

**Affordable Learning Georgia Textbook Transformation Grants
Round Nine
For Implementations beginning Summer Semester 2017
Running Through Spring Semester 2018**

Proposal Form and Narrative

- *The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.*
- **Note: The only way to submit the proposal is through the online form in Georgia Tech’s InfoReady Review at:**
<https://gatech.infoready4.com/#competitionDetail/1757803>
- *If you are copying and pasting into InfoReady Review from this form, first convert the file to **plain text** and copy/paste from the plain text file.*
 - *In Word, go to File > Save As... > and change the file format to “Plain Text (.txt).”*
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 - *Be sure to save both copies in case you are asked to resubmit.*
- *Microsoft Word Document formatting pasted into InfoReady Review will render the reviewer copy unreadable. **If you paste Word-formatted tables into InfoReady Review, you may be asked to resubmit your application if time permits.***
- *Italicized text is provided for your assistance; please do not keep the italicized text in your submitted proposal. Proposals that do not follow the instructions may be returned.*

Submitter Name	Dr. Liqiu Zheng
Submitter Title	Assistant Professor of Physics, Department of Chemistry & Forensic Sciences
Submitter Email	Liqiu.Zheng@asurams.edu
Submitter Phone Number	2294207052
Submitter Campus Role	Principal Investigator (Primary)
Applicant Name	Dr.Liqiu Zheng Dr.Arun K. Saha

Applicant Email	Liqiu.Zheng@asurams.edu				
Applicant Phone Number	2294207052				
Primary Appointment Title	Assistant professor of physics				
Institution Name(s)	Albany State University				
Team Members	<p>Dr. Liqiu Zheng, Assistant Professor of Physics, Department of Chemistry & Forensic Sciences, Liqiu.Zheng@asurams.edu;</p> <p>Dr. Arun K. Saha, Associate Professor of Physics/pre-engineering, Department of Chemistry & Forensic Sciences, arun.saha@asurams.edu</p>				
Sponsor, Title, Department, Institution	<p>Dr.Seong S.Seo</p> <p>Chair of Department of Chemistry & Forensic Sciences</p>				
Proposal Title	Non-Science major students' science learning at zero cost				
Course Names, Course Numbers and Semesters Offered	Physical Science II, PHYS1012; Spring 2018				
Final Semester of Instruction	Spring 2018				
Average Number of Students Per Course Section	25	Number of Course Sections Affected by Implementation in Academic Year	14	Total Number of Students Affected by Implementation in Academic Year	350

Average Number of Course Sections Per Semester	Summer 2 sections, Fall 7 sections, and Spring 5 sections. Average number of course 7 sections per semester
Award Category (pick one)	<input type="checkbox"/> No-or-Low-Cost-to-Students Learning Materials <input checked="" type="checkbox"/> Specific Core Curriculum Courses
Are you planning on using an OpenStax textbook?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
List the original course materials for students (including title, whether optional or required, & cost for each item)	The Physical Universe 16th Edition by Konrad Krauskopf, Arthur Beiser, <i>ISBN-13: 978-0077862619</i> \$238.00 Required
Requested Amount of Funding	\$10800.00
Original Per Student Cost	\$238.00
Post-Proposal Projected Per Student Cost	\$0.00
Projected Per Student Savings	\$238.00

Projected Total Annual Student Savings	the total amount of annual students savings \$238.00*25*7*2=\$83,300.00
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NARRATIVE

1.1 PROJECT GOALS

List the goals you are trying to achieve with the transformation, including goals for student savings, student success, materials creation, and pedagogical transformation.

The goal is to improve the overall physical science education quality; to boost the passing rate and decrease the withdraw rate for physical science learning; and eventually to enhance the retention rate campus-wide by adopting zero cost and readily accessible electronic teaching/learning textbook (eBook) in GeorgiaView. Without buying a costly textbook, students could perform lots of learning activities at a one-stop learning environment to ensure their science learning outcomes. Free online **OpenStax** textbooks will be adopted as a primary textbook. By taking advantage of GeorgiaView—a well-designed online course platform, various best-illustrated topics of physical science will be selected from different open source textbooks and will be contained in GeorgiaView as important supplemental learning materials. Meanwhile, as one unique science class, virtually all physical science concepts relate to the things in our daily life. In order to better grasp the concepts, YouTube online demonstration will be linked to GeorgiaView to further enhance the learning outcome because it could easily relate physical science concepts to the more familiar things in day to day life. Additionally, problems and exercises for better understanding/applying each and every concept, which are stated in different styles, will be embedded in GorgiaView to better suit the learners from different backgrounds.

1.2 STATEMENT OF TRANSFORMATION

- *Describe the transformation.*
- *Identify stakeholders affected by the transformation.*
- *Describe the impact of this transformation on stakeholders and course success.*
- *Describe the transformative impact on the course, program, department, institutions, access institution, and/or multiple courses.*

With varying degree of math-phobia, non-science major undergraduate students choose not to enter into science fields. Any class involved math would be very intimidating to them. The worst thing is that Physical Science requires students to apply math properly

to solve the real world problems. Oftentimes, Physical Science I&II are taken by those non-Science majors when they are mandated to take science class with no other option. Under such circumstances, there are lots of **problems** in Physical Science learning. First of all, the **higher failing rate** (for instance, the failing rate was 35% in 2015 fall) occurs among those passive learners with low confidence because of their math phobia. They do not even read the textbook and complete their homework assignments because they tend not to buy textbooks with the high cost, which worsens the situation. Secondly, **the higher withdraw rate**(for example, the withdraw rate was 20% in 2016 Fall) is resulted from the fast pace college teaching and no other helping/reading materials available for them. They feel behind very soon enough and then drop out of the Physical Science class. Eventually they might drop out of college due to their unsuccessful science experience, which would **harm the overall retention rate** campus wide. Meanwhile, such bad science experience would stop those undecided from choosing science as major.

The **proposed solution** is to provide readily accessible eBook at zero cost through GeorgiaView to improve the course delivery so that 100% students will be prompted to read book and perform learning activities at a one-stop platform.

Key benefits: In addition to save \$238.00 per student per semester, their science learning outcome will be significantly elevated; a larger number of teachers and students will benefit from the developed teaching/ learning materials accessible through online with free of cost; and the more effective pedagogy will be explored to deliver knowledge; the overall physical science education quality will be enhanced; and thus, the higher passing rate and lower dropping out rate will be ensured; the overall retention rate will be boosted. If the approach is tested to be successful, it could be expanded to other science courses so that more and more teachers/students would benefit from it.

1.2 Transformation Action Plan

Action plans must address:

- *The identification, review, selection, and adoption/adaptation/creation of the new course materials.*
- *The course and syllabus instructional design/redesign necessary for the transformation.*
- *The activities expected from each team member and their role(s): subject matter experts, instructional designer, librarian, instructor of record, et al.*
- *The plan for providing open access to the new materials.*

The identification, review, selection, and adoption/adaptation/creation of the new course materials.

For Physical Science (PHYS1012), **OpenStax textbook** will be utilized as a primary textbook because of its free online accessibility. By taking advantage of GeorgiaView—a well-designed online course platform, various best-illustrated topics of physical science will be selected from different open source textbooks and posted in GeorgiaView, in

order to sufficiently clarify each concepts/definitions. As one unique science, nearly all the concepts in physical science relate to things in our daily life. Relating what they learn to the familiar stuffs in their daily life would help them better understand physical science, boosting their science learning confidence. YouTube quick demonstration will be easily adopted and linked to GeorgiaView since it is readily available, which could serve as an amazing teaching/learning resource in connection physical science concepts with things in our day to day life. Existing YouTube resources will be employed. Thanks to the aficionados of physics all over the world, there is a large pool of demonstrations on any single topic, for instance, Newton's first law, which allows us to freely choose the best ones around our lesson content. Those content and links will be embedded in GeorgiaView. At zero cost, YouTube demonstration could facilitate students to better grasp concepts, eventually to enhance the overall learning outcomes. Additionally, a poor attitude/outright hostility to math will translate into reluctance on the part of the students to do homework assignment. Therefore, problems and exercises for further understanding/applying each and every concept, which are stated in different styles (some are heavily math-based, some are simply conceptual), will be embedded in GorgiaView. They will be assigned to students to practice and test. Various type questions in GeorgiaVeiw will accommodate different learners' needs because they are from different non-science fields. Students with solid math background would feel the course challenging enough while the students with math-phobia would not feel behind. In order to complete the homework assignments and earn good grades for tests, students are required to read all assigned reading materials. As far as reading materials are concerned, they have multiple options, either consulting with OpenStax textbooks or the selected best-illustrated topics, to better suit their own learning styles to enhance the learning outcomes. Moreover, GeorgiaView is designed in such a way that allows instructors to track how much time devoted to learning activities for each student and easily pinpoint poorly performing students. Instructor will conduct timely consultancy / intervention before he/she withdraws from the class; as a result, the lower withdraw rate will be ensured.

The course and syllabus instructional design/redesign

The current syllabus will be modified to reflect the instructional redesign. The instruction on attendance policy, how to enroll the course, how to do their homework/tests, the weights of homework, quizzes, exams will be well stated in syllabus.

The activities expected from each team member and their role(s): subject matter experts, instructional designer, librarian, instructor of record, et al.

Dr.Zheng has expertise in GeorgiaView (Used to be D2L) and has employed D2L since 2011. Some class activities have been performed through GeorgiaView, for example, homework assignment submission, test taking, reading materials posting and so on. In order to turn Georgiaview into a full-fledged supplement of free online learning resource, along with the OpenStax, more time and efforts are in need.

Dr.Saha has experience in GeorgiaView as well and took the lead to conduct Affordable Learning Georgia Transformation on Introductory Physics in the past.

The plan for providing open access to the new materials.

First of all, the syllabus, which serves as a comprehensive guidance for all changes, will be redesigned and planned out carefully, and then posted on GeorgiaView. Secondly, OpenStax will be adopted and linked to GeorgiaView as a primary textbook. Based on the experiences of instructors, best-illustrated topics will be collected from various open source textbooks and posted to GeorgiaView over times. Next, topic-related Youtube demonstration will be linked to GeorgiaView for each chapter to fortify the learning outcomes. Meantime, numerous problems and exercises, which are stated in different styles, will be selected for students to practice and apply what they learn. All the problems and exercises will be posted on GeorgiaView right after each chapter.

1.3 QUANTITATIVE AND QUALITATIVE MEASURES

- *The quantitative and qualitative measures of impact on student success and experience. The quantitative and qualitative data collected will be utilized in your final report as well as within ALG program communications.*
- *It is important to identify how the data is to be analyzed for each data source. In specific, the action plan must address the project's quantitative impact on student success (items such as Learning Objective success, Drop, Fail, Withdraw (DFW) delta rate, and any other critical factors) to measure impact on student experience.*
- *Qualitative measures can include student feedback through surveys, interviews, focus groups, or other means.*

Project's **quantitative** impact on student success will be measured at the end of semester (middle of April 2018) by comparing failing and withdraw rate over the last 5 years period. **Qualitative** measurement will be performed by obtaining student feedback through two surveys – one in middle of February and the other in middle of April 2018 by asking questionnaires on confidence in math-based science learning, affordability, accessibility and satisfaction on text book, how long / how often they read book, motivation for homework, expectation in course and so on.

Benefited Student numbers - Just for the proposed course Physical Science II (PHYS1012) 125 students will be benefited with annual savings of $\$238 \times 125 = \$29,750.00$. But this transformation action can easily be extended to Physics Science I (PHYS 1011) ($7 \times 25 = 175$ students) with annual savings of $\$41,650.00$. There are two sections of Physical science in summer ($2 \times 25 = 50$) with annual savings of $\$11,900.00$. Projected annual savings will be $\$29,750.00 + \$41,650.00 + \$11,900.00 = \$83,300.00$. If the approach is expanded to the other courses, more savings will be easily attained.

1.4 TIMELINE

This is a timeline of milestone dates for your transformation project through the end of the first semester the transformed course(s) is/are offered to students. Your interim reports will utilize this timeline to indicate if the project is on schedule.

When submitting this timeline in InfoReady Review, be sure to use the Paste from Word button in order to correctly paste a table from Word. Otherwise, the document will be unreadable to reviewers.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
OpenStax eBook adoption & Course setting for Spring 2018 (Zheng)	x								
Syllabus Redesign (Zheng, Saha)	x	x							
Instruction Redesign (Zheng, Saha)	x	x	x						
Chapter Summary (Saha)	x	x	x	x					
Course Release (Zheng, Saha)				x	x	x	x		
Data Collection for evaluation purposes (Zheng, Saha)					x		x		
Evaluation of course effectiveness (Zheng, Saha)						x		x	
Final report (Zheng, Saha)								x	x

1.5 BUDGET

Include Personnel & Projected Expenses as appropriate for the category.

Proposals must involve teams of at least teams of 2 or more of any of the following: faculty, faculty librarians, instructional designers, subject matter experts, editors, graphic designers, or others as needed. It is required to include the \$800 for overall project expenses and travel in this section.

Two levels of funding are available based on the scale of the project proposed:

Standard-Scale Transformation: Textbook transformation projects within one or more courses or sections with under 500 students enrolled on average per academic year total.

*\$10,800 maximum award
\$5,000 maximum per team member
\$800 for travel and expenses*

Large-Scale Transformation: Textbook transformation projects within one or more courses or sections or department-wide adoptions with 500 or more students enrolled on average per academic year total.

\$30,000 maximum award
 \$5,000 maximum per team member
 \$800 for travel and expenses

*Funding is **not a direct stipend** to the team members, but rather goes **to the institution to cover the team member's time** (salary/release time/overload/replacement coverage), project expenses including related department needs, and travel expenses (up to \$800 is specifically designated for at least two team members to attend the required in-person kickoff meeting).*

The proposing team must coordinate as necessary with their departments and institutional sponsors to determine how to handle the distribution, including amounts, release time/overload/salary/replacement as well as semester(s). This provides the maximum flexibility to the institution and the team in terms of how many people and what types of skills are needed, amount of compensation vs. replacement of teaching load, and timing in terms of semesters of preparatory work vs. semesters of adoption.

Item	Justification	Amount
One course release for Dr. Liqiu Zheng	Dr. Zheng will adopt OpenStax eBook with home assignment administered by GeorgiaView, create necessary settings & post necessary materials in GeorgiaView.	\$4500.00
One course release for Dr. Arun Saha	Dr. Saha will compose chapter/topic summary for each chapter/topic suitable for GeorgiaView.	\$4500.00
2 iPads for Zheng & Saha	For portability of activities	\$800.00
Travel for Zheng, Saha	To share experience in SACS AAPT meeting	\$1000.00
	Total	\$10800

1.6 SUSTAINABILITY PLAN

What is your plan for offering the course in the future, including maintenance and updating of course materials?

The redesigned course Physical Science II (PHYS 1012) will be offered every academic year. The syllabus and materials will be available and hosted in GeorgiaView(D2L), which will be easily accessible to those who are taking physical science. Meantime, a copy of the related syllabus and teaching materials will be stored in the institutional repository of Albany State University, which will be maintained by the library of ASU. As a result, materials will be available everywhere to everyone who has an interest, due to the fact that OpenStax, those carefully selected topics from open sources, and Youtube, all of them are under an open license. Instructions for course adoption and settings through

GeorgiaView will be saved by the department so that any instructor can move forward with the course without difficulty. GeorgiaView portion of the course will be updated on a regular basis as necessary and instructions for latest science or technological developments will be obtained by instructors and added to GeorgiaView by IT department, if necessary. All instructional materials will be well-organized/ stored on GeorgiaView, which leads to a seamless transition from semester to semester, from one instructor to another instructor.

1.7 REFERENCES & ATTACHMENTS

A letter of support has been be provided below.