Department/Organization Information

<table>
<thead>
<tr>
<th>Department/Organization Name</th>
<th>Undergraduate Studies/Student Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Digit Department Number</td>
<td>Ujana Batocestova and Sharon McGuire</td>
</tr>
<tr>
<td>Contact Person</td>
<td></td>
</tr>
<tr>
<td>Phone Number</td>
<td>426-4002</td>
</tr>
</tbody>
</table>

FY 2014 Budget Overview

<table>
<thead>
<tr>
<th>Budgeted Revenue from Student Fees</th>
<th>Budgeted Revenue from Other Sources</th>
<th>Total 2014 Revenue Budget</th>
</tr>
</thead>
</table>

Current Fee Structure

- See attached schedule of 2014 Tuition & Fees

<table>
<thead>
<tr>
<th>Fee Structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Fee</td>
<td></td>
</tr>
<tr>
<td>Part-Time Fee</td>
<td></td>
</tr>
<tr>
<td>Summer Fee</td>
<td></td>
</tr>
</tbody>
</table>

Proposed Fee Increase

- See attached schedule of 2014 Tuition & Fees

<table>
<thead>
<tr>
<th>Fee Structure</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Fee</td>
<td>$5.00</td>
</tr>
<tr>
<td>Part-Time Fee</td>
<td>$0.50 credit hour</td>
</tr>
<tr>
<td>Summer Fee</td>
<td>$0.50 per credit hour</td>
</tr>
</tbody>
</table>

Describe the programs and services provided to the students of Boise State University by this Department/Organization.

The program aligns with strategic goals of creating a signature, high-quality educational experience, responding to community needs, and fostering a research culture. Student research is a "high impact" practice that increases persistence to graduation and contributes to the achievement of University Learning Outcomes such as critical thinking and innovation. Student Research Office adds value to existing units and projects on campus by streamlining processes, providing more opportunities for students, faculty and community to conduct research, cultivating additional external resources, and integrating with existing curricula e.g., Foundational Studies.

Describe additional programs and services that will be provided to the students of Boise State University due to this proposed fee change.

The research of Boise State is significantly expanded via student presentations at national and international conferences. We are better equipped to address community and industry needs by expanding research opportunities. Students, regardless of their major or post-graduation goals/plans will benefit from being engaged in the "research" curricula. The Office/fee will provide 50 fellowship stipends to conduct research and 70 travel awards to present at conferences. The director and staff will offer workshops, resource information, advocate for funding and collaborate with appropriate units and agencies.

Justification of this proposed fee increase to students - Dean/VP approval necessary

Students directly benefit from the programs and services offered through the Student Research Office. Opportunities for student research, formally and informally, are limited due to funding and faculty support. This program will not only provide experiences for students to build skills, the program will enhance the value of the degree and increase student's likelihood of persistence.

See attached
# Boise State University

## Student Tuition/Fee Rate Request

**Effective 2014-2015 Academic Year**

### Department/Organization Information

<table>
<thead>
<tr>
<th>Department/Organization Name</th>
<th>Undergraduate Studies/ Student Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Digit Department Number</td>
<td>426-4062</td>
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### FY 2014 Budget Overview

<table>
<thead>
<tr>
<th>Budgeted Revenue from Student Fees</th>
<th>Budgeted Revenue from Other Sources</th>
<th>Total 2014 Revenue Budget</th>
</tr>
</thead>
</table>

### Current Fee Structure

---

**See attached schedule of 2014 Tuition & Fees**

<table>
<thead>
<tr>
<th>Fee Type</th>
<th>Fee Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Fee</td>
<td>$5.00</td>
</tr>
<tr>
<td>Part-Time Fee</td>
<td>$.50 credit hour</td>
</tr>
<tr>
<td>Summer Fee</td>
<td>$.50 per credit hour</td>
</tr>
</tbody>
</table>

### Proposed Fee Increase

---

<table>
<thead>
<tr>
<th>Fee Type</th>
<th>Proposed Fee Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Fee</td>
<td>$5.00</td>
</tr>
<tr>
<td>Part-Time Fee</td>
<td>$.50 credit hour</td>
</tr>
<tr>
<td>Summer Fee</td>
<td>$.50 per credit hour</td>
</tr>
</tbody>
</table>

### Justification of this proposed fee increase to students -Dean/VP approval necessary

Students directly benefit from the programs and services offered through the Student Research Office. Opportunities for student research, formally and informally, are limited due to funding and faculty support. This program will not only provide experiences for students to build skills, the program will enhance the value of the degree and increase student’s likelihood of persistence.

---

For use by Committee

DEAN/VP Approval Confirmed ________________

---
ADDITIONAL REVENUE FROM **ENROLLMENT GROWTH ONLY**

<table>
<thead>
<tr>
<th>Initial Estimates for FY 14</th>
<th>Head Count/Credits</th>
<th>Current Semester Fee</th>
<th>Estimated Fee Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Count (13+ credits)</td>
<td>26,652</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Credits at Per Credit Rate (1-12 credits)</td>
<td>60,890</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Summer Credits</td>
<td>30,795</td>
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<td></td>
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<td></td>
<td><strong>$0.00</strong></td>
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</table>

Less 2% estimate for outstanding fees, credit card charges, adjustments etc.

<table>
<thead>
<tr>
<th>Revised Estimates for FY 14</th>
<th>Head Count/Credits</th>
<th>Current Semester Fee</th>
<th>Estimated Fee Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Count (13+ credits)</td>
<td>19,038</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Credits at Per Credit Rate (1-12 credits)</td>
<td>139,580</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Summer Credits</td>
<td>27,282</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$0.00</strong></td>
</tr>
</tbody>
</table>

Less 2% estimate for outstanding fees, credit card charges, adjustments etc.

<table>
<thead>
<tr>
<th>Enrollment Estimates for FY 15</th>
<th>No Change in Pricing Structure</th>
<th>Head Count (14+ credits)</th>
<th>$0.00</th>
<th>$0.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits at Per Credit Rate (1-13 credits)</td>
<td>139,580</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Summer Credits</td>
<td>27,282</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$0.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

Less 2% estimate for outstanding fees, credit card charges, adjustments etc.

**Estimated FY 2015 revenue change due to enrollment changes** $0.00

University forecast is for flat enrollment based on FY 2014 actual Summer and Fall, and projected Spring enrollments. Note the FY 2015 estimate is based on revised FY 2014 estimates. Depending on the pricing structure for each individual fee, most units will see slight increases in revenue estimates, and a few units will see a decrease, even though flat enrollments are forecasted.

ADDITIONAL REVENUE FROM **FEE INCREASE ONLY**

<table>
<thead>
<tr>
<th>Estimates for FY 15</th>
<th>CURRENT FY 2014</th>
<th>PROPOSED INCREASE AMOUNT FY 2015 Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Count (13+ credits)</td>
<td>19,038</td>
<td>$0.00</td>
</tr>
<tr>
<td>Credits at Per Credit Rate (1-12 credits)</td>
<td>139,580</td>
<td>$0.00</td>
</tr>
<tr>
<td>Summer Credits (revenue in FY 2016)</td>
<td>27,282</td>
<td>$0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Less 2% estimate for outstanding fees, credit card charges, adjustments etc.

**Estimated FY 2015 revenue change due to fee change** $161,680.40

**Estimated revenue change from BOTH enrollment change and proposed fee change** $161,680.40
### Boise State University
#### 2013-2014 Schedule of Tuition & Fees
**Effective Summer 2013, Fall 2013 and Spring 2014**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td><strong>General Ed Fees</strong></td>
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<tr>
<td>Tuition</td>
<td>$2,154.60</td>
<td>$2,154.60</td>
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<td></td>
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<tr>
<td>Part-Time Credit Hour Fee</td>
<td>$166.25</td>
<td>$166.25</td>
<td>$165.67</td>
<td>$165.67</td>
<td>$170.60</td>
<td>$170.60</td>
<td>$170.60</td>
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<td><strong>Facility and Technology Fees</strong></td>
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<td>General Building Fee</td>
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<td>Capital Expenditure Reserve Fee</td>
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<td>SUB Construction Fee</td>
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<td>2.70</td>
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<td>Facilities Fee</td>
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<td>23.70</td>
<td>21.60</td>
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<td>Health and Wellness Ctr. Facility Fee</td>
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<td>40.00</td>
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<td>Information Technology Fee</td>
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<td>9.45</td>
<td>9.45</td>
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<td><strong>Activity Fees</strong></td>
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<td>Intercollegiate Athletics</td>
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<td>10.75</td>
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<td>Student Health Center</td>
<td>37.50</td>
<td>37.50</td>
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<td>Student Union Operations</td>
<td>63.00</td>
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<td>6.40</td>
<td>6.40</td>
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<td>6.90</td>
<td>6.90</td>
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<tr>
<td>Student Life</td>
<td>31.50</td>
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<td>3.35</td>
<td>3.35</td>
<td>3.35</td>
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<tr>
<td>Associated Student Body</td>
<td>12.00</td>
<td>12.00</td>
<td>1.65</td>
<td>1.65</td>
<td>1.28</td>
<td>1.65</td>
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<tr>
<td>University News</td>
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<td>0.40</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
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<tr>
<td>Student Programs Board</td>
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<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
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<tr>
<td>Campus Recreation</td>
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<td>45.75</td>
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<td>4.52</td>
<td>5.40</td>
<td>5.40</td>
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<tr>
<td>Theatre Arts</td>
<td>2.00</td>
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<td>0.30</td>
<td>0.30</td>
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<td>Alumni Activities</td>
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<td>Scholarships</td>
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<td>Children's Center</td>
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<td>0.70</td>
<td>0.70</td>
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<tr>
<td>Volunteer Services Board</td>
<td>1.90</td>
<td>1.90</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Marching Band</td>
<td>11.15</td>
<td>11.15</td>
<td>1.30</td>
<td>1.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Diversity and Inclusion</td>
<td>4.50</td>
<td>4.50</td>
<td>0.38</td>
<td>0.38</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
</tr>
<tr>
<td>Career Center</td>
<td>2.50</td>
<td>2.50</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Spirit Squad</td>
<td>4.50</td>
<td>4.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Fees</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Fee</td>
<td>570.00</td>
<td>64.00</td>
<td>60.00</td>
<td>64.00</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Total Tuition and Fees-Resident Student</strong></td>
<td>$3,146.00</td>
<td>$3,716.00</td>
<td>$260.00</td>
<td>$324.00</td>
<td>$245.00</td>
<td>$305.00</td>
<td>$252.00</td>
</tr>
</tbody>
</table>

#### Other Fees / Tuition

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Insurance</td>
<td>$1,060.00</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Non-resident Tuition</td>
<td>$6,300.00</td>
<td>TBD</td>
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<td></td>
<td></td>
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<tr>
<td>Non-resident Part-Time Fee per Credit</td>
<td>$112.00</td>
<td>TBD</td>
<td></td>
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<tr>
<td>Western Undergrad Exchange Fee</td>
<td>$1,573.00</td>
<td>TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Service Credit Hour Fee-Undergrad</td>
<td>$97.00</td>
<td>TBD</td>
<td></td>
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<tr>
<td>In-Service Credit Hour Fee-Graduate</td>
<td>$121.00</td>
<td>TBD</td>
<td></td>
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<td></td>
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<tr>
<td>Course Overload Credit Hour Fee</td>
<td>$166.00</td>
<td>TBD</td>
<td>part-time gen ed portion only</td>
<td>part-time gen ed portion only</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The State Board of Education policy states that students must provide proof of comparable health insurance or are required to maintain the university provided health coverage.

The full-time undergraduate fee is charged to undergraduate students taking 13 or more credit hours. The full-time graduate fee is charged to graduate students taking 9 or more credits. The part-time credit hour fee is charged to undergraduate students taking 12 or less credits and to graduate students taking 8 or less credits. For Summer, the part-time credit hour fee is charged regardless of the number of credits.

Non-Resident tuition/fees and Western Undergraduate Exchange fees are in addition to total resident fees.

All fees, tuition, and other charges are subject to change.
Boise State University
Plan Proposed New Student Fee
Department Name: Undergraduate Studies/Student Research Office
DeptID: 937L100001

<table>
<thead>
<tr>
<th>Proposed/Projected Budget</th>
</tr>
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<tbody>
<tr>
<td>FY15</td>
</tr>
</tbody>
</table>

### Revenues

<table>
<thead>
<tr>
<th>Revenue Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Fees</td>
<td>161,680</td>
</tr>
<tr>
<td>Private Gifts</td>
<td></td>
</tr>
<tr>
<td>Ticket Sales &amp; Event Revenue</td>
<td></td>
</tr>
<tr>
<td>Refund of Revenue</td>
<td></td>
</tr>
<tr>
<td>Sales &amp; Service Revenue</td>
<td></td>
</tr>
<tr>
<td>Facility Usage &amp; Rent Revenue</td>
<td></td>
</tr>
<tr>
<td>Advertising &amp; Promotions Revenue</td>
<td></td>
</tr>
<tr>
<td>Other Revenue</td>
<td></td>
</tr>
</tbody>
</table>

**Total Revenue** 161,680

### Expenses

<table>
<thead>
<tr>
<th>Expense Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees - Program Director</td>
<td>25,000</td>
</tr>
<tr>
<td>Administrative Staff</td>
<td>1,000</td>
</tr>
<tr>
<td>Employees - Temporary (Graduate Assistant)</td>
<td>23,000</td>
</tr>
<tr>
<td>Students - Fellowship Stipends</td>
<td>70,000</td>
</tr>
<tr>
<td>Benefits</td>
<td>5,966</td>
</tr>
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</table>

**Total Salaries & Benefits** 124,966

**Total Travel**

**Total Other Expense** - Research Expenses ($5,000) 35,500

<table>
<thead>
<tr>
<th>Expense</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies ($2,500)</td>
<td></td>
</tr>
<tr>
<td>Travel Awards ($28,000)</td>
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</table>

**Total Expense** 160,466

### Fund Balance Summary

<table>
<thead>
<tr>
<th>Surplus (Deficit)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfers</td>
<td></td>
</tr>
<tr>
<td>Prior Year Balance Forward</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total PY Balance Forward and Transfers**

| Period Net Income (Loss)      | 1,214    |
| End of Period Fund Balance    | 1,214    |
INSTITUTIONALIZING STUDENT RESEARCH
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Summer Research Community........................................................................................................................................9

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EXECUTIVE SUMMARY

As Boise State University pursues its mission as a public metropolitan research university, we recognize the need to develop infrastructure that will support achieving its strategic goals. We have an opportunity to develop a transformative component of such infrastructure that implements several strategies from Boise State University’s strategic plan: Authentic Research Experiences for Students (ARES).

Student research experiences, integrated into the curriculum, and associated training will address each stage of the research process, leading to improved competencies in several University Learning Outcomes (ULOs) including communication skills (ULO 1, 2), critical thinking (ULO 3), innovation and teamwork (ULO 4), research ethics (ULO 5) and interdisciplinarity (ULO 7-11). This aligns with the strategic goal of creating a signature, high-quality educational experience, responding to community needs and fostering a research culture.

Moreover, student research will equip traditional and non-traditional students with skills supporting life-long learning, enabling them to successfully compete in a changing 21st Century world. Through participation in research projects, research based courses and a growing number of interdisciplinary research opportunities, students will learn how to manage projects and work collaboratively. Engaging students in active learning while building mentoring relationships with faculty will not only positively impact student recruitment and retention, these activities will also influence the faculty culture of integration teaching and research. This aligns with the Boise State strategic goals of facilitating the timely attainment of educational goals of our diverse student population and fosters a culture that supports distinction as a doctoral research university.

The Student Research Office (SRO) will be established to realize this infrastructure. The SRO will serve students, faculty, staff and the community by providing strategic leadership and support towards advancing student research across the university, awarding fellowships and travel grants, generating information, serving as liaison and enhancing the awareness and integration of student research more broadly. Six strategic goals will guide the Student Research Office in meeting its mission:

**GOAL 1.** Expand and coordinate the institutional support for student research.
**GOAL 2.** Promote the inclusion of research and creative or inquiry-based projects as a component of the curriculum in all degree programs.
**GOAL 3.** Provide activities to train and support students and faculty engaged in collaborative work.
**GOAL 4.** Establish procedures to track, celebrate and assess the impact of student participation in research, inquiry and creative work.
**GOAL 5.** Expand external funding for undergraduate research and develop mechanisms to increase financial support for student research.
**GOAL 6.** Facilitate access of business, industry and the community to student researchers with the appropriate competencies.

* Please note research is an inclusive term referring to ARES.
There is an existing foundation for SRO on which to build. In Fall 2012, Boise State launched the Student Research Initiative program. The mission of this pilot program is to facilitate and increase student research as a means of engaged learning, critical thinking, and the creation of knowledge. The funds ($123,000) for this program were provided Office of Research and Economic Development. These funds supported 29 fellows, 48 travel awards and infrastructure enhancements (e.g. website and brochures).

In 2013 the program organized 9 cohort meetings (used as venues for student research dissemination), 3 professional development workshops (“How to prepare competitive research application”, Student Research Panel and “Research Methods” workshop for high school students) and a Summer Undergraduate Research Conference.

There is great momentum for student research and we are committed to delivering its significant value to our students and convinced that it will transform their educational experience at Boise State University.
DEFINITION OF RESEARCH

Research is a systematic inquiry or investigation into a subject in order to discover new facts or principles, and increase the sum of knowledge enhance design or enrich artistic ability.

BENEFITS OF STUDENT RESEARCH

The involvement of students in collaborative research, scholarship and creative activity with faculty members is a proven and powerful practice in view of the many educational benefits gained by students, the professional rewards accorded to faculty mentors, and the contributions provided to the wider research community. In particular, undergraduate research has gained strong national prominence as an effective educational strategy and is one of the high-impact educational practices that increase the rates of student retention and engagement (Kuh, 2008).

The American Association of American Universities found that undergraduate research experience "helps [students] develop critical thinking skills, the ability to work with ambiguity of open-ended questions, an ability to apply skepticism to the daily flow of information and an appreciation of what it takes to create new knowledge" (Merkel, 2001). Moreover, students engaged in undergraduate research report that they are better able to think analytically and logically and are able to make better use of the primary literature, formulate research hypotheses, interpret data, and communicate the results of research (Ishiyama, 2011; Lopatto, 2004; Seymour, 2004). Student researchers often disseminate their work at professional meetings or submit their work for publication in academic journals. These experiences expose the students to the rigors of the peer-review process, which help to ensure the validity and originality of work. As a result, students have a greater understanding of the value of reviewed work and perhaps learn to look more critically at their own work. Moreover, student researchers are able to make better use of the primary literature, formulate research hypotheses, interpret data and communicate the results of research (Kardash, 2000). These experiences expose the student researchers to the rigors of the peer-review process, which help to ensure the originality of research (Brown, 2005).
Thus, focusing on undergraduate research would allow us to apply a proven method to improve and enhance the quality of learning at Boise State and is a prime example of the “highly personalized, engaging and progressively developmental academic and co-curricular programs predicated on national standards of excellence” (Bauer and Bennett, 2003) that would distinguish our campus. Four student scholarly activities will guide the Student Research Office in achieving a success.

SUCCESSFUL STUDENT SCHOLARLY ACTIVITIES

All forms of student research, and creative activity are characterized by four unifying features: mentorship, originality, acceptability and dissemination:

1. **Mentorship**: Mentorship involves a collaborative interaction between the faculty mentor and the student, in which the student is intellectually engaged in a research project. The faculty mentor guides the student into deeper intellectual engagement. The faculty mentor is focused on the student’s development and on the results or products of the research project.

2. **Originality**: The student needs to make a meaningful and authentic contribution to the research project and the work must be entirely or partially novel.

3. **Acceptability**: The student’s work should employ techniques and methodologies that are both appropriate and recognized in the discipline.

4. **Dissemination**: There needs to be a final product for which both the process and results are critiqued, judged or peer-reviewed.

WHERE WE WERE

In Fall 2010, the Task Force for Student Research (TFSR) met with various university officials to entertain the possibility of pursuing an activity-fee funded program for student-produced scholarly works within their respective disciplines. The concept was greeted with approval and the Task Force for Student Research was formulated shortly thereafter to begin the process of establishing a program. The TFSR was created by the Associated Students of Boise State University (ASBSU) and the following offices and constituencies were represented in its membership: ASBSU, the Student Body at-large, the Provost’s Office, the Office of the Vice President for Research, the Graduate College, the Office of Student Affairs, the library and the faculty.

In Spring 2011 TSFR conducted a survey to explore the feasibility of creating a student activity fee
funded program. Of the surveyed students, 383 students (38%) volunteered an amount above $11/semester, 367 students (36%) volunteered an amount between $5 and $10, and 268 students (26%) volunteered less than $5 for a fee for student research. These results showed that 74% of the surveyed students were willing to pay at least $5. However, as it was a pilot program, the decision was made to initially fund it without student fees. The initial funding for the program came from the Office of the Vice President for Research and Economic Development. The program was launched in Fall 2012 under the name Student Research Initiative (SRI) Program. The program offers fellowships and travel awards. The SRI website is hosted by the Office of Undergraduate Studies.

The Student Research Initiative (SRI) Fellowship Program provides funded opportunities for Boise State University students to pursue independent academic and creative work and engage in research and scholarship under the supervision of a faculty mentor. The program is open to both undergraduate and graduate degree-seeking students in all academic disciplines. The mission of the program is to facilitate and increase student research as a means of engaged learning, critical thinking, and the creation of knowledge. The goals of the program are to foster and expand student research at Boise State University by increasing the number of students from all disciplines that participate in research, to increase the number of publications and presentations from research, and to ensure content/skill mastery while promoting interdisciplinary socialization. The program has awarded 29 fellowships. A summary of the SRI January – August 2013 report is available in Appendix A.

The Student Research Initiative (SRI) Travel Award Program provides students with the opportunity to apply for funding to assist in presenting research results or perform productions at national conferences or meetings. The program is open to both undergraduate and graduate degree-seeking students from all academic disciplines. The program awarded 48 travel awards and the students presented to over 36 professional national and 2 international conferences.

During the period January – August 2013 the SRI Program organized:

- Eight SRI cohort meetings (used as venues for student research dissemination)
- Three professional development workshops (“How to prepare competitive research application”, Student Research Panel and “Research Methods” workshop for high school students).

In addition, the SRI program founded the Annual Boise State Graduate Symposium and chaired the organizing committee of the 3rd Boise State Summer Undergraduate Research Conference.
During the Spring 2011 semester, representatives of several undergraduate summer research programs began meeting to discuss common concerns, plan for hosting joint workshops and seminars and social events. This group, which named itself the *Summer Research Community*, consists of a number of undergraduate research programs. Partners include the NSF funded Research Experience for Undergraduates program in Mathematics and Chemistry, NIH IDeA Network for Biomedical Research Excellence (INBRE), Idaho NSF EPSCoR, NSF Louis Stokes Alliance for Minority Participation (LSAMP), McNair Scholars program and the Student Research Initiative (SRI) program. Currently, the Summer Research Community is a mosaic of undergraduate research programs that engage more than 90 students from Boise State and other national and international universities. These programs collectively develop undergraduate students into research scholars and enhance student success towards the pursuit of graduate degrees and academic/industry careers. Each summer the SRC organizes *six joint seminars* (e.g., Applying to Graduate School, Presenting Research to the Public - “Messenger of Science” workshop, Presenting a Poster, Responsible Conduct of Research, Interdisciplinary Seminar); *six social events* (e.g., River Rafting, evening at the Discovery Center, Picnic, etc) and hosts invited speakers. Currently, the information about the SRC is available at [http://stem.boisestate.edu/stem-summer](http://stem.boisestate.edu/stem-summer). The SRI program is involved in all aspects of planning and activities of the Summer Research Community.

“One program is engaging, challenging, and rigorous. I really cannot express in words how thankful I am for this program and just how surprised I am by the experience. I’ve learned so much, and I’ve had such wonderful intellectual conversations with my peers.”

One of the distinctions of the Summer Research Community is the *Summer Undergraduate Research Conference* (SURC), which was founded in Summer 2011. More than 120 undergraduate students of diverse backgrounds and disciplines gathered at SURC 2013 and presented the results of their original work in poster presentations to faculty, the public and their peers from across the country. The organizing committee of SURC 2013 was chaired by the director of the SRI/MATH REU program. In the past two years the conference was generously supported by the Dean’s Office of the College of Arts and Science and several undergraduate research programs.
With centralized office, the Summer Research Community will be able to take new collaborative initiatives more effectively. For example, plan is underway for expanding SURC into a statewide conference that will engage undergraduate students from all disciplines, faculty, K-12 teachers and high school students and the whole community. The information about SURC 2014 is available at the website of Undergraduate Studies.

In Fall 2013 the SRI program started developing a new website that will act as Virtual Office of Student Research (more details about the website are presented in the next section). Also, in Fall 2013 the SRI program initiated the process of introducing a university-wide course number for undergraduate research. This is an ongoing work.

However, we must recognize that we still have very limited student and faculty awareness of research activities on campus. We expect that with centralized office for student research this gap will be significantly reduced.

WHERE WE ARE GOING: MISSION AND GOALS

The Office of Student Research will provide strategic leadership for advancing student research across the university, generating information, serving as liaison and enhancing the awareness of developments around student research.

GOAL 1. Expand and coordinate the institutional support for student research

The goal would be met by creating developmental activities to support the student learning objectives such as workshops, student presentations, on-campus symposia and conferences and coordinating efforts and resources among existing campus programs (e.g., the Honors College, the McNair Scholars Program, the NSF and NIH funded REU programs). The Office of Student Research would also be responsible for broadening faculty mentor representation from more disciplines, especially those previously underrepresented in undergraduate research and from all academic colleges. The Office of Student Research, in collaboration with Service Learning, will promote community-based research and develop faculty-student collaborations that are designed to enhance academic opportunities for public engagement. When a university, such as Boise State, is a host to a number of summer programs, coordination and collaboration among programs is a necessity. With centralized office support, Boise State could be better positioned to develop the existing structure of coordination and collaboration among these programs.
By generating awareness, we hope to increase the number of students engaged in research and scholarly or creative projects at Boise State. The goal will be met by founding a Student Research Council (SRC). The student members of the council will promote awareness about undergraduate and graduate research opportunities at Boise State. The members will attend monthly meetings, promote student research at workshops, speaking engagements and class presentations, work as a team to strengthen and expand student research awareness at Boise State, provide assistance at the two annual conferences on undergraduate research and at the graduate symposium.

A fully developed website is critical for creating a campus culture supportive to student research. The development of such a website is in progress. The Student Research website, to be launched soon, will function as follows: The website will act as a Virtual Office of Student Research; the site will answer questions around the goals of student research, the role of student research, links to research opportunities, promotion of interdisciplinary and community-based student research, student research recruiting by listing faculty and their research interests, links to the “celebration days” of undergraduate research, etc.

**GOAL 2. Promote the inclusion of research and creative or inquiry-based projects as a component of the curriculum in all degree programs**

We argue that a well-conceived strategic process for integrating student research into the curriculum will help the faculty envision teaching, research and service as one. The goal will be met by enhancing existing courses and creating a new course(s) in a university-wide effort to develop curriculum that incorporates research and inquiry into the classroom. The development of a mechanism to award course credit to students for participating in undergraduate research is underway. In addition, the Student Research Office in collaboration with various departments, institutes and programs will develop mechanisms to identify and recruit undergraduate researchers early in their careers. All students begin with University Foundations (UF) 100/300, core building blocks of our new Foundational Studies Program, which focuses on the learning outcomes of critical inquiry, innovation, team work and communication. Engaging UF 100/300 students in the research process is essential to achieving these intended learning outcomes. An experiential component is a requirement of the UF 200 course that all sophomore students enroll in. Currently, UF 200 instructors rely on Service Learning, Student Leadership and Involvement Center, simulations, community-engagement projects, and their own networks to engage students in “experiential learning”.
Building on this two-course base, students can seek discipline based opportunities to deepen their research experience via the Student Research Fellowships, research-based group projects and community-based projects. The Finishing Foundations course required in each major integrates and applies the student's past experiences. Students document and reflect upon their research experience and other learning experiences via their E-Portfolio that can be shared with future employers.

**GOAL 3. Provide activities to train and support students and faculty engaged in collaborative work**

Discussing mentoring issues with colleagues are essential to providing a successful student research experience. Graduate students and postdoctoral fellows play a significant role in mentoring undergraduate researchers. Goal 2 would be met by offering and encouraging faculty, graduate students and postdoctoral fellows to attend professional development workshops (e.g., incorporating research into an undergraduate course; becoming an honors thesis mentor) on mentoring and leadership.

**GOAL 4. Establish procedures to track, celebrate and assess the impact of student participation in research, inquiry and creative work.**

The goal will be met by offering a wide array of opportunities to (undergraduate and graduate) students to present their research. Boise State already provides a foundation upon which to build these opportunities. The Boise State Conference on Undergraduate Research and Scholarship and the Summer Undergraduate Research Conference are a solid foundation for developing a statewide undergraduate research conference. The conference will provide an interactive forum for students and faculty from all disciplines and colleges and universities in the state to showcase their research, scholarly and creative work through poster presentations. In addition, the conference will provide various professional development workshops for high school students and K-12 teachers. With centralized office support, Boise State would be better prepared to sponsor such a conference focused on undergraduate research. Also, a centralized office in collaboration with the Graduate College could develop a campus-wide graduate research symposium. The Student Research Office will employ a variety of methods (e-mail, attendance at workshops where students present, faculty contacts and social networking sites) to track students’ success. The centralized office in collaboration with offices across campus will undertake serious efforts aimed at developing an evaluation methodology for measuring student learning and related outcomes of student research.
GOAL 5. Expand external funding for undergraduate research and develop mechanisms to increase financial support for student research

External funding is essential for the development of a rich, productive and cutting-edge faculty-student research environment. A centralized office will strengthen the partnership between faculty form different undergraduate research programs on campus in seeking external funding that will sustain their research programs and infrastructure over the long term. Examples at the federal level include the National Science Foundation’s Research in Undergraduate Institutions (RUI) and Research Experiences for Undergraduates (REU) programs, as well as the National Institutes of Health’s Academic Research Enhancement Awards (AREA, or R15). Examples of private foundations include, e.g., the Research Corporation for Science Advancement, the American Chemical Society Petroleum Research Fund and the Camille and Henry Dreyfus Foundation.

GOAL 6. Facilitate access of business, industry and the community to student researchers with the appropriate competencies.

The Student Research Office/Program and its goals of fostering critical thinking skills, providing experience to “creating knowledge” are in direct alignment with the competencies that industry partners and employers are looking for in college graduates.

By having a formal structure to implement research experiences (inclusive of community-based projects and creative activity), the business, industry, and civic communities will have more effective and efficient opportunities to support and access these programs. By partnering with the Division of Research and Economic Development, there will be a conduit to understand the needs and determine the ways in which student research may address those needs.

ASSESSMENT PLAN

The assessment plan will be designed to optimally assess the effectiveness of the Student Research Office Logic Model presented in Appendix A. As a new and growing program we will conduct formative/process evaluations and summative/outcome evaluations. The program assessment will take two forms:

1. Mentors’ and students’ written assessments. Students and mentors complete evaluations at the end of each semester and at the end of the summer. Students evaluate their learning and mentors provide an assessment of students’ effort, learning and ability to collaborate.
2. **Survey of Undergraduate Research Experience (SURE).** Students will participate in the national SURE survey (Preflection, the SURE III and the Follow Up survey). They will complete a self-assessment of their learning gains. This data will be compared to the self-reported data from students in undergraduate research programs nationwide. This will allow us to compare the effectiveness of our program with similar programs. The SURE survey is free and open to all. Access to all three SURE surveys is available at [https://www.grinnell.edu/academics/areas/psychology/assessnebts/sure-iii-survey](https://www.grinnell.edu/academics/areas/psychology/assessnebts/sure-iii-survey). We will also use VALUE rubrics available at the website of the Association of American Universities Colleges ([http://www.aacu.org/value/rubrics/InquiryAnalysis.cfm](http://www.aacu.org/value/rubrics/InquiryAnalysis.cfm)). The VALUE rubrics were developed by a team of faculty experts representing colleges and universities across the United States.

3. **Publications and Presentations.** Publications and presentations are an indication of the students’ scientific productivity. This information will be collected from both students and mentors via online evaluations.

4. **Tracking participants’ career paths.** By employing a variety of methods (e-mail, attendance at workshops where students presented, faculty contacts and social networking sites) we will track students’ post-baccalaureate activities and survey alumni to understand the impact of undergraduate research on their career paths.

5. **Faculty mentors and funding agencies.** One important indication of how successful is a student research program/office is, is the number of faculty involved in engaging students in research. Also, renewal of grants that support student research is another indicator of the program/office’s success. This information will be used in the evaluation of the students research program/office.

**THE STUDENT RESEARCH OFFICE, ADMINISTRATION AND STAFFING**

The Student Research Office will be administered through the Office of Undergraduate Studies and directed by a full-time faculty member. The director will report to the Vice Provost of Undergraduate Studies and will be supported by one graduate assistant and one administrative staff. The proposed organizational structure of the Student Research Office is presented in Figure 1.
Figure 1. Proposed organizational structure of the Student Research Office

The duties of the director of the student research office will include the following responsibilities:

1. Overseeing student research centrally and coordinating with departments, colleges and other units on campus to enhance student research activity.
2. Encouraging student participation at local, state and national venues.
3. Being an advocate for student research, with particular emphasis in student access to research opportunities.
4. Seeking external partnerships and funding.
5. Working with the Student Research Advisory Committee to maintain and enhance student research at Boise State, as well as to annually select outstanding student researchers.
6. Working closely with other offices on campus (STEM Station, Service Learning, Career Center, Center for Teaching and Learning) in enhancing student research on campus.
7. Organizing the Annual Summer Undergraduate Research Conference.
8. Involved in organizing the Annual Undergraduate Research and Scholarship Conference during the Spring semester.
9. Integrating instruction in the responsible conduct of research in student projects.
10. Administering the SRI fellowship Program and the SRI Travel Program.
11. Giving class presentations at various levels of the curriculum and in every discipline about research opportunities for students and on how and why to get involved in research.
12. Coordinating with departments, colleges, multi-disciplinary programs on campus to enhance research.
13. Assisting students with applying to research programs at Boise State and beyond.
14. Speaking to the Alumni Association on campus about the value and impact of student research.
15. Publicizing NCUR (National Conference on Undergraduate Research), CUR’s Posters on the Hill in Washington, DC where students and administrators have an opportunity to meet and discuss student research with Idaho Senators and Representatives.
16. Offering workshops for students and faculty, such as “Writing a Competitive Application”, “Applying to Graduate School”, “Conducting Undergraduate Research Abroad”, “Developing a successful mentoring relationship”.
17. Keeping student research in the news, writing press releases and announcements for campus news (Update and Arbiter).
18. Participating at national level conferences with other program directors, such as CUR Dialogues.
19. Conducting scholarly work about student research opportunities on campus and the impact of student research

PHYSICAL LOCATION

The Student Research is located on the second floor in the Simplot Micron Technology building. The layout of Student Research includes a dedicated conference room at the entrance and two offices (the director of the SRI program uses one of the offices to allow for one-to-one meetings). The conference room is used for the SRI cohort meetings, monthly meetings of the Summer Research Community and student gatherings. The location allows us to communicate and partner with
several other student-based programs/offices (Service-Learning, International Learning Opportunities and the Linguistics Lab). For example, we have collaborated with the Service-Learning on a number of issues related to student research. The Student Research also has access to a formal conference room that holds 10-12 people.

PROJECTED BUDGET

A projected budget for FY15 and a brief explanation of the expenses is presented in Table 1.

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<th>OPERATING EXPENSES</th>
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**TOTAL FUNDING**

$159,960

Table 1. Projected budget for FY15

REFERENCES

FIRST ANNUAL STUDENT RESEARCH INITIATIVE (SRI)  
GRADUATE SEMINAR  

BOISE STATE UNIVERSITY  
Student Union Building, Trueblood Room  

May 9, 2013
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SCHEDULE

9:35 a.m. - 9:45 a.m.
Aidan Riordan-Buell, *spREADing the word virally*

9:50 a.m. - 10:00 a.m.
Brittany L. Cannon, *DNA-Based Excitonic AND Logic Gate*

10:05 a.m. - 10:15 a.m.
Jessica Ewing, *Melville in Tahiti: A GIS Approach*

10:20 a.m. - 10:30 a.m.
Jami Johnson, *Biomedical Photoacoustic Imaging using Gas-coupled Laser Acoustic Detection*

10:35 a.m. - 10:45 a.m.
Chris Mallory, *Investigating Aziridinomitosene cytotoxicity in human cancer cell lines*

10:50 a.m. - 11:00 a.m.
Zachary Pope, *Validity and Reliability of Disordered Eating Assessment Tools in Athletes: A Review*

11:05 a.m. - 11:15 a.m.
Benjamin S. Reed, *An Excerpt from “now hear mee relate / My Storie: “Paradise Lost, Plutarch, and The Use of Narrative and Memory in Establishing Identity” and Discussion of the Potential for Further Collaboration with Idaho State University’s English Graduate Student Association*

11:20 a.m. - 11:30 a.m.
Carla Dellaserra, *Use of Integrated Technology in Team Sports: A Review of Opportunities, Challenges, and Future Directions for Athletes*

11:35 a.m. - 11:45 a.m.
YuWen, *Immigrant Brides in Taiwan: New Land, New Hope?*

11:50 a.m. - 12:00 p.m.
Sara Goltry, *Long-Term Operability of a DNA-based Nanomachine in Human Serum*

12:05 p.m. - 12:15 p.m.
Mike Poulos, *Differences in Drainage Network Incision and Expansion Associated with Aspect-Related Variability in Soil Water Storage and Vegetation*

12:20 p.m. - 12:30 p.m.
Sadao Takabayashi, *Maximizing Nanoparticle Attachment onto DNA Origami Nanotubes*
ABSTRACTS

DNA-Based Excitonic AND Logic Gate
Brittany L. Cannon
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Coauthors: Donald L. Kellis, Elton Graugnard, Wan Kuang, William L. Hughes, Bernard Yurke, and William B. Knowlton

Scaffolded DNA Origami1 has been utilized as a “nanobreadboard” and decorated with nanoparticles (e.g. organic dyes, inorganic quantum dots and metallic nanoparticles) to engineer near-field optoelectronic devices. Successfully fabricated DNA origami-based excitonic devices include waveguides 2-5, switches 6, and logic gates 7-9. Recently, an alternative approach to scaffolded DNA origami, termed molecular canvases, has been introduced that uses short single-stranded DNA motifs (16-42 bps) to fabricate two- and three-dimensional nanostructures 10-12. DNA motifs can be viewed as molecular pixels/voxels and constitutionally selected to reconfigure the shape and size of the canvas. Similar to DNA origami, molecular canvas self-assembly is a one-step process that offers programmability afforded by DNA, however, without the aid of a long single-stranded scaffold. Molecular canvas structures can be utilized as nanobreadboards with programmable sub-diffraction resolution positioning of nanoparticles. Augmenting certain single-stranded DNA motifs with strand extensions, called sticky-ends (20-25 bps), enables nanoparticle attachment to occur via strand hybridization13 and allows dynamic device operations to be performed. Though the molecular canvas offers reconfigurability and modularity, it has yet to be utilized as a nanobreadboard for device applications.

Constructing single-module devices utilizing molecular canvases is the first step towards developing self-ordering modular devices. In Figure 1(a), we present a 16 nm X 28 nm two-dimensional molecular canvas composed of 28 short DNA strands used as a nanobreadboard for the attachment of fluorescent dyes (FAM, TAMRA, and Cy5) 11. Figure 1(b,c) demonstrates programmable reconfigurability of the structure shape and size as provided by the molecular canvas. AND logic operations and excitonic waveguides (e.g. photonic wires) are demonstrated through proximate positioning of four dyes onto nanobreadboards. The input and output dyes (named F and C, respectively) are attached directly onto nanobreadboards. Two intermediary dyes (T1 and T2) are attached to independent strands such that logic operations can be performed via strand hybridization. Attachment of all four dyes yields an energy waveguide resulting in photonic emission that is easily detected. As depicted in the truth table in Figure 1(d), a “truth” value corresponds only to the attachment of both T1 and T2 in which the ON-OFF threshold is surpassed.

Spectral data, such as that shown in Figure 1(e), is obtained by exciting the input dye (F) with 450 nm wavelength photons and monitoring fluorescent emission over a range of wavelengths. Excitonic energy
transfer from F to T1 & T2 and from T1 & T2 to C corresponds to spectral peaks at 579 nm and 661 nm, respectively. Logic operations are expressed by exciting F with 450 nm wavelength photons and examining fluorescent emission wavelengths from C at only 668 nm. Figure 1(f, g) demonstrates the attachment of T1 and T2 independently to define an ON-OFF threshold. Hence, we have validated the use of a molecular canvas as a nanobreadboard and demonstrated a near-field AND logic device that can be extended to fabricate near-field logic devices of greater complexity via a modular approach.

Acknowledgment
This project was supported in part by: (1) NSF Grant No. CCF 0855212, (2) NSF IDR No. 1014922, (3) NIH Grant No. P20 RR016454, (4) NIH Grant No. K25GM093233, (5) W.M. Keck Foundation Award, (6) DARPA Contract No. N66001-01-C-80345, and (6) Micron MSE PhD Fellowship. We also thank the students and staff within the Nanoscale Materials & Device Research Group (nano.boisestate.edu).

References

Use of Integrated Technology in Team Sports: A Review of Opportunities, Challenges, and Future Directions for Athletes
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Integrated technology (IT), which includes accelerometers, global positioning systems (GPS), and heart rate monitors, has been used frequently in public health. More recently, IT data have been used in sports settings to assess training and performance demands. However, the impact of IT in sport settings has yet to be evaluated, particularly in field-based team sports. This study provides an overview of IT’s emerging impact in sports settings through a systematic review. Twenty electronic databases (e.g. Medline, SPORTdiscus, ScienceDirect), print publications (e.g. Signal Processing Magazine, Catapult Innovations news releases), and internet resources were searched using different combinations of keywords accelerometers, HR monitors, GPS, sport training, and field-based sports for relevant articles published from 1990 to present. A total of 114 publications were identified, and 39 that examined a field-based team sport using a form of IT were analyzed. Articles chosen for analysis examined a field-based team sport using a form of IT. The uses of IT can be divided into four categories: (a) quantifying movement patterns (n=22), (b) assessing differences between demands of training and competition (n=12), (c) measuring physiological and metabolic responses (n=16) and (d) determining a valid definition for velocity and a sprint effort (n=8). The majority of studies used elite adult male athlete participants, and analyzed the sports of Australian Rules football, field hockey, cricket, and soccer, with sample sizes between 5-20 participants. IT’s limitations in a sport setting include scalability issues, cost, and the inability to receive signals within indoor environments. IT can contribute to significant improvements in the preparation, training, and recovery aspects of field-based team sports. Future research should focus on utilizing IT with female athlete populations and developing resources to use IT indoors to further enhance individual and team performances.
Melville in Tahiti: A GIS Approach
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This presentation will focus on Melville’s period in and around Tahiti in 1842, a part of the biographical record vexed by conflicting scholarly accounts of Melville’s whereabouts and actions, and by inconsistencies as well as outright falsehoods among surviving documents and the author’s own account of his experiences in his second book Omoo. Digitally expanding on methods of traditional scholarship, I will present the evidence in visual, electronic form by using ArcGIS software to map Melville’s movements, supplying relevant data and documentation and mapping alternate interpretations of the author’s travels. The layered digital maps will locate the author at specific dates and locations and will pinpoint the gaps and contradictions in our current knowledge. Along with presenting complex evidence in a vivid and user-friendly format, my talk will consider conflicting accounts of Melville’s imprisonment in a Tahitian calaboose with fellow sailors who had refused duty aboard the whaleship Lucy Ann. According to Edward Lucett’s account of his own imprisonment there in Rovings in the Pacific, Melville was the chief assailant in an assault he suffered at the hands of the incarcerated “mutineers”. Major scholars since Jay Leyda have rejected Lucett’s claim by arguing that Melville had escaped Tahiti by the time of Lucett’s imprisonment, with Hershel Parker asserting that Melville’s name and identity were “appropriated” by a remaining prisoner who perpetrated the abuse. Recently, however, Robert Suggs has sought to credit Lucett’s accusation while attributing the deed to violent tendencies in Melville’s character. While scholarship is divided regarding the veracity of Lucett’s claim and the known whereabouts of Melville on November 18, 1842, my paper will provide the fullest examination of surviving documents since Harrison Hayford conducted his research for the Hendricks House edition of Omoo (1969). I will compare Melville’s and Lucett’s accounts of the calaboose, will investigate current scholarly claims, and will focus on the existing evidence to determine what we can reliably conclude regarding Melville’s involvement in the incident.

Long-Term Operability of a DNA-based Nanomachine in Human Serum
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Coauthors: Tyler Park, Jeunghoon Lee, William L. Hughes, Bernard Yurke, Elton Graugnard, and William L. Hughes

Synthetic DNA devices have been widely studied in various buffers1 as well as in vivo2. DNA device performance and lifetime in biological fluids in vitro and in vivo is reduced by the presence of nucleases, naturally occurring enzymes that degrade both DNA and RNA. The ability to protect synthetic DNA devices from enzymatic degradation would expand the biomedical applications for DNA nanotechnology, ranging from drug delivery to disease theranostics. Previously, we presented stable operation of a supramolecular DNA-based nanomachine in human serum and heparinized whole blood. Here, we present evidence of the nanomachine’s partial operability in human serum, even on timescales of more than three days. The nanomachine consists of two 18 nucleotide (nt) double-stranded (ds) segments connected on one side by a 4 nt single-stranded (ss) hinge and on the other side by a 48 nt single-stranded actuator4. To monitor the state of the nanomachine, the A strand is labeled with a Cy5.5 dye and Iowa-Black RQ (IBRQ) quencher, on the 5’ and 3’ ends, respectively. When the actuator, 8, is in its single-stranded conformation, the dye/quencher pair separation approaches the Forster radius, and \( \sim 50\% \) FRET efficiency is achieved. The nanomachine is switched between three distinct mechanical states via the addition of ssDNA fuels and their complements. The addition of fuel F1 forces the nanomachine into its closed configuration (2), increasing FRET efficiency and decreasing the fluorescent emission. F1 is removed via strand invasion by the complement to F1, \( F_1^\prime \). The addition of fuel F2 switches the nanomachine into its open configuration (3), separating the dye/quencher pair, decreasing the FRET efficiency, and increasing the fluorescence emission. F2 is released via strand invasion by the complement to F2, \( F_2^\prime \). State changes are thus reversible and repeatable. The nanomachine was operated at a concentration of 250 nM in 100%
human serum and heparinized whole blood. On short timescales (∼4 hrs), injections of fuel strands induced state transitions similar to operation in buffer. To avoid errors in stoichiometry, fuel strands and complements were added with exponentially increasing concentrations according to \( m \times 1.5^n \), where \( m \) is the nanomachine concentration and \( n \) is the fuel injection number. We show representative kinetics data acquired by monitoring the emission from Cy5.5 as the nanomachine was switched between its relaxed and closed configurations (1 \( \rightarrow \) 2) after varying incubation times in serum at 25°C. The nanomachine still appears semi-operable, even after incubation in serum for 72 hrs. Degradation was greatly accelerated when the incubation temperature was increased to 37°C. Further exploration into degradation via nuclease activity and its prevention are warranted, as successful enzyme-free protection of synthetic DNA devices in vitro would create significant possibilities in the fields of DNA nanotechnology, biology, and biomedical engineering.

Acknowledgment
This project was supported in part by the: (1) W.M. Keck Foundation Award, (2) NIH Grant No. K25GM093233 from the National Institute of General Medical Sciences, (3) NIH Grant No. P20 RR016454 from the INBRE Program of the National Center for Research Resources, and (4) Micron MSE PhD Fellowship. We also thank the students and staff within the Nanoscale Materials & Device Research Group (nano.boisestate.edu).

References
(3) F. C. Simmel, Nanomedicine 2, 817 (2007).
Current studies have provided evidence that the C6-methyl analog has increased cytotoxicity in all cell lines, with IC50 values as low as 3 nM. Additional investigation has been geared towards determining the pathway in which AZMs exhibit their cytotoxicity. AZM 1 has been shown to elevate Caspase-3 activity in Jurkat and HL-60 cells greater than MC and 6-Me AZM. Nuclear morphology visualizations have further provided evidence towards an apoptotic pathway through AZM treatment rather than the necrotic cell death proposed by MC. Current efforts are directed towards the detection of ROS and crosslink formation in cellular systems after treatment with AZMs.

Validity and Reliability of Disordered Eating Assessment Tools in Athletes: A Review
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PURPOSE: A high prevalence of eating disorders (ED) and disordered eating (DE) among college-aged athletes has been observed. Although an accurate diagnosis of an eating disorder cannot be made with a pen and paper assessment, a number of measures have been developed to assess DE. Accurately assessing DE requires psychometrically sound measures. Currently, measures exist for assessing the prevalence of DE in the general population. However, the measurement properties of these measures have not been thoroughly examined or reviewed in athletes. The purpose of this study was to review the validity and reliability evidence of the commonly used measures for assessing DE in the college-aged athlete population.

METHODS: The databases searched were SPORTdiscus, CINAHL, PsycINFO, and the Psychological and Behavioral Sciences Collection. The search process was completed using the keywords “validity”, “reliability”, “eating disorders”, “college”, “athletes” in varying combinations. Inclusion criteria were that the study (a) assessed DE in the athletic population of 18 to 26 years of age and (b) investigated DE using a measure found to be valid and/or reliable in the general population and/or athlete population.

RESULTS/DISCUSSION: Out of 450 articles identified, 50 met the inclusion criteria. Sample sizes ranged from 17 to 3,316 participants. The five most commonly used measures were the Eating Attitudes Test (EAT; n = 23), Eating Disorder Inventory (EDI; n = 17), Bulimia Test-Revised (BULIT-R; n= 9), Questionnaire for Eating Disorder Diagnosis (QEDD; n= 8), and the Eating Disorder Examination Questionnaire (EDE-Q; n = 5). Construct, criterion, predictive, and convergent validity were reported/cited within the literature with the most common being criterion validity. Only five reported validity coefficients within the study (r = -.51 to .88) while 47 cited the validity coefficient (r = -.51 to .99) of the measure established in studies on the general population. Twenty-six reported a reliability coefficient (κ = .51 to .96) while 47 cited the reliability (κ = .81 to .98) of the measure obtained from studies on the general population. Internal consistency was the most common reliability measure reported/cited. Only three studies validated the less frequently used Weight Pressures in Sport Scale for Male Athletes, the ATHLETE Questionnaire, and Athletic Milieu Direct Questionnaire in an athlete population. Two studies found validity evidence for the more commonly used DE assessments (i.e., EAT, EDI, BULIT-R, QEDD, and EDE-Q) in an athlete population initial validity evidence was found for the EAT-26 in a study of female athletes and the same is true of one study using the QEDD on male athletes.

CONCLUSION: Although many studies reviewed reported validity and reliability coefficients of DE measures, many referenced the coefficients from studies validated in the general population. To accurately assess DE behaviors in athletes, cross-validation of these measures in athlete population is clearly needed.
Differences in Drainage Network Incision and Expansion Associated with Aspect-Related Variability in Soil Water Storage and Vegetation

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Aspect-related variability in soil water storage, vegetation type and density, and snow melt dynamics appears to dramatically influence drainage incision and expansion. The semi-arid Dry Creek watershed contains two 1.2 km wide west-draining valleys with side slopes comprised of broad north and south-facing land surfaces into which lower-order catchments have been incised. North-facing land surfaces exhibit thicker, finer-grained soils with more organic soil carbon that support coniferous forest. South-facing land surfaces have thinner, coarser-grained soils with less organic carbon that support sagebrush-steppe vegetation. The drainages and landforms associated with these surfaces contrast starkly. North-facing catchments (n=10) exhibit lower-order (single channel), steeper, shallowly incised, less dense drainages, that have a linear form in both profile and map view, with linear ridges between. They resemble debris chutes in scree dominated areas. Whereas, south-facing drainages (n=11), are higher order (dendritic), gentler, more deeply incised, and concave-up in profile, with undulose ridgelines between. The association of differences in drainage form with differences in soil properties and vegetation suggests that the greater soil water storage capacity of northern aspects, in conjunction with greater vegetative stabilization, inhibits fluvial and mass-wasting related erosion, as northern aspects are less likely to reach a saturated state, and limits the incision and expansion of north-facing catchments. Soils and vegetation affect the ability to reach a saturated state by altering the pedon-scale water-balance. Soil thickness affects the volume of the soil water reservoir. Soil texture and organic carbon affect the amount of water a given volume of soil retains. Thicker, finer-grained soils require more precipitation to satisfy their storage demands before reaching a saturated state. Coniferous forest may also increase storage as interception and increase transpiration losses, further reducing water inputs to soils and limiting drainage development on northern aspects. South-facing land surfaces are also greater in length, despite similar vertical relief, suggesting that differences in drainage expansion have caused ridgeline and/or basal streams to migrate, lengthening south-facing land surfaces and shortening north-facing land surfaces. This would induce a positive feedback, as larger south-facing catchments with lower storage capacities capture and route more water through their outlets than the smaller north-facing catchments, further exacerbating differences in drainage incision and expansion.

An Excerpt from “now hear mee relate / My Storie: Paradise Lost, Plutarch, and The Use of Narrative and Memory in Establishing Identity” and Discussion of the Potential for Further Collaboration with Idaho State University’s English Graduate Student Association

Benjamin S. Reed

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For my remarks today I will be reading an excerpt from my paper presented at the 8th Annual Intermountain Graduate Conference on March 1st, 2013. I will also briefly describe my experience at the conference and the exciting possibility of working with ISU in future collaboration of this event. The fact that Boise State University is such a prominent institution in the state and lacks an English/Humanities graduate conference to call its own encourages me to speak in support that this potential alliance is an exciting and valuable opportunity that we can take advantage of.
spREADing the word virally
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Coauthors: Valerie Burden

This digital assignment’s purpose is for students to understand their audience beyond the classroom and to re-brand their work in a way that reaches a larger audience, through the creation of a YouTube video. They will decide how to best market their project by researching videos already virally successful.

Maximizing Nanoparticle Attachment onto DNA Origami Nanotubes
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High yield, proximal assembly of metallic nanoparticle arrays is essential for near-field, diffraction-limited, opto-electronic applications. 1 Nanoparticle arrays, with controlled spacing, have been assembled onto DNA origami nanostructures. 2 Studies of quantum dot attachment using biotin have shown that using multiple biotin tethers per binding site significantly increases attachment yield. 3 Extending this approach, here we report multi-tether attachment yields for DNA functionalized gold nanoparticles.

To explore multi-tether attachment of gold nanoparticles, three binding site strategies were designed. Designs included 1 tether per binding site (1x), 2 tethers per binding site (2x), and 4 tethers per binding site (4x). The 1x and 2x designs used existing DNA origami nanotubes, 2 while the 4x design required side-by-side dimerization of two parallel nanotubes to increase the axial concentration of tethers per binding site. For statistical purposes, all three designs incorporated 9 binding sites separated by 43 nm. The gold nanoparticles were 10 nm in diameter and were conjugated with 5’ thiolated DNA strands with a 5-thymine tether. Once synthesized and characterized via atomic force microscopy (Bruker Dimension Icon), images were analyzed to compare the attachment probabilities between designs. We will show the schematics and the representative AFM data for each design. The results indicate that the 4x tether design had the highest attachment probability (p = 0.95) and the lowest standard deviation (0.06). The 4x tether design also showed better nanoparticle alignment due to increased rigidity of the dimerized nanotubes. For this reason, the structure is referred to as a nano-optical rail because of its ability to linearly arrange nanoparticles.

When the periodicity of gold nanoparticles was reduced from 43 nm (9 binding sites) to 29 nm (14 binding sites) for the 2x tether designs, nanoparticle bridging was observed. Bridging occurs when one nanoparticle binds simultaneously to two adjacent binding sites. To minimize bridging, two unique binding site sequences (A and B) were introduced with a total of 18 binding sites. Identical binding sites (A or B) were separated by 43nm to prevent bridging, while nearest neighbor binding sites (A & B) were separated by 14nm.

Acknowledgment
This project was supported in part by the: (1) NSF Grant No. CCF 0855212, (2) NSF IDR No. 1014922, (3) NIH Grant No. P20 RR016454 from the INBRE Program of the National Center for Research Resources, (4) NIH Grant No. K25GM093233 from the National Institute of General Medical Sciences, (5) W.M. Keck Foundation Award, and (6) Micron MSE PhD Fellowship. We also thank the students and staff within the Nanoscale Materials & Device Research Group (nano.boisestate.edu).

References
Immigrant Brides in Taiwan: New Land, New Hope?
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Coauthors: Dr. Claudia Peralta

In the last two decades, transnational marriages have been growing in Taiwan, Republic of China (R.O.C). Increasing numbers of Taiwanese men have married bride immigrants from Southeast Asian countries (Vietnam, Indonesia, the Philippines, Thailand and Cambodia) and Mainland China. These women usually are from low socio-economic class and have little formal education. (Chen, Katsurada & Wu, 1998; Tsai, 2006; Tsai & Hsiao 2006) Their offspring are the so-called “New Taiwanese Children” (NTC). The academic performance of New Taiwanese Children has become a contested issue in Taiwanese society, because these children are viewed by some as not being able to contribute to society. The goal of this study is to explore the bride immigrant’s roles in Taiwan as mothers in the community. This study is a qualitative study that uses ethnographic tools. The data was collected through informal and semi-structured interviews and reflective journals. This study hopes to inform others in the field of international migration and share how bride mothers have learned to navigate their new adapted culture, the Taiwanese culture.

Keywords: bride immigrants, foreign brides, education, transnational marriage, New Taiwanese Children.
Student Research Office Logic Model

**INPUTS**
- University
- Colleges
- Institutes
- Funders
- Faculty
- Students
- Applicants
- Fellows
- Committees
- Program Staff

**ACTIVITIES**
- Mentoring
- Doing Research
- Presenting Research
- Workshops
- Speakers
- Graduate School Preparation
- Networking
- Research Supportive Courses

**OUTCOMES / IMPACT**

**Short-Term**
- Research Skills
- Communication Skills
- Writing Skills
- Confidence
- Graduate School Readiness
- Network of Peers and Contacts
- Pursuing Higher Goals
- Awareness of Careers in the Field

**Mid Term**
- Completed Research Project
- Retention in College
- Increasing knowledge
- Additional Research Experience in Field
- Publications
- Conference Presentations
- Applications to Graduate Schools

**Long Term**
- Increasing Enrollment in Graduate Programs
- Increasing Research
- Developing Research Supportive Curricula
- Developing integration of teaching and research
- Increasing Cross-Disciplinary Collaboration
- Building a University Culture that Supports UR

**Process Objectives**
- Provide undergraduate and graduate students with a research experience
- Provide activities that integrate student learning and faculty development
- Establish and maintain collaboration and synergy with other offices that seek to promote and sustain student academic success

**Outcome Objectives**
- Increase student knowledge and research experience
- Increase student interest in the field
- Increase retention and graduation
- Increase graduate school enrollment
- Increase research on campus

**Assessment Questions**
- Is the program marketed efficiently?
- Are recruiting strategies efficient?
- Is the number of applications sufficient?
- Are the students satisfied with the program?
- How much students are engaged in research and other activities?
- Where is the program successful?
- Where the program needs an improvement?
- How the students are benefiting from the program?
- Are students retained in the field?
- What goals is the program accomplishing?
- Are students accepted into graduate programs?
- What are the best practices of the program?
### Student Information

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### Project Information

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### Award Conditions

**The award is subject to the following conditions:**

1. A stipend of $1,400 will be provided for the Spring. Payments will be made to your student account and distributed in equal installments throughout the duration of the fellowship and wages will be subject to state and federal taxation.

2. The Spring Fellowship requires 14 weeks of research starting January 22, 2013 and at least 10 hours per week of work on the proposed project.

3. The proposed project is not part of a course for which college credits can be earned.

4. An award of up to $400 of support will be provided for research expenses for the proposed project.

5. An award of up to $500 can be provided to help cover expenses related to participation in and dissemination of the research results of this SRI funded project at a national research conference. The award is subject to the requirements of the Boise State SRI Travel Award and is contingent upon providing proof of abstract acceptance by the conference.

6. I am not receiving, and will not receive, payment or a stipend from another source for my work on the project funded by the SRI Fellowship Program.
7. I will participate in all the scheduled monthly SRI Program cohort meetings during this fellowship and will give presentations of my progress on the proposed research project. I understand that if I miss more than two cohort meetings, this may impact my fellowship.

8. When requested I will submit appropriate mentor approved progress reports to the SRI program.

9. I will complete the project within the approved time and budget.

10. I will present my research results at the 2013 Boise State Undergraduate Research and Scholarship Conference.

11. I will give a presentation at the 2013/14 SRI Program, if invited to do so.

12. Unless requested otherwise the SRI program has permission to include my photograph, name, college, department and major in press releases and other publication materials.

13. In all publications, presentations or creative works based on activities conducted on this project during the fellowship I will acknowledge support of the Boise State SRI Program.

14. I am responsible for obtaining appropriate permissions and for complying with all policies concerning human subjects, hazardous materials, vertebrate animals or endangered species, and concerning copyright and intellectual property.

15. I understand that if I fail to comply with the SRI fellowship terms and conditions then the SRI Program will terminate my fellowship.

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**Student’s Acceptance of the Award**

By signing here, ____________________________ Date: __________

Last            First            M.I.

I am pleased to accept the **Boise State SRI Fellowship for the Spring of 2013**.

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**Student’s declination of the Award**

By signing here, ____________________________ Date: __________

Last            First            M.I.

I am declining the **Boise State SRI Fellowship for the Spring of 2013**. I understand that I am releasing my position and the Fellowship will be offered to another applicant.

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This form must be e-mailed by December 15, 2012 to sri@boisestate.edu. Failure to send this acceptance form by the date above will result in forfeiture of the award.