There's bipartisan consensus: America's free market economy relies heavily upon federally-supported scientific & engineering research (R&D). R&D provides the basis for our economic and technological might. Most agree that the U.S. needs to live within its means, cut the federal deficit and do it the smart way — through technology-based economic growth.

A National Science Foundation (NSF) study found that 73% of the scientific papers cited in commercial patents were funded by taxpayers through the federal government, especially university research operations. Georgia received $290 million in federal R&D contracts in FY 2014, with approximately 1,226 transactions taking place. Georgia universities and colleges received $1.7 billion in federal R&D spending, including grants, in FY 2012, the latest year available from NSF.

Key Reports and On-Line Resources

• The Science-Engineering-Technology Working Group (SETWG) has sponsored the annual STEM on the Hill Congressional Visits Day Program since 1995. See www.setcvd.org

• Science & Engineering Indicators 2014, published by the National Science Board, provides a broad base of quantitative information on the U.S. and international science and engineering enterprise. It is created biennially by the National Science Foundation’s Division of Science Resources Statistics (SRS). See www.nsf.gov/statistics/seind14/

• ASTRA’s Web Sites include www.usinnovation.org. See also store.usinnovation.org for free downloads of all ASTRA State STEM Report Cards, the ASTRA 2015 National & State STEM Census, the ASTRA EdTech Revolution in Education book and all of our latest publications, videos and reports from the field.

• The American Academy of Arts & Sciences published Restoring the Foundation: the Vital Role of Research in Preserving the American Dream in September 2014. See www.amacad.org/content/Research/research-project.aspx?id=1276

What's in this 2015 STEM & Innovation Report Card?

A Call to Action for Georgia ................................................................. p.1
What does “STEM” Mean? .............................................................. p.1
U.S. R&D Spending in Georgia and Globally ................................ p.1
Top Federal R&D Agencies in Georgia FY 2014 .............................. p.1
Student STEM Interest in Georgia by Ethnicity & Gender from MyCollegeOptions ......................................................... p.2
Georgia's Fastest Growing STEM Jobs in 2014 .............................. p.3
Student Interest in STEM Jobs Increasing Nationwide ................ p.4
Why STEM Diversity & Equity Matter (NACME) ......................... pp. 5-6

CAUSE FOR ALARM: U.S. R&D Investment Declining—
China / BRICS Rising Rapidly & Overtaking U.S.4

Declining Support: Federal R&D Outlays as Percentage of Federal Budget 1962-2015 6:

1. Department of Defense $741,000,000
2. Health & Human Services $370,000,000
3. Environmental Protection Agency $40,000,000
4. NASA $23,000,000
5. Department of Justice $19,000,000

Shaping the Future: Georgia Students’ Interest in STEM Jobs 2015

Georgia High School Students’ Interest in STEM Careers: Class of 2016 by Gender & Ethnicity

Keeping STEM students from dropping out of the STEM Talent Pipeline is essential in meeting U.S. STEM Job demands for the future. The Charts on this page represent Georgia’s portion of an in-depth nationwide look at more than 6 million high school students in the MyCollegeOptions® program in 2015. Overall, U.S. students’ college major/career aspirations were used to determine their interest in STEM-related fields. The survey reveals that nationwide, nearly 30% — more than 1.6 million students — would like to pursue STEM careers in their futures. See how Georgia compares below.

7. Source: MyCollegeOptions.org® — for more information e-mail shapingthefuture@mycollegeoptions.org

<table>
<thead>
<tr>
<th>Grad Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>35.7%</td>
<td>14.2%</td>
</tr>
<tr>
<td>2008</td>
<td>35.9%</td>
<td>15.2%</td>
</tr>
<tr>
<td>2009</td>
<td>35.7%</td>
<td>16.3%</td>
</tr>
<tr>
<td>2010</td>
<td>35.1%</td>
<td>16.0%</td>
</tr>
<tr>
<td>2011</td>
<td>37.0%</td>
<td>16.4%</td>
</tr>
<tr>
<td>2012</td>
<td>38.1%</td>
<td>16.5%</td>
</tr>
<tr>
<td>2013</td>
<td>37.7%</td>
<td>15.0%</td>
</tr>
<tr>
<td>2014</td>
<td>40.6%</td>
<td>15.0%</td>
</tr>
<tr>
<td>2015</td>
<td>41.9%</td>
<td>14.5%</td>
</tr>
<tr>
<td>2016</td>
<td>43.7%</td>
<td>13.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grad Year</th>
<th>American Indian</th>
<th>Asian American</th>
<th>African American</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>26.5%</td>
<td>33.6%</td>
<td>24.6%</td>
<td>27.3%</td>
<td>26.3%</td>
</tr>
<tr>
<td>2008</td>
<td>25.8%</td>
<td>32.4%</td>
<td>24.5%</td>
<td>25.0%</td>
<td>25.9%</td>
</tr>
<tr>
<td>2009</td>
<td>28.9%</td>
<td>33.3%</td>
<td>25.3%</td>
<td>25.6%</td>
<td>26.4%</td>
</tr>
<tr>
<td>2010</td>
<td>26.1%</td>
<td>33.7%</td>
<td>24.6%</td>
<td>25.0%</td>
<td>25.8%</td>
</tr>
<tr>
<td>2011</td>
<td>27.8%</td>
<td>31.9%</td>
<td>24.7%</td>
<td>26.4%</td>
<td>26.5%</td>
</tr>
<tr>
<td>2012</td>
<td>27.9%</td>
<td>33.1%</td>
<td>24.9%</td>
<td>25.9%</td>
<td>28.0%</td>
</tr>
<tr>
<td>2013</td>
<td>27.3%</td>
<td>33.0%</td>
<td>23.2%</td>
<td>24.9%</td>
<td>27.6%</td>
</tr>
<tr>
<td>2014</td>
<td>30.7%</td>
<td>34.6%</td>
<td>23.5%</td>
<td>26.9%</td>
<td>29.1%</td>
</tr>
<tr>
<td>2015</td>
<td>29.3%</td>
<td>35.2%</td>
<td>23.9%</td>
<td>27.5%</td>
<td>30.1%</td>
</tr>
<tr>
<td>2016</td>
<td>29.0%</td>
<td>34.1%</td>
<td>23.3%</td>
<td>27.1%</td>
<td>30.6%</td>
</tr>
</tbody>
</table>
Georgia’s Future: Top 40 STEM Jobs in 2024

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-2011</td>
<td>Accountants and Auditors</td>
<td>56,330</td>
<td>64,033</td>
<td>7,703</td>
<td>14%</td>
<td>$32.26</td>
</tr>
<tr>
<td>2</td>
<td>11-9199</td>
<td>Managers, All Other</td>
<td>52,730</td>
<td>62,130</td>
<td>9,400</td>
<td>18%</td>
<td>$21.03</td>
</tr>
<tr>
<td>3</td>
<td>25-1099</td>
<td>Postsecondary Teachers</td>
<td>44,679</td>
<td>53,747</td>
<td>9,068</td>
<td>20%</td>
<td>$28.85</td>
</tr>
<tr>
<td>4</td>
<td>13-1199</td>
<td>Business Operations Specialists, All Other</td>
<td>35,875</td>
<td>37,936</td>
<td>2,061</td>
<td>6%</td>
<td>$33.74</td>
</tr>
<tr>
<td>5</td>
<td>49-3023</td>
<td>Automotive Service Technicians and Mechanics</td>
<td>32,963</td>
<td>37,698</td>
<td>4,735</td>
<td>14%</td>
<td>$15.10</td>
</tr>
<tr>
<td>6</td>
<td>35-1012</td>
<td>First-Line Supervisors of Food Prep. &amp; Serving Workers</td>
<td>32,337</td>
<td>37,060</td>
<td>4,723</td>
<td>15%</td>
<td>$13.29</td>
</tr>
<tr>
<td>7</td>
<td>35-2012</td>
<td>Cooks, Institution and Cafeteria</td>
<td>22,415</td>
<td>25,093</td>
<td>2,678</td>
<td>12%</td>
<td>$9.43</td>
</tr>
<tr>
<td>8</td>
<td>27-1024</td>
<td>Graphic Designers</td>
<td>12,821</td>
<td>14,395</td>
<td>1,574</td>
<td>12%</td>
<td>$19.96</td>
</tr>
<tr>
<td>9</td>
<td>11-3021</td>
<td>Computer and Information Systems Managers</td>
<td>12,051</td>
<td>13,749</td>
<td>1,698</td>
<td>14%</td>
<td>$57.91</td>
</tr>
<tr>
<td>10</td>
<td>11-9021</td>
<td>Construction Managers</td>
<td>14,754</td>
<td>13,385</td>
<td>(1,369)</td>
<td>(9%)</td>
<td>$23.38</td>
</tr>
<tr>
<td>11</td>
<td>19-3031</td>
<td>Clinical, Counseling, and School Psychologists</td>
<td>9,343</td>
<td>11,115</td>
<td>1,772</td>
<td>19%</td>
<td>$28.64</td>
</tr>
<tr>
<td>12</td>
<td>17-2051</td>
<td>Civil Engineers</td>
<td>7,814</td>
<td>8,953</td>
<td>1,139</td>
<td>15%</td>
<td>$39.68</td>
</tr>
<tr>
<td>13</td>
<td>49-3011</td>
<td>Aircraft Mechanics and Service Technicians</td>
<td>8,638</td>
<td>8,545</td>
<td>(93)</td>
<td>(1%)</td>
<td>$27.37</td>
</tr>
<tr>
<td>14</td>
<td>13-1041</td>
<td>Compliance Officers</td>
<td>7,626</td>
<td>8,124</td>
<td>498</td>
<td>7%</td>
<td>$28.37</td>
</tr>
<tr>
<td>15</td>
<td>13-2099</td>
<td>Financial Specialists, All Other</td>
<td>6,410</td>
<td>7,609</td>
<td>1,199</td>
<td>19%</td>
<td>$23.67</td>
</tr>
<tr>
<td>16</td>
<td>13-1051</td>
<td>Cost Estimators</td>
<td>5,811</td>
<td>6,772</td>
<td>961</td>
<td>17%</td>
<td>$28.21</td>
</tr>
<tr>
<td>17</td>
<td>17-2112</td>
<td>Industrial Engineers</td>
<td>6,003</td>
<td>6,427</td>
<td>424</td>
<td>7%</td>
<td>$39.14</td>
</tr>
<tr>
<td>18</td>
<td>17-2141</td>
<td>Mechanical Engineers</td>
<td>5,632</td>
<td>6,099</td>
<td>467</td>
<td>8%</td>
<td>$38.56</td>
</tr>
<tr>
<td>19</td>
<td>17-2072</td>
<td>Electronics Engineers, Except Computer</td>
<td>5,190</td>
<td>5,499</td>
<td>309</td>
<td>6%</td>
<td>$41.01</td>
</tr>
<tr>
<td>20</td>
<td>17-2071</td>
<td>Electrical Engineers</td>
<td>4,745</td>
<td>5,246</td>
<td>501</td>
<td>11%</td>
<td>$41.11</td>
</tr>
<tr>
<td>21</td>
<td>11-9041</td>
<td>Architectural and Engineering Managers</td>
<td>4,702</td>
<td>5,127</td>
<td>425</td>
<td>9%</td>
<td>$62.27</td>
</tr>
<tr>
<td>22</td>
<td>17-3023</td>
<td>Electrical and Electronics Engineering Technicians</td>
<td>4,851</td>
<td>4,942</td>
<td>91</td>
<td>2%</td>
<td>$27.52</td>
</tr>
<tr>
<td>23</td>
<td>11-3051</td>
<td>Industrial Production Managers</td>
<td>4,435</td>
<td>4,623</td>
<td>188</td>
<td>4%</td>
<td>$42.43</td>
</tr>
<tr>
<td>24</td>
<td>17-1011</td>
<td>Architects, Except Landscape and Naval</td>
<td>3,985</td>
<td>4,072</td>
<td>87</td>
<td>2%</td>
<td>$31.38</td>
</tr>
<tr>
<td>25</td>
<td>17-2199</td>
<td>Engineers, All Other</td>
<td>3,515</td>
<td>3,867</td>
<td>352</td>
<td>10%</td>
<td>$35.95</td>
</tr>
<tr>
<td>26</td>
<td>45-4022</td>
<td>Logging Equipment Operators</td>
<td>3,762</td>
<td>3,701</td>
<td>(61)</td>
<td>(2%)</td>
<td>$14.35</td>
</tr>
<tr>
<td>27</td>
<td>29-1031</td>
<td>Dietitians and Nutritionists</td>
<td>2,549</td>
<td>3,088</td>
<td>539</td>
<td>21%</td>
<td>$24.85</td>
</tr>
<tr>
<td>28</td>
<td>51-3092</td>
<td>Food Batchmakers</td>
<td>2,634</td>
<td>2,780</td>
<td>146</td>
<td>6%</td>
<td>$13.89</td>
</tr>
<tr>
<td>29</td>
<td>15-2031</td>
<td>Operations Research Analysts</td>
<td>2,336</td>
<td>2,760</td>
<td>424</td>
<td>18%</td>
<td>$34.73</td>
</tr>
<tr>
<td>30</td>
<td>17-3011</td>
<td>Architectural and Civil Drafters</td>
<td>2,759</td>
<td>2,645</td>
<td>(114)</td>
<td>(4%)</td>
<td>$26.35</td>
</tr>
<tr>
<td>31</td>
<td>43-9111</td>
<td>Statistical Assistants</td>
<td>2,466</td>
<td>2,617</td>
<td>151</td>
<td>6%</td>
<td>$13.02</td>
</tr>
<tr>
<td>32</td>
<td>19-2041</td>
<td>Environmental Scientists &amp; Specialists, Including Health</td>
<td>2,017</td>
<td>2,250</td>
<td>233</td>
<td>12%</td>
<td>$27.21</td>
</tr>
<tr>
<td>33</td>
<td>17-2011</td>
<td>Aerospace Engineers</td>
<td>2,139</td>
<td>2,249</td>
<td>110</td>
<td>5%</td>
<td>$50.55</td>
</tr>
<tr>
<td>34</td>
<td>17-3022</td>
<td>Civil Engineering Technicians</td>
<td>1,931</td>
<td>1,988</td>
<td>57</td>
<td>3%</td>
<td>$22.19</td>
</tr>
<tr>
<td>35</td>
<td>17-2081</td>
<td>Environmental Engineers</td>
<td>1,759</td>
<td>1,924</td>
<td>165</td>
<td>9%</td>
<td>$36.34</td>
</tr>
<tr>
<td>36</td>
<td>17-2061</td>
<td>Computer Hardware Engineers</td>
<td>1,688</td>
<td>1,896</td>
<td>208</td>
<td>12%</td>
<td>$43.65</td>
</tr>
<tr>
<td>37</td>
<td>19-3039</td>
<td>Psychologists, All Other</td>
<td>1,585</td>
<td>1,882</td>
<td>297</td>
<td>19%</td>
<td>$34.48</td>
</tr>
<tr>
<td>38</td>
<td>51-9011</td>
<td>Chemical Equipment Operators and Tenders</td>
<td>1,956</td>
<td>1,881</td>
<td>(75)</td>
<td>(4%)</td>
<td>$19.92</td>
</tr>
<tr>
<td>39</td>
<td>11-9121</td>
<td>Natural Sciences Managers</td>
<td>1,724</td>
<td>1,747</td>
<td>23</td>
<td>1%</td>
<td>$60.83</td>
</tr>
<tr>
<td>40</td>
<td>19-2031</td>
<td>Chemists</td>
<td>1,473</td>
<td>1,554</td>
<td>81</td>
<td>5%</td>
<td>$37.01</td>
</tr>
</tbody>
</table>

8. Source: ASTRA's Global STEM & Innovation Data Project and EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns 2/01/15.

*SOC = Standard Occupational Classification
Good News: Student Interest in STEM Careers Increasing

The Charts on this page represent an in-depth nationwide look at the “STEM Interests” of more than 6 million high school students in the MyCollegeOptions® program in 2015 — and comparisons with past years. Students’ college major/career aspirations were used to determine their interest in STEM-related fields. Nearly 30% — more than 1.6 million students — say they would like to pursue STEM in their futures. Keeping such students from dropping out of the STEM Talent Pipeline is essential in meeting U.S. STEM workforce demands for the future. Do our schools and teachers have the capacities to do this?

7. Source: MyCollegeOptions.org® — for more information e-mail shapingthefuture@mycollegeoptions.org

STEM Interest by Graduation Year... Gender...

<table>
<thead>
<tr>
<th>Grad. Year</th>
<th>National Average</th>
<th>Grad. Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>41.2%</td>
<td>2007</td>
<td>41.2%</td>
<td>16.1%</td>
</tr>
<tr>
<td>2008</td>
<td>40.1%</td>
<td>2008</td>
<td>40.1%</td>
<td>15.7%</td>
</tr>
<tr>
<td>2009</td>
<td>39.3%</td>
<td>2009</td>
<td>39.3%</td>
<td>15.9%</td>
</tr>
<tr>
<td>2010</td>
<td>39.0%</td>
<td>2010</td>
<td>39.0%</td>
<td>15.6%</td>
</tr>
<tr>
<td>2011</td>
<td>40.4%</td>
<td>2011</td>
<td>40.4%</td>
<td>15.7%</td>
</tr>
<tr>
<td>2012</td>
<td>42.7%</td>
<td>2012</td>
<td>42.7%</td>
<td>16.3%</td>
</tr>
<tr>
<td>2013</td>
<td>42.0%</td>
<td>2013</td>
<td>42.0%</td>
<td>15.6%</td>
</tr>
<tr>
<td>2014</td>
<td>43.2%</td>
<td>2014</td>
<td>43.2%</td>
<td>13.6%</td>
</tr>
<tr>
<td>2015</td>
<td>44.9%</td>
<td>2015</td>
<td>44.9%</td>
<td>13.4%</td>
</tr>
</tbody>
</table>

STEM Interest by Self-Identified Ethnicity...

<table>
<thead>
<tr>
<th>Grad. Year</th>
<th>American Indian</th>
<th>Asian American</th>
<th>African American</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>30.1%</td>
<td>36.2%</td>
<td>28.8%</td>
<td>28.0%</td>
<td>29.6%</td>
</tr>
<tr>
<td>2008</td>
<td>31.1%</td>
<td>33.6%</td>
<td>27.4%</td>
<td>30.2%</td>
<td>28.1%</td>
</tr>
<tr>
<td>2009</td>
<td>30.3%</td>
<td>31.8%</td>
<td>28.1%</td>
<td>28.7%</td>
<td>27.9%</td>
</tr>
<tr>
<td>2010</td>
<td>29.2%</td>
<td>33.8%</td>
<td>27.1%</td>
<td>27.0%</td>
<td>27.5%</td>
</tr>
<tr>
<td>2011</td>
<td>29.4%</td>
<td>32.2%</td>
<td>26.4%</td>
<td>26.2%</td>
<td>28.2%</td>
</tr>
<tr>
<td>2012</td>
<td>32.1%</td>
<td>33.6%</td>
<td>27.3%</td>
<td>28.3%</td>
<td>29.6%</td>
</tr>
<tr>
<td>2013</td>
<td>32.0%</td>
<td>35.2%</td>
<td>27.7%</td>
<td>30.3%</td>
<td>29.5%</td>
</tr>
<tr>
<td>2014</td>
<td>30.3%</td>
<td>33.7%</td>
<td>24.2%</td>
<td>27.0%</td>
<td>29.0%</td>
</tr>
<tr>
<td>2015</td>
<td>31.7%</td>
<td>34.6%</td>
<td>25.1%</td>
<td>29.3%</td>
<td>30.0%</td>
</tr>
</tbody>
</table>

National Student Interest in STEM Careers Increasing:
Increasing the number of Underrepresented Minorities (URMs) in the U.S. STEM workforce would solve many of the skills gaps that confront our economy. Ethnic and gender disparities in STEM academic achievement carry over into lower participation by many URMs in high-paying STEM jobs. Selected data provided by the National Action Council for Minorities in Engineering, Inc. (NACME) help illustrate the challenge. For more information on URMs in engineering education and engineering careers, visit www.nacme.org/research-publications.

**Figure 1:** Changing Demographics of the U.S.¹

**Figure 2:** Percentage of Public and Private High School Graduates Taking Calculus Courses in High School,

**Figure 3:** Percentage of Students Meeting ACT College Readiness Benchmark Scores, 2014³

**Figure 4:** Engineering Bachelor’s Degrees Earned, 1977-2013⁴

---

Endnotes
The U.S. population is becoming more diverse each year. By 2050, URMs will represent more than 40 percent of the population, and there will be no majority race. The demand for qualified STEM professionals is high, but the supply of STEM workers to fill these positions is at risk if underrepresented groups are not engaged in these fields. The figures below show that African Americans, Latinos, American Indians, Alaska Natives, and women are underrepresented in all levels of engineering education and in the engineering workforce.

**Figure 5:** African Americans in Engineering

**Figure 6:** American Indian/Alaska Natives in Engineering

**Figure 7:** Latinos in Engineering

**Figure 8:** Women in Engineering


STEM on the Hill™ is powered by ASTRA data.