16}) \times \exp [(\ln 2)t/t_{1/2}] - 1\]

*Figure 5.* The dependence of the surviving fraction of spores on the number of trapped individuals. For populations exceeding about 50000 individuals, the surviving fraction is nearly independent of the number of spores initially trapped within the inclusion. For these calculations, \(b = 2.64\) and the concentration of \(^{40}\text{K}\) is \(6.5 \times 10^{-11}\) g/mm\(^3\).
The efficacy of the model may also be compared with measured rates of induced damage to DNA. Newman et al. (1997) irradiated Chinese hamster V79 cells with alphas from $^{238}\text{Pu}$ which possessed an incident energy at the cells of $3.5 \text{ MeV}$ and corresponded to an LET of $110\text{keV}/\mu\text{m}$. The range of these alphas within the cell is $31.8\mu\text{m}$, and using equation 11 the average distance $S$ between energy deposition structures is $1.6 \times 10^{-6}\text{mm}$. From the authors’ model, the number of SSB induced per Gy per bp is given by equation 20 divided by equation 22 and divided by $L$, i.e.

$$(1.12 \times 10^{-19}\text{mm}^3)V_{\text{inc}}^{1/3} \rho/S,$$

which for this case is $5.7 \times 10^{-6}$ SSB Gy$^{-1}$ bp$^{-1}$. Table 1 indicates that, depending on the size of the genome, $b$, and the surviving fraction of spores, roughly 2000 SSB need to accumulate so as to form a DSB. The 4% contribution of single-track DSB is not significant at this level of approximation. Thus, we expect a DSB formation rate of approximately $3 \times 10^{-9}$ DSB Gy$^{-1}$ bp$^{-1}$. This rate agrees with the value of $3.15 \pm 0.29 \times 10^{-9}$ DSB Gy$^{-1}$ bp$^{-1}$ for alphas measured by Newman et al. (1997) using the distribution size method (Lehmann and Ormerod 1970). This agreement is, to some extent, fortuitous and coincidental, for the present model would have predicted values a factor of 2 higher and lower than this depending on the values of $b$, $L$, and $F$. Using the model of Cook and Mortimer (1991), Newman et al. (1997) find for alphas that the breakage frequencies ranged from $4.5 \pm 0.8 \times 10^{-9}$ DSB Gy$^{-1}$ bp$^{-1}$ for fragments with a mean weight of 5 Mbp to $633 \pm 140 \times 10^{-9}$ DSB Gy$^{-1}$ bp$^{-1}$ for fragments of 14 kbp mean weight. The agreement with the present authors’ model is still satisfying.
Death Roll of a Crocodile
If the total angular momentum of a system is zero, it is zero about any axis. The angular momentum projected onto the RR’-axis is therefore:

\[ \mathbf{L}_{\text{proj}} = \omega_{\text{proj}} (0 \cos \phi - 0 \sin \phi) + \omega (0 \cos \phi + 0 \sin \phi) = \omega_{\text{proj}} (0 \cos \phi + 0 \sin \phi) = \omega_{\text{proj}} (0 \cos \phi + 0 \sin \phi) \]

where we have used the fact that \(d\mathbf{L}_{\text{proj}} = \omega_{\text{proj}} \mathbf{L} \) with \( \mathbf{L} \) the length of the head. After rearranging terms to form the ratio \( \omega_{\text{proj}} / \omega \), we find:

\[ \frac{\omega_{\text{proj}}}{\omega} = \frac{\alpha \cos \phi + \beta \sin \phi}{\alpha \cos \phi - \beta \sin \phi} \]

However, for \( \alpha = 5^\circ \) and \( \phi = 90^\circ \), which are typical values for these angles (Fig. 4), this expression reduces to:

\[ \frac{\omega_{\text{proj}}}{\omega} = \frac{1 + 2 \alpha \cos \phi}{1 - 2 \alpha \cos \phi} \]

This expression is consistent with the observed characteristics of the death roll (see below).

It is important to note that the \( \omega_{\text{proj}} \) motion (i.e., the motion of the animal revolving around the RR’-axis) is a reaction to the rolling motions initiated by the animal after it fastens onto its prey. Before the spin is initiated the angular momentum of the alligator is observed to be zero, which remains zero during the spin, and is observed to be zero when the spin terminates. The motion around the RR’-axis, which occurs at an angular frequency approximately equal to \( \omega_{\text{proj}} \), results in the rolling motions, resulting purely from the conservation of angular momentum. This is roughly analogous to how a figure skater controls spin rate (Giancoli, 1985). By voluntarily bringing both arms close to his or her body from an extended position, a figure skater can increase angular speed to conserve angular momentum. Rather than this one-dimensional case, the death roll is a two-dimensional example.

**Discussion**

**Significance of prey inertia to crocodilian spin feeding**

Spinning is maneuver to reduce large prey to small enough pieces that a crocodile can swallow (McHenny, 1935; Neill, 1971; Geggisberg, 1972; Pooley and Gans, 1976). The conical teeth of crocodilians are useful for grasping prey with a large bite force (Erickson et al., 2003), but not for tearing and cutting flesh (Guggisberg, 1972). Spinning is a mechanism that can tear apart large prey by subjecting the tissue to torsional stresses. Animals and their tissues are weak in torsion (Gordon, 1978; Carney, 2002). The spinning maneuver is used predominately by crocodilians, with broad, short snouts, which feed on large prey and on a more general diet (Cleuren and De Vree, 2000). This skull structure can resist the substantial forces associated with the maneuver (Cleuren and De Vree, 1992).

Inertia of the prey is required for the maneuver to be effective. Spinning does not work with small prey animals, because the crocodile spins, the prey will also rotate. Thus, when groups of crocodilians (e.g., Crocodylus niloticus) feed on a carcass at the same time (Pooley and Gans, 1976; Guggisberg, 1972; Ross, 1989), the inertia added by attached predators would facilitate...
If the total angular momentum of a system is zero, it is zero about any axis. The angular momentum projected onto the RR'-axis is therefore:

\[0 = m_w(\text{I}_{\text{p}}\sin \theta - \text{f}_{\text{p}}\sin \theta) + m_w \text{I}_{\text{p}} \cos \theta + m_w \text{I}_{\text{p}} \cos \theta - m_w(\text{I}_{\text{p}} \cos \theta + \text{f}_{\text{p}} \cos \theta - m_w(\text{I}_{\text{p}} \sin \theta))\]

where we have used the fact that d=I_p sin(θ) with I_p the length of the head. After rearranging terms to form the ratio \( \omega_w/\omega_{\text{p}} \), we find:

\[\omega_w/\omega_{\text{p}} = \frac{I_{\text{p}} \cos \theta + I_{\text{p}} \cos \theta + (m_w I_{\text{p}} - I_{\text{p}}) \sin \theta + I_{\text{p}} \sin \theta}{I_{\text{p}} \cos \theta + I_{\text{p}} \cos \theta + I_{\text{p}}}\]

However, for \( \theta=45^\circ \) and \( \phi=90^\circ \), which are typical values for these angles (Fig. 4), this expression reduces to:

\[\omega_w/\omega_{\text{p}} = \frac{I_{\text{p}} + 2I_{\text{p}} + m_w I_{\text{p}} - I_{\text{p}} - 2I_{\text{p}}}{2I_{\text{p}} + 2I_{\text{p}}}\]

This expression is consistent with the observed characteristics of the death roll (see below).

It is important to note that the \( \omega_w/\omega_{\text{p}} \) motion (i.e., the motion of the animal revolving around the RR'-axis) is a reaction to the rolling motions initiated by the animal after it fastens onto its prey. Before the spin is initiated, the angular momentum of the alligator is observed to be zero, must remain zero during the spin, and is observed to be zero when the spin terminates. The motion around the RR'-axis, which occurs at an angular frequency approximately an order of magnitude slower than the rolling motions, results purely from the conservation of angular momentum. This is roughly analogous to how a figure skater conserves angular momentum (Giancoli, 1985). By voluntarily bringing both arms close to his or her body from an extended position, a figure skater can increase angular speed to conserve angular momentum. Rather than this one-dimensional case, the death roll is a two-dimensional example.

**Discussion**

**Significance of prey inertia to crocodilian spin feeding**

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We discovered that juvenile alligators are capable of performing the death roll. Previous reports of spinning were associated with large crocodilians subduing or dismembering large prey items (McIlhenny, 1935; Pooley and Gans, 1976). Hatchling (50 g) and juvenile (100–550 g) salt-water crocodiles (*Crocodylus porosus*) feeding on carrion were observed to use side-to-side head shaking, rather than spinning, to detach small pieces (Davenport et al., 1995). Side-to-side head shaking was used to detach small pieces of the carrion. However, the carrion was a large fish, which may not have offered resistance to tearing (Davenport et al., 1990). The toughness of the food presented in this study provided sufficient resistance to initiate the spinning behavior.

**Conservation of angular momentum in crocodilian death rolls**

The ferocity of the death roll of alligators and crocodiles is particularly enhanced by the rapid speed of the spinning motions. How can the animal generate these motions and still conserve angular momentum? From a configuration where the symmetry axes of the head, body and tail are all aligned, the animal quickly bends itself into a C-shape and commences spinning. Consequently, each body part possesses a vector angular momentum (Fig. 3). While the horizontal components of the angular momenta of the head and tail largely cancel, the vertical components add. This angular momentum vector, however, is canceled by a more subtle motion of the entire animal. As a reaction to the spinning motion, the animal also revolves around a roll axis roughly parallel to the animal’s trunk (body). The roll axis runs through its snout, which is fastened onto meat, and a point approximately one-quarter of the distance from base of the tail to its tip. The revolution of the animal’s head, body and tail about the roll axis also has an angular momentum, which is directly opposite to the vector sum of the angular momentums of each body segment. Thus, the initial angular momentum is zero, the total angular momentum during the roll is zero, and when the maneuver terminates by the alligator straightening, it remains zero.

The reason that the motion about the roll axis is less apparent than the spinning motions of the head, body and tail is because
What do I need to do before applying to grad school?

**Study for the physics GRE.** This will help improve your chance of getting admitted. However, in studying for this exam, remember that passing the GRE is only one of many criteria for success in grad school, and therefore a bad score won’t sink your application if the rest is good. Don’t study for the test alone (i.e., by doing practice tests): try to use the GRE preparation as a time of in-depth review, because that will go a long way towards mastering the qualifying examinations required by many departments.
How do I go about applying to grad school?

The official application deadline at most Physics Departments falls in January or February, so you should aim to submit your application in December. You should talk to professors about writing you recommendation letters before the end of Fall semester. Also, write a letter of intent to accompany your application, summarizing in about 500 words how you see graduate studies mesh with your prior experience and career goals. The process of doing this can be valuable in itself since it leads you to identify areas of interest and perhaps also directions you’d like to avoid going into.
You have the Faculty’s best wishes for success ... regardless of the path you take!
What are the opportunities open to me when I graduate?
What's a Bachelor's Degree Worth?

Typical Salaries for Bachelor's Degree Recipients, Class of 2015

Bachelor's Field
- Computer Science
- Aerospace Engineering
- Physics
- Chemical Engineering
- Electrical Engineering
- Mathematics
- Mechanical Engineering
- Finance
- Civil Engineering
- Registered Nursing
- Accounting
- Business Admin/Mgmt
- Chemistry
- Psychology
- Biology

Starting Salary in Thousands

Note: Typical salaries are the middle 50%, i.e. between the 25th and the 75th percentiles.

Reprinted from the Spring 2016 Salary Survey, with permission of the National Association of Colleges and Employers, copyright holder.
Initial Outcomes of Physics Bachelors, Classes of 2013 & 2014 Combined

- Graduate Study: 54%
- Workforce: 7% Part-Time Employed, 34% Full-Time Employed
- 5% Unemployed

Figure based on the responses of 4,886 individuals

www.aip.org/statistics
There are good reasons not to go to graduate school. 

Money is not one of them!
Initial Employment Sectors of Physics Bachelors, Classes of 2013 & 2014 Combined

- Private Sector: 65%
- College & University: 10%
- Other: 5%
- High School: 9%
- Active Military*: 6%
- Civilian Gov't, National Lab: 5%

*Data do not include degree recipients from the three military academies (US Naval Academy, US Military Academy, US Air Force Academy).

** Data include two- and four-year colleges, universities, and university affiliated research institutes.

Figure based on the responses of 1,657 individuals

www.aip.org/statistics
Field of Employment for Physics Bachelors in the Private Sector, Classes of 2013 & 2014 Combined

- Engineering: 36%
- Computer or Information Systems: 23%
- Non-STEM: 25%
- Other STEM: 13%
- Physics or Astronomy: 5%

STEM refers to natural science, technology, engineering, and mathematics.
Figure is based on 1,141 responses

www.aip.org/statistics
Job Titles of Positions filled by Physics Graduates with Bachelor Degrees

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Computer Hardware / Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Engineer</td>
<td>Software Engineer</td>
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<tr>
<td>Electrical Engineer</td>
<td>Programmer</td>
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<tr>
<td>Design Engineer</td>
<td>Web Developer</td>
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<tr>
<td>Mechanical Engineer</td>
<td>IT Consultant</td>
</tr>
<tr>
<td>Project Engineer</td>
<td>Systems Analyst</td>
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<tr>
<td>Optical Engineer</td>
<td>Technical Support Staff</td>
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<tr>
<td>Manufacturing Engineer</td>
<td>Analyst</td>
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<td>Manufacturing Technician</td>
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<td>Laser Engineer</td>
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<td>Associate Engineer</td>
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<td>Engineering Technician</td>
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<td>General Engineer</td>
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<td>Technical Services Engineer</td>
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| Education                                         |                             |
| High School Physics Teacher                       |                             |
| High School Science Teacher                       |                             |
| Middle School Science Teacher                     |                             |

| Research and Technical                             |                             |
| Research Assistant                                |                             |
| Research Associate                                |                             |
| Research Technician                               |                             |
| Lab Technician                                    |                             |
| Lab Assistant                                     |                             |
| Accelerator Operator                              |                             |
| Physical Sciences Technician                      |                             |
Typical Starting Salaries for Physics Bachelors, Classes of 2013 & 2014 Combined

This figure includes only bachelors in full-time, newly accepted positions. Typical salaries are the middle 50% i.e. between the 25th and 75th percentiles. STEM refers to positions in natural science, technology, engineering, and math. Data are based on respondents holding potentially permanent jobs in private sector STEM positions (498), private sector non-STEM positions (114), civilian government positions (52), the active military (44), high school teaching positions (82), and universities or colleges (84).

www.aip.org/statistics
Knowledge and Skills Regularly Used by Physics Bachelors Employed in the Private Sector, Classes of 2013 & 2014 Combined

Percentages represent the physics bachelors who chose "daily," "weekly," or "monthly" on a four-point scale that also included "never or rarely."

Figure based on the responses of 287 physics bachelors employed in private sector engineering positions and 215 physics bachelors employed in private sector computer science positions.

www.aip.org/statistics
Job Satisfaction vs Type of Employment (Bachelor Degree)

- Active Military: 88%
- Civilian and Government Labs: 90%
- High School Teaching: 90%
- Private Sector Non-Stem: 70%
- Private Sector Stem: 82%

Source: AIP Statistical Research Center
The SPS web site currently lists 200 jobs for Bachelor Degree Physicists.

http://jobs.spsnational.org/jobs/
Experience

* Do you have equipment experience
* Do you know how to think on your own
* Can you think outside the box
  * How do I get this experience while I am in school?
    * 310 & 320 Lab Courses
    * Student Faculty Research Project

What do employers look for?
Strong References:
* Research Advisor
* Teachers
* Employers (if you have worked while in school)

How do I get good references?
* Of course work hard but
* Just as important get to know us and let us get to know you.

What do employers look for?
**Good writing skills:**

* This is a must, you will be writing all the time!
* How do I get these,
  * Practice, Practice, Practice
  * If you can’t write well, get help now while you are here.
    * Use the University Writing Center.
    * Take a writing course.
    * Practice, Practice, Practice

**What do employers look for?**
*Good GPA

* Experience and a good work ethic will carry you a long way
  * But the better your GPA the better your chances for a good job.
* An excellent GPA may not be essential but “it can’t hurt”
* A weak GPA will hurt!

*What do employers look for?
Thank You

Questions?