

The James Martin Center for Nonproliferation Studies  
Monterey Institute of International Studies,  
A Graduate School of Middlebury College



## Virtual Science Challenge

“Global Connections and Exchange Program:  
US-Russia Virtual Science Challenge for Youth”  
Topic: Nuclear Spent Fuel Management

This program is funded by the US Department of State’s  
Bureau of Educational and Cultural Affairs

### About the Program

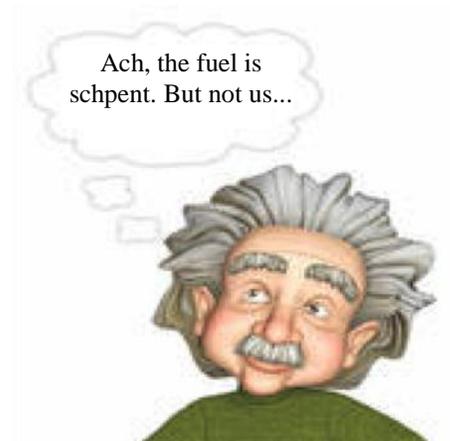
**W**hat happens inside a nuclear reactor? What does it use for fuel, and where does that fuel go after it has been “spent”?

**E**ven if you have never heard of “Nuclear Spent Fuel Management,” you probably heard about the recent nuclear accident in Japan or about the prospect of nuclear terrorism.

**CAN** you guess how these are related? Apply for the Virtual Science Challenge if you are:

- Concerned about the future of our planet and believe that science will be part of the solution
- Want to be part of a US-Russian team of science students working on global problems related to radiation and nuclear weapons.

**Y**oung people with scientific knowledge are vital to a future world in which nuclear weapons are contained and, ultimately, eliminated. To solve global problems related to these weapons, collaboration between the countries with the highest number of weapons - the United States and Russia - is essential. The **Virtual Science Challenge** is designed to enhance mutual understanding between Russian and U.S. high school students through science collaboration for a more secure and safer future.





**Using** a dedicated and secure online learning and collaboration environment, high school students and teachers investigate the control of nuclear fuel, which, if not managed properly, could cause a widespread release of radiation or be used in the development of nuclear weapons. The goals of the program are to:

- Develop a science education community of U.S and Russian teachers and high school students
- Help develop and enhance students' scientific knowledge, critical thinking and scientific reasoning abilities, and presentation skills
- Promote cross-cultural cooperation in the sciences among students and teachers in the United States and Russia
- Guide students in a scientific investigation of real-world solutions for the safe and secure storage and management of nuclear waste and spent nuclear fuel.

**Through** online workshops, E-learning modules, and educational materials, students become familiar with the science and technology of nuclear weapons, nuclear reactors, the nuclear fuel cycle, and the risks posed by enriched uranium and plutonium.

**Next**, students focus on options for handling spent nuclear fuel, which requires scientific prowess, cross-cultural understanding and cooperation. Each team will select a different country to investigate. This investigation will require students to research not only the scientific options available, but also the risks that different technologies pose for the proliferation of nuclear materials, the geology of the countries they study, and public and political opinions about various solutions.

**At** the final stage, all teams will come together and present their findings and proposed solutions in the **Virtual Science Fair**, in a format of their choosing.

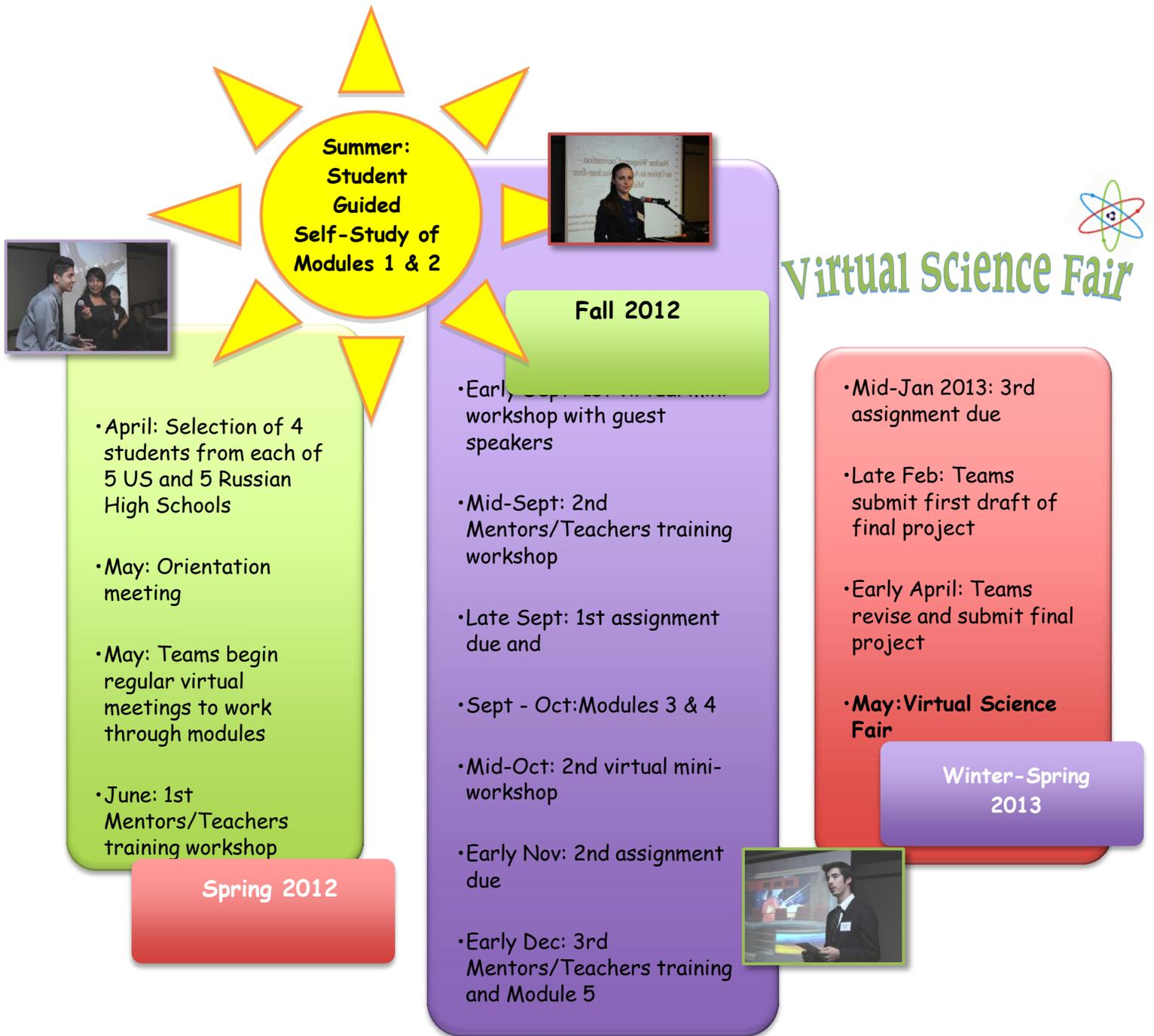
**The problem of spent fuel management is global and urgently needs to be solved.**

**Working** together, students from Russia and the United States can discover new ideas and new ways to think about the issue. Tackling a real-world scientific problem enhances students' motivation to study and deepen their scientific knowledge.

**Project Structure: Password Protected Virtual Classrooms**

Supervising Teacher from each school				
<b>Virtual Science Challenge Website</b>				
<b>Project Resources and Information</b> <b>Social Networking</b> <b>5 self-access e-learning modules with activities and quizzes</b>				
Virtual Classrooms				
Team A	Team B	Team C	Team D	Team E
1 Russian Mentor	1 Russian Mentor	1 Russian Mentor	1 Russian Mentor	1 Russian Mentor
1 American Mentor	1 American Mentor	1 American Mentor	1 American Mentor	1 American Mentor
4 Russian Students	4 Russian Students	4 Russian Students	4 Russian Students	4 Russian Students
4 American Students	4 American Students	4 American Students	4 American Students	4 American Students
<b>3 team assignments</b> <b>1 team project for the Virtual Science Fair</b>				

## Project Structure and Timeline



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### Student Application

**Application Due Date: March 30, 2012**

**Notification of Acceptance: April 15, 2012**

THIS IS AN OPEN APPLICATION TO THE PROGRAM. All students in each participating school are eligible to apply. The program staff will select four students from each of the 10 participating high schools based on eligibility and the quality and persuasiveness of the student’s essay.

Please read the program description and review the project timeline before completing all questions on the application. All applications must be accompanied by an essay (see below).

First and Last Name: \_\_\_\_\_

School Attending: \_\_\_\_\_

Participating Teacher: \_\_\_\_\_

Are you comfortable using English to complete this program?  Yes  No

#### Eligibility

Year in School:  Freshman  Sophomore  Junior  
(students must be enrolled in school in spring of 2013)

Applicant is a Russian citizen  Yes  No

Applicant has read the project description and timeline, and can commit to all project requirements, spending a minimum of 5 hours per week during the school term (after summer 2012), at times arranged by the applicant’s team members.  
 Yes  No

Essay: Write at least 300 words but no more than 500 words, telling us about what inspires you or what concerns you most about a particular scientific discovery. Attach the essay to this application.

Commitment: Please read the description of the program, below, and review the timeline.

I can commit to participation in the entire program  I cannot commit to the entire program

Signature: \_\_\_\_\_

**Please scan and email this application with your essay via email to:**

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