From 1992-2011 - A Timeline
UNIVERSITY OF NEW HAMPSHIRE

June 13, 1991

TO: Participants in Project SMART Discussions and Drafts
FROM: Walter Eggers, Vice President for Academic Affairs

I am happy to report that the Governor is enthusiastic about our proposal and plans to provide $250,000 in State funding for five years. When we get final confirmation, I will call the group together again so that we can begin to refine and implement the plan. President Nitzschke asked me to convey his gratitude for a job well done.

In a related development, we will send members of the group to a planning conference at NSF to get information about major state-wide funding for science and mathematics education. We will have a report on this subject when we meet again.

We have shown the Governor how effectively this institution can respond to the needs of the State, and in the process, we have elicited a new kind of direct support from his office. The students and teachers we serve will be the chief beneficiaries of Project SMART, but your good work also enhances the University in the public view. Bravo!

cc: President Nitzschke
Project SMART evolves

- 1992-2002 Four modules – Biotechnology, Environmental Science, Marine and Aquatic Science, Space Science
- 2003 – Marine and Environmental Science emerges from the Environmental Science & Marine and Aquatic Science
- 2004 – Four UNH credits for INCO430 added with tuition waiver from the university
- 2006 – Nanotechnology added to Biotechnology

Geographic distribution of students –
- 1992 – 85 schools from 70+ towns in NH
- 1995 – Opened to New England
- 2006 – Weekend program offered and the program opened to national participants
- 2008 – Limited to students from inner-city New York area and some local
- 2009 – Opened to international students – students have come from Pakistan, Korea, Greece, Turkey, and India – Also, the first group of students from Alaska joined the program
The opening year was great – the opening ceremonies were attended by the Vice President for Academic Affairs Walter Eggers, several administrators, some trustees, parents of the students, several invited high school teachers, and UNH faculty. It was almost a full house at the Johnson Theater, with 100 young enthusiastic students and over 300 guests.
Highlights

• We started with over 400 applications from over a 100 NH schools, selected 100 students to participate in four modules – Biotechnology, Freshwater and Marine Science, Environmental Science and Space Science. The participants represented over 75 schools from 65 towns.

• They studied science, mathematics, were introduced to the best computers in the state (a novelty then), talked about social, ethical, legal, environmental, economic and political implications of the recent advances in science.

• They studied in the class room, in the fields, up in the mountains and on water.

• They interacted with each others, made friends with each others and with the faculty at UNH.

• They went home with memories that would last a life time.
While the Biotechnology group visited the Tufts University School of Veterinary Medicine, N. Grafton, MA to meet the ‘million dollar goats’, genetically engineered to produce the human anti blood clotting protein (Plasminogen Activator),......
And the Environmental Science students were in the field studying the forests and the climate........

The Marine and Aquatic Science students were in the ponds and lakes catching crayfish and studying the plankton........

So, where were the future Space scientists?
They came back from the space to teach participants in Project SMART-Rick Searfoss is a UNH graduate - confirm this

Rick Searfoss has led many different teams to the space. He commanded the most complex science research space mission ever, the STS-90 Neurolab flight on Columbia, with unparalleled mission success. He also piloted two other space flights, including a joint Russian-American mission to the Mir space station.

http://www.eaglestalent.com/Rick-Searfoss?source=Bing
In 1993, Rebecca, Ben and Kimberly, and Sheri, Keri and Zachary, along with Eric, Sofia and Josephine came with 50 others to have another successful year of Project SMART at UNH. Some still captured the plankton, others discovered that large animals (like sheep) could be cloned. The Space Science program was not offered this year.
The program continued in 1994 again with about 60 students, all from New Hampshire
1995 – Project SMART Opens its doors to New England
Students from around the New England region learning biotechnology. Plant Biotechnology with the Flavr Savr tomato (one that will not rot for several weeks) being introduced into the market created the big news and an interesting topic of discussion.
1996-1998

The program funding became reduced and the program started charging a fee for boarding and lodging, but continued with students coming from as far away as Maryland; mostly still came from the New England region.
2000
Project SMART swings into the Y2K with strong support of the administration (but with reduced funding), and looking forward to increase diversity of participants.

**PROJECT SMART**

Subhash Minocha, professor of plant biology and director of Project SMART, takes a moment in the closing ceremonies July 28 to thank the faculty who devote their time and energy to making the program a success. Behind him are Provost David Hiley, CEPS dean Art Greenberg, and COLSA dean Andy Rosenberg. This year, more than 50 high school students participated in the month-long program, which exposes them to research methodology and professional scientists. (Photo: Michelle Gregoire)
This is the year that visits to the Tufts Veterinary facility were stopped due to private ownership by Genzyme – Lonza Biologics filled the gap with visits to their facility in Portsmouth which produced human proteins in large scale cell cultures.
Project SMART Summer Institute
(Science And Mathematics Achievement Through Research Training)
July 1 - 26, 2002
University of New Hampshire
Project SMART-2003 Space Science students had a chance to talk to Piers Sellers, a space shuttle astronaut: STS-112 Atlantis (October 7 - 18, 2002); **STS-121 — Space Shuttle Discovery — (4–17 July 2006); STS-132 —- Space Shuttle Atlantis — (14–26 May 2010)**

*Campus Journal July 11, 2003*
Project SMART Summer Institute

(Science And Mathematics Achievement Through Research Training)

June 23 - July 18, 2003

University of New Hampshire
2003-2005

The program continued with little change in style but with big revolutionary advances in biotechnology field, major discussions in climate change, and the excitement of repeat visions of space through the space shuttle and the space station. The New England Biolabs facility moved to Ipswich, MA; an impressive grandiose set up – our association with them continued with them through full day visits.
Do you recognize any one of them? – The class of 2003
A wonderful segway into the college life – A Project SMART 2005 student at the New England Biolabs testing out the Segway transporter. Everyone had a chance to try it out.
2008
In July 2008, UNH Project SMART partnered with Harlem Children Society students to bring a group of 28 inner-city high school students to UNH. Students doing plant cloning DNA cloning, bacterial genetic engineering and discussing implications of these techniques

http://photo.unh.edu/Clients/harlem_childrens_society/index_2.html
Students from Harlem Children Society in the Biotechnology lab studying chromosomes
They said “they couldn’t sleep here in NH dorms, because…” “…it was too damn quiet”
Students attending the program in 2008 were connected live around the world from NH to New York to the African continent to share their experience in learning science.
2009
Nanotechnology students work at levels unseen - 2009
This image was captured by a video camera flown by high school students as part of the 2009 UNH Project SMART program, Space Science Module. The students were supervised by Lou Broad, a local high school teacher working in the program. They integrated the payload that included GPS and telemetry along with a radiation experiment and flew the payload under a weather balloon to 96,000 feet over the state of New Hampshire. Total flight, including the descent, was about 2 hours.
Students from Alaska and Greece join the program in 2009 adding a new dimension to diversity in the program – The exchange of ideas goes way beyond learning science.
2010
DURHAM, N.H. – A handful of high school students made history of a sort recently when the one-of-a-kind reentry vehicle they built out of pink Styrofoam and corrugated cardboard fell back to Earth without aid of a parachute following a 15-minute balloon ride up to 100,000 feet – the edge of outer space. The dish-shaped reentry vehicle – one meter in diameter and weighing under two kilograms, the Federal Aviation Administration limit – carried a payload of a miniscule Geiger counter, two temperature sensors, and two video cameras about the size of a pack of gum. During the flight the students obtained real-time measurements of changing levels of cosmic rays and atmospheric temperatures. The balloon burst (under pressure) at 100,000 feet, in the blackness of outer space. The balloon system uses amateur (HAM) radio and GPS for tracking and control. All flight parameters meet the FAA regulations (FAR 101).
While the Space science students were flying their balloon; the Marine and Environmental Science students were exploring the White Mountains looking for clues to measure the impact of climate change.
Senator Judd Gregg, whose initiative as Governor of New Hampshire gave birth to Project SMART Summer Institute sent his greetings on the upcoming 20th anniversary of Project SMART.
2011
They were doing it then (1992) and are doing it now
M&E students on their field trip to one of the local lakes collecting samples to analyze the planktons

PLATE MISSING WILL COME SOON

1. Plankton (singular plankter) are any drifting organisms (animals, plants, archaea, or bacteria) that inhabit the pelagic zone* of oceans, seas, or bodies of fresh water.

* Any water in a sea or lake** that is not close to the bottom or near to the shore can be said to be in the pelagic zone. The word pelagic comes from the Greek πέλαγος or pélagos,

** A lake is a body of relatively still fresh or salt water of considerable size, localized in a basin, that is surrounded by land apart from a river, stream, or other form of moving water that serves to feed or drain the lake.

1, *, ** http://en.wikipedia.org/wiki
While one group tries to scale the altitudes of >2 miles into space with a balloon (Space science-2010 – balloon article), and the other attempts to get into the depths of our mind and the level of atoms and molecules (the biotechnology and nanotechnology - poster on mind changing hormones and nanotubes); the third group searches for answers to problems on earth – the water and the climate (posters –pictures of M&E).
He's still there, we are still coming...21 years at NEB with Richard Grandoni who has kept in touch with Project SMART for the entire 21 years of the program

and the Lady from New York is still there too!
• **Partnerships**

• New England Biolabs, Peabody MA and Ipswich, MA ([www.neb.com](http://www.neb.com))

• Integrated DNA Technology, Des Moines, IA ([http://www.idtdna.com/site](http://www.idtdna.com/site))

• Rural Alaska Honors Institute, University of Alaska, Fairbanks, AK ([http://www.uaf.edu/rahi/](http://www.uaf.edu/rahi/))

• Summer Search Organization supports students to attend Project SMART ([www.summersearch.org](http://www.summersearch.org))


• NH EPSCoR (UNH) [http://www.epscor.unh.edu/](http://www.epscor.unh.edu/)

• Liberty Mutual Foundation - [http://www.libertymutualgroup.com](http://www.libertymutualgroup.com)
They clone plants and learn about cloning animals/humans – even chimaeras
Some found an evening to visit the Minocha home
On the final day of the program, everyone presents a scientific poster at a three-hour long session, which is attended by more than 200 students, faculty, teachers, parents and UNH administrators. Students take pride in preparing and presenting their posters.
Nanotechnology in Food Production

Creating Healthier Foods

Packaging

Controversy

Although food altered using nanotechnology results are harmful, there is no much support from the scientific community that such a process can be possible. Therefore, it is important to take caution when it comes to nanotechnology in the food industry.

Acknowledgments

Dr. Jimmy Raeder was head of the project, and thanks is required to understand the concept, and enduring endless graphing software, which he created in the programming explanation of the project and his assistance with the

Posters then (above - 2003) and posters now

Magnetospheric Entropy

Abstract

The Themis mission began in 2007 with the primary goal of observing and understanding the complex interactions that create the magnetosphere in the earth’s magnetotail. The Themis spacecraft was designed to study the thunderous waves that rip through the magnetosphere and to understand the nature of this dynamic space environment. The Themis mission is unique in that it provides a direct measurement of magnetic field fluctuations and energetic particle signatures.

Background on the Themis Project

This project was established due to the magnetic field measurements and energetic particle signatures made by the instruments on the satellite. The Themis spacecraft was designed to observe the magnetosphere and to study the nature of this dynamic space environment. The Themis mission is unique in that it provides a direct measurement of magnetic field fluctuations and energetic particle signatures.

What was accomplished

The presentation of the Themis project includes the different research that was accomplished by the Themis spacecraft. The Themis spacecraft was designed to observe the magnetosphere and to study the nature of this dynamic space environment. The Themis mission is unique in that it provides a direct measurement of magnetic field fluctuations and energetic particle signatures.

Acknowledgments

The authors of this paper would like to thank the National Science Foundation for their financial support of the Themis project.

In Closing

The authors of this paper would like to thank the National Science Foundation for their financial support of the Themis project.

Where does one go from here?

The authors of this paper would like to thank the National Science Foundation for their financial support of the Themis project.

Conclusion

The authors of this paper would like to thank the National Science Foundation for their financial support of the Themis project.
They turned blue then (1998) and glow now:
Genetically engineered bacteria produced by
Biotechnology students
A happy bunch saying goodbye! Project SMART - 2011

While they look happy as they finish their program; they are indeed sad to leave this place – BUT they’ll come again next year – a new group to make new friendships with UNH.
......But tears were visible in the eyes of many –
Must we leave?
College of Life Sciences and Agriculture
College of Engineering and Physical Sci.
UNH Provost’s office
NH Space Grant Consortium
Office of Multicultural Student Affairs

NH Agricultural Expt. Station
UNH Office of Admissions
The Vice Provost for Diversity
NSF Career Awards to faculty
McNair Grad. Opportunity Prgm.

Harlem Children Society
“The Purpose of Souls Is to Assist Each Other”
www.harlemchildrensociety.org
Thank you for traveling with us!

For more travels, please visit: www.smart.unh.edu