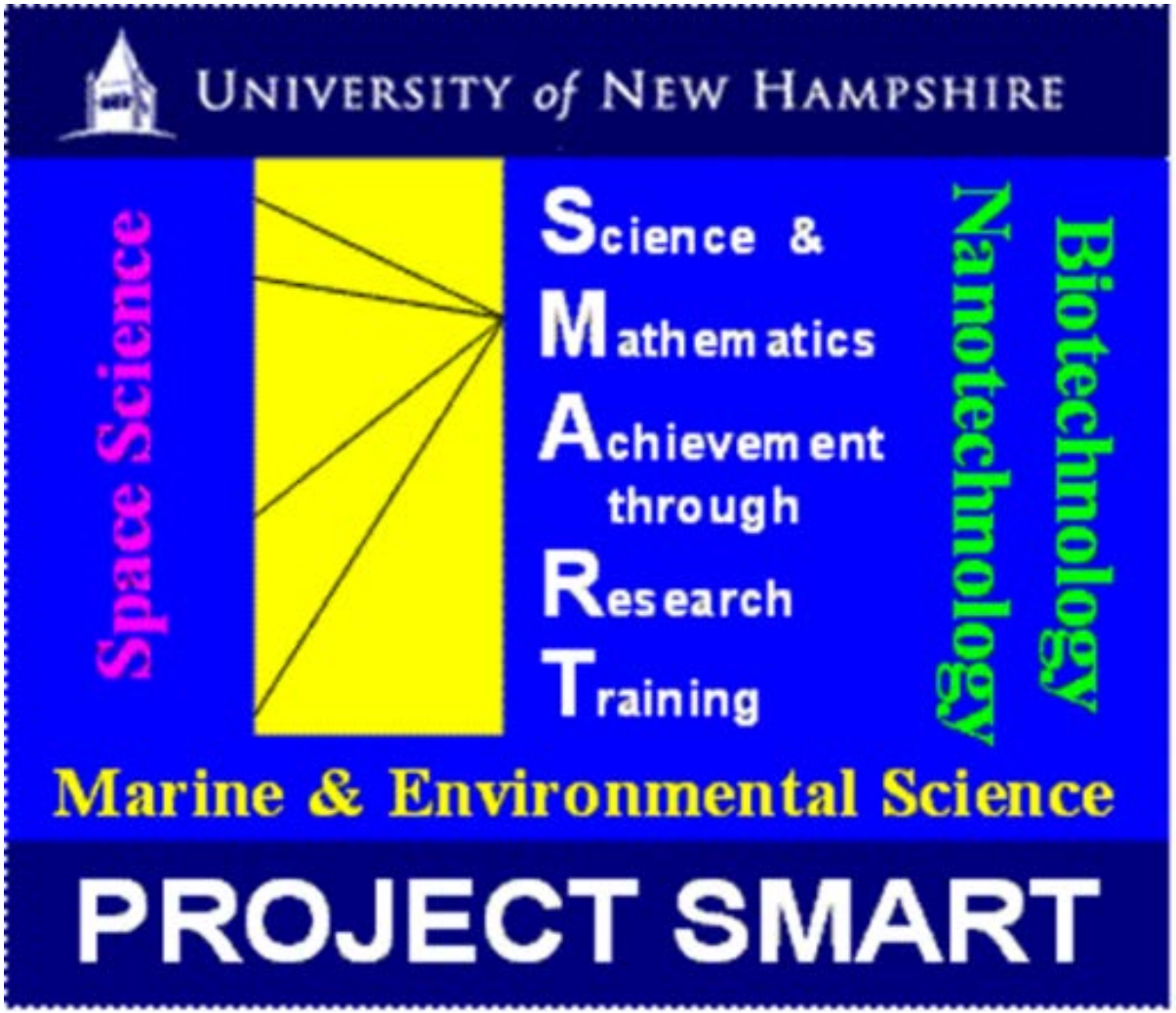


From 1992-2011 - A Timeline

Let's Begin

UNIVERSITY OF NEW HAMPSHIRE

VICE PRESIDENT FOR ACADEMIC AFFAIRS
DURHAM, NEW HAMPSHIRE 03824-3547
(603) 862-3290

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!

\l

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

JULY 9, 1992

One hundred of New Hampshire's top high school students recently arrived at UNH to participate in a new summer institute, Project SMART (Science and Mathematics Achievement through Research Training). A collaborative effort of many departments, the institute is being lead by professors Subhash Minocha, plant biology; Barry Rock, complex systems; Alan Baker, botany; Roy Torbert, space science; David Meeker, mathematics; and Joan Ferrini-Mundy, mathematics.

In the photo above, Minocha, left, Project SMART director, talks with student Kristen Stephens and her parents, Mary Helen an Bob Stephens, at opening ceremonies July 6. (Photo by Sharon Keeler)

In Brief

High school pupils study math, science at UNH

DURHAM — Several area high school students are studying advanced math and science at the University of New Hampshire this summer in a new program called Project Science and Mathematics Achievement through Research Training (SMART).

Students are each studying in one of four areas including biotechnology, freshwater and marine science, environmental science and space science.

They were selected based on their grades in science and math, recommendations from teachers and a brief essay describing their interest in the program.

Elizabeth Dell of Durham and Tamara Oliver of Exeter are studying biotechnology.

Joonu-Noel Andrews of Dover, Christopher Hilton of Durham, Kyle Krouse of Madbury, Justin Quimby of Dover, Patrick Russell of Durham, and Amy Swift of Dover, are studying space science.

These students are among 100 high schoolers from throughout the state selected to participate in the program.

The students taking part in Project SMART are studying advanced topics in science, math and computers through lectures, demonstrations, field trips and hands-on lab work.

They are learning about research from UNH faculty and graduate students.

Students live in residence hall
are receiving a stipend to cove
summer institute's full cost.

Project SMART runs through
31.

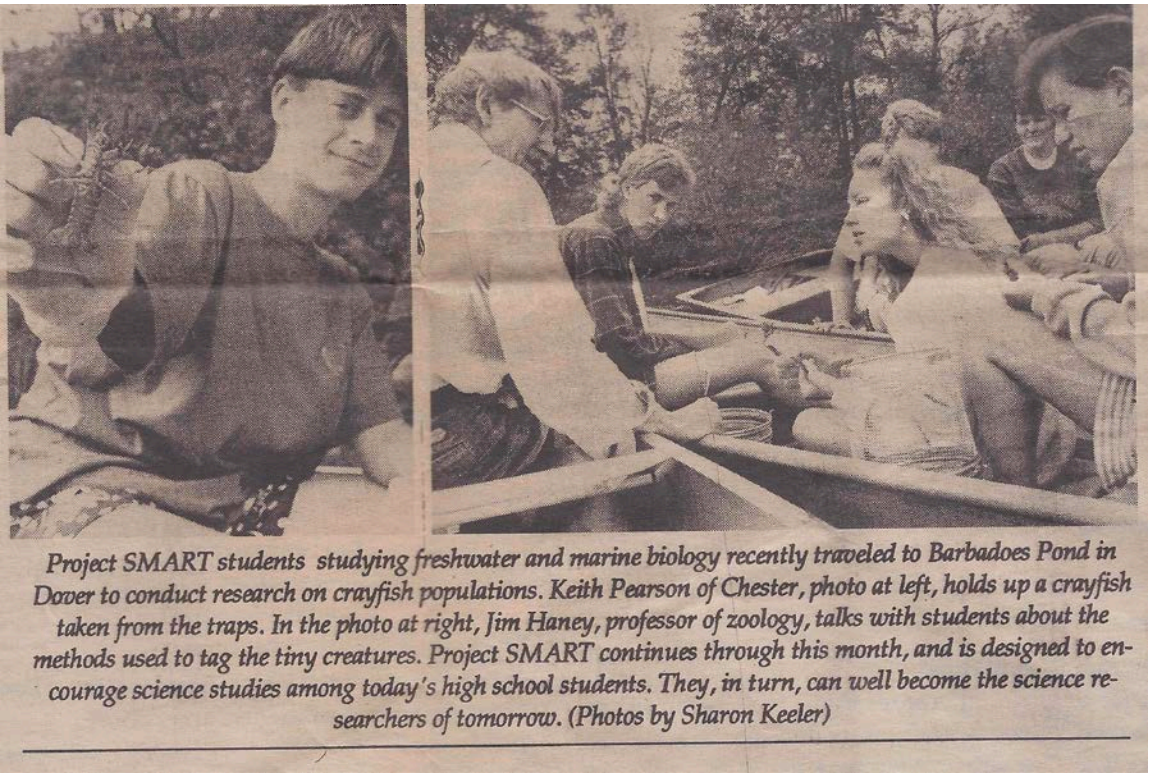
The opening year was great – the opening ceremonies were attended by the Vice President for Academic Affairs Walter Eggers, several administrators, some trustees, parents of the students, several invited high school teachers, and UNH faculty. It was almost a full house at the Johnson Theater, with 100 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……..



Project SMART students studying freshwater and marine biology recently traveled to Barbadoes Pond in Dover to conduct research on crayfish populations. Keith Pearson of Chester, photo at left, holds up a crayfish taken from the traps. In the photo at right, Jim Haney, professor of zoology, talks with students about the methods used to tag the tiny creatures. Project SMART continues through this month, and is designed to encourage science studies among today's high school students. They, in turn, can well become the science researchers of tomorrow. (Photos by Sharon Keeler)

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 were talking to a real space traveler!

Rick Searfoss, center, a NASA astronaut, recently came to UNH to speak to students involved in the Project SMART Summer Institute. With Searfoss are, left, Barrett Rock, associate professor of natural resources and coordinator of the Project SMART environmental science sessions, and Subhash Minocha, professor of plant biology who heads the Project SMART biotechnology program. (Sharon Keeler photo)

Campus Journal July 23, 1992

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

1993

, 1993

Classroom of the '90s

Going Beyond Book Science

High School Students Try Hands-On Problem-Solving at UNH

URHAM — From phyto-
kton and satellites, to acid
and genetically engineered
s, high school students at-
ling a summer institute at the
versity of New Hampshire are
ning there's more to science
what they read in their text-
ks.

xty of New Hampshire's top
school students have given
hree weeks of their summer
tion to go back to school. The
ents, who have interests in
and science, are participat-
in UNH's Project SMART
ence and Mathematics
ievement through Research
ning), a program which aims
ducate and challenge them
nd their high school curricu-
, while acquainting them
the environment and re-
ces of the university as a
e for higher education and re
ch.

roject SMART is a course
ut scientific thinking and
blem-solving, says director
hash Minocha, UNH profes-
of plant biology. "Students at
ven grade level often learn 80
cent of their science knowl-
e from a single textbook," he
s. "The process of science
hing involves recitation, test-
and discussion of tests, all
ed upon the textbook materi-
Project SMART takes students
y from that mode of instruc-
."

he institute is an intensive,
ds-on experience where stu-
ts not only learn what the

UNH News Bureau

UNH GRADUATE student Becky Gamble, left, of Newmarket, and high school student Emily Hodgson of Manchester squeeze eggs from a female lamprey into a dish during a laboratory experiment at UNH's Project SMART summer institute. Hodgson and several other high school students are learning about the lamprey, a primitive eel-like fish whose lineage extends bck 500 million years, as part of a class on biotechnology.

current trends in various sciences are, but also gain historical and philosophical perspectives for understanding social and ethical issues raised by recent scientific development.

In Minocha's biotechnology program, for example, participants gain experience in the techniques of cell culture, cloning, DNA isolation and gene manipulation. Recent controversies such as those concerning genetic engineering, surrogate motherhood and biological warfare are also covered.

Other activities of the institute include ecology studies at the Isles of Shoals, environmental assessment activities on Mount Washington, reproductive research on lamprey fish, and field trips to Tufts University School of Veterinary Medicine and New England Biolabs.

Project SMART is a collaborative effort which brings together the expertise of several UNH departments and faculty members, and the experience of many graduate students. Participants choose between three areas of study: biotechnology, headed by Minocha; environmental science, headed by Barrett Rock, associate professor of natural resources; and marine and freshwater biology, headed by Alan Baker, associate professor of plant biology.

According to Minocha, it is hoped that, given the opportunity to explore careers in science and mathematics, many of these students will continue their education in these disciplines at the pre-college and college levels.

Most importantly, however, Minocha hopes the institute will help students to become scientifically literate citizens.

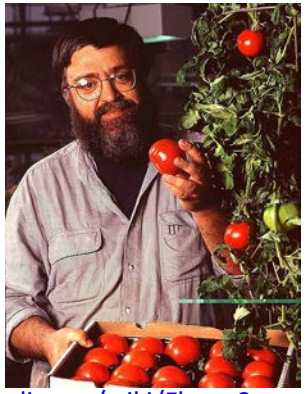
"When rockets and astronauts are sent to explore space, when the ozone layer is destroyed, when the water systems are polluted or new drugs and technologies are developed to diagnose and treat new and old diseases, it is not scientists alone who are involved; it is the public at large that must support such adventures," he says. "To participate in decision-making, we must understand the concepts and techniques of science."

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.



http://en.wikipedia.org/wiki/Flavr_Savr

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.

Project SMART Summer Institute

June 28 - July 22, 1999

2000

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)

Campus Journal August 4, 2000

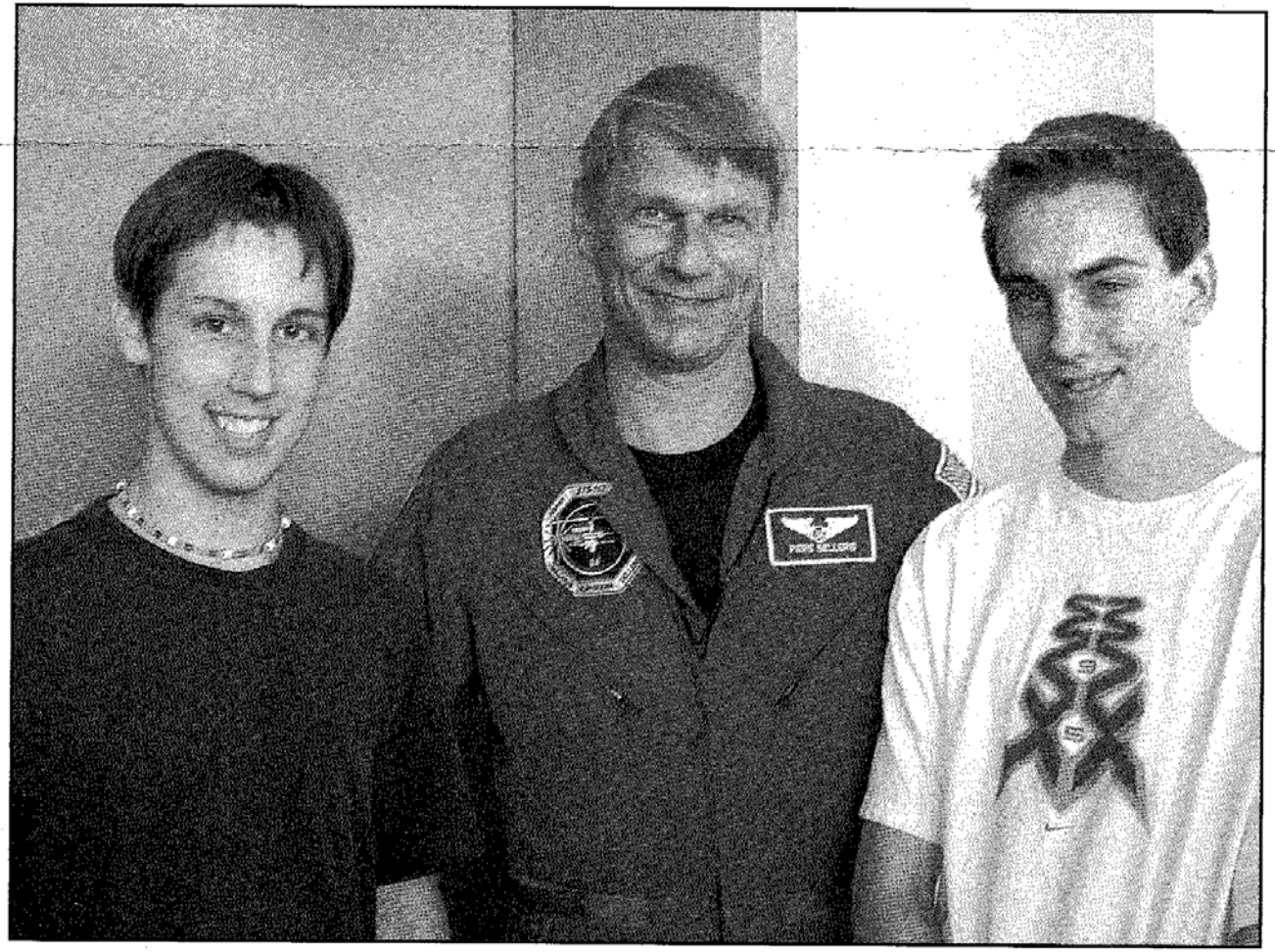
Project SMART swings into the Y2K with strong support of the administration (but with reduced funding), and looking forward to increase diversity of participants

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

The sky's the limit



Shuttle Astronaut Piers Sellers recently visited UNH's Institute for the Study of Earth, Oceans, and Space. Here he spends à few moments with two Project Smart students, Oliver Salmon (left) and Ryan Haley (right). (Kristi Donahue/ EOS)

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)

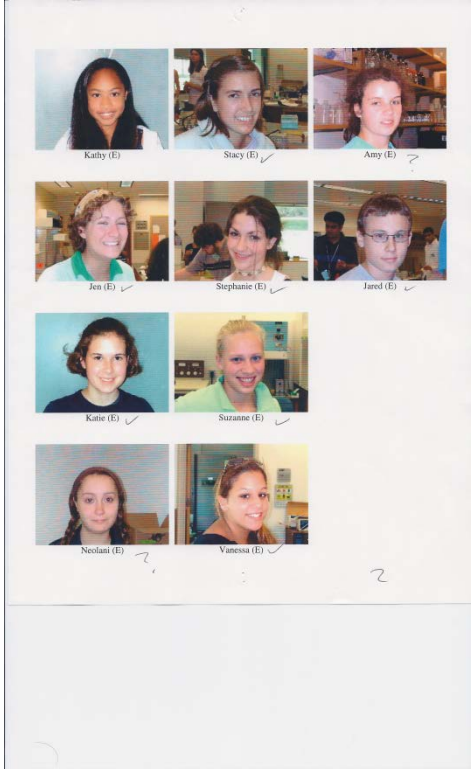
June 23 - July 18, 2003

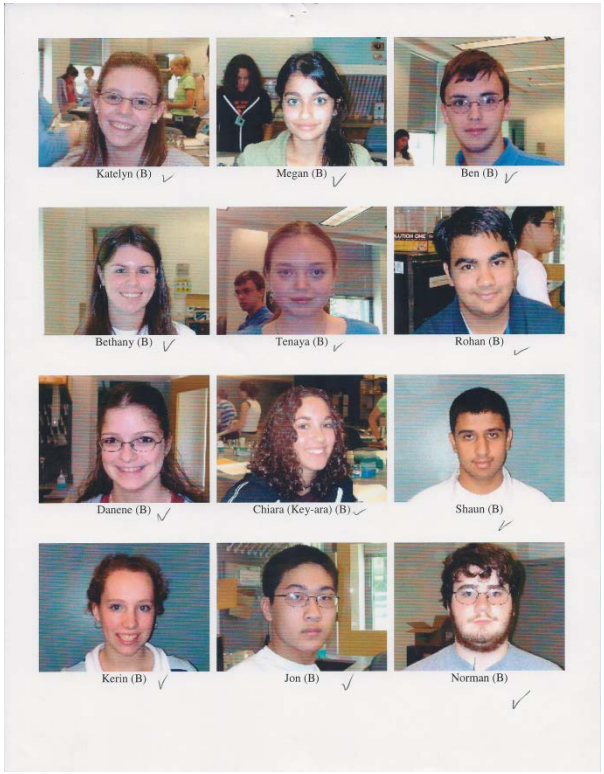
University of New Hampshire

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

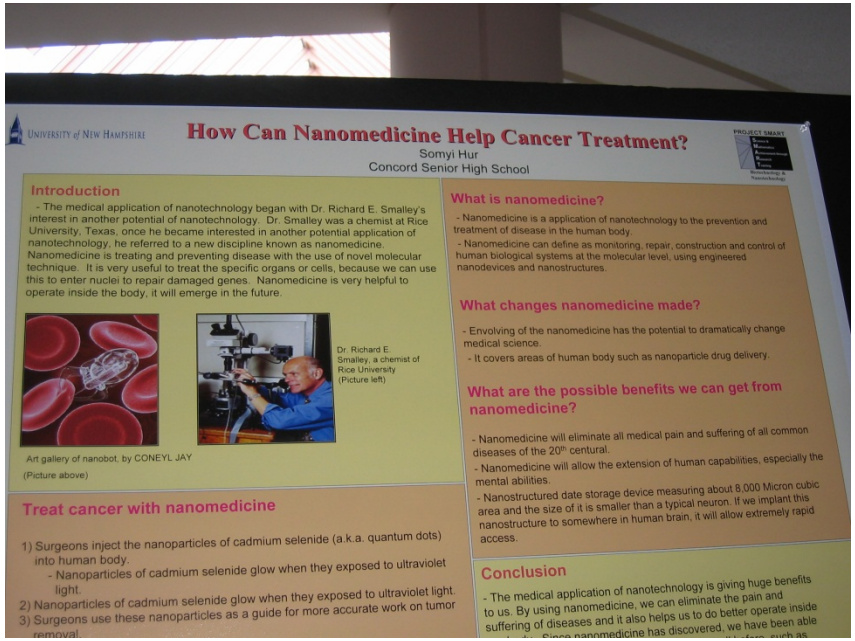
Students from Harlem Children Society in the Biotechnology lab studying chromosomes

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

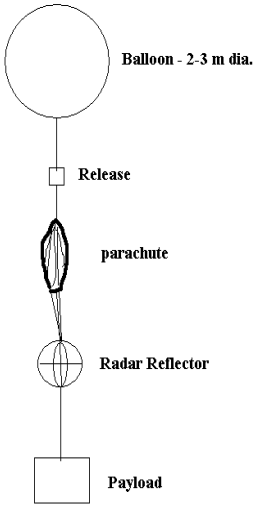


This image was captured by a video camera flown by high school students as part of the 2009 UNH Project SMART program, Space Science Module. The students were supervised by Lou Broad, a local high school teacher working in the program. They integrated the payload that included GPS and telemetry along 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

http://esp.sr.unh.edu/smart/smartpix/P1010132.MOV Open link to see Rocket test



- **2010-launching a balloon**
- 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).**

http://www.eos.unh.edu/newsimage/smart_balloon_lg.jpg

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

UNITED STATES SENATE
WASHINGTON, D. C. 20510

JUDD GREGG
NEW HAMPSHIRE

July 30, 2010

Prof. Subhash Minocha
Professor of Plant Biology and Genetics
105 Rudman Hall
46 College Road
Durham, NH 03824

Dear Prof. Minocha:

Please pass along my congratulations to each of the students participating in Project SMART. It is deeply satisfying to know a program started while I was Governor of New Hampshire continues to not just teach students about science and mathematics but to inspire them to excel in those fields. I want to thank the administrators and professors at UNH who have been leading this initiative during the last twenty years. Their commitment to the young people from New Hampshire and across the country is impressive and has reinforced the University's reputation as a center for academic innovation and distinction.

I am especially pleased to extend special recognition to the students. Their acceptance into Project SMART shows they already had a strong understanding of math and science. Their completion of the program's requirements demonstrates they are uniquely motivated to experience all the benefits it offers. As they move ahead with their education, I know this initiative will help open more exciting opportunities for them. Once again, congratulations and best wishes.

Sincerely,

Judd Gregg
U.S. Senator

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2011

M&E

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[1]

PICTURE 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

NEWS RELEASE

U.S. Forest Service, Northern Research Station

Contact: Jane Hodgins, 651-649-5281

"Project SMART Summer Institute" Receives Funding to Introduce Rural and Urban Youth to Environmental and Forestry Sciences

Newtown Square, PA, April 5, 2011 – The U.S. Forest Service announced Monday that Project SMART Summer Institute - 2011 has been awarded $30,000 in More Kids in the Woods funding to support environmental and forestry education and mentoring. The 4-week program provides young people more opportunities to experience the great outdoors, learn about nature, and build a lasting commitment to conservation and land stewardship.

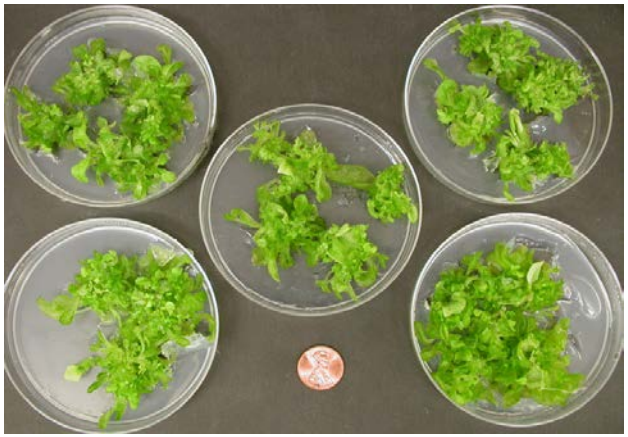
"The value of expanding our programs for children must not be underestimated," said U.S. Forest Service Chief Tom Tidwell. "Young people are tomorrow's stewards of our public lands, and we have a duty to help them develop a lasting connection and passion for conservation of America's great outdoors."

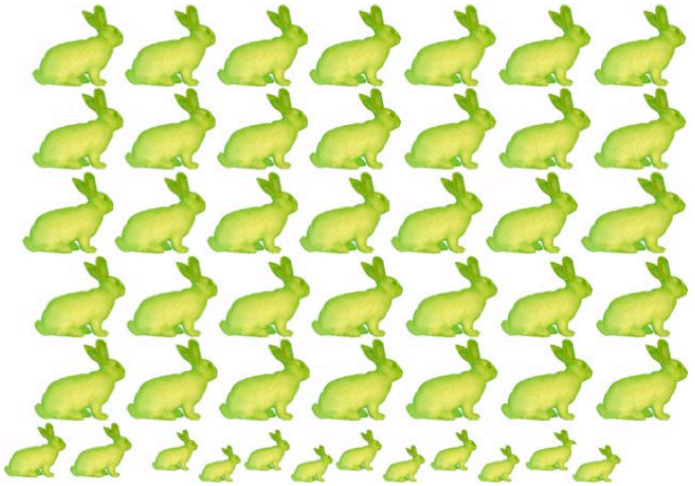
While one group tries to scale the altitudes of >2 miles into space with a balloon (Space science-2010 – balloon article), and the other attempts to get into the depths of our mind and the level of atoms and molecules (the biotechnology and nanotechnology - poster on mind changing hormones and nanotubes); 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)
- Integrated DNA Technology, Des Moines, IA (http://www.idtdna.com/site)
- Rural Alaska Honors Institute, University of Alaska, Fairbanks, AK (http://www.uaf.edu/rahi/)
- Summer Search Organization supports students to attend Project SMART (www.summersearch.org)
- Harlem Children Society, New York (http://www.harlemchildrensociety.org/)
- NH EPSCoR (UNH) http://www.epscor.unh.edu/
- Liberty Mutual Foundation - http://www.libertymutualgroup.com

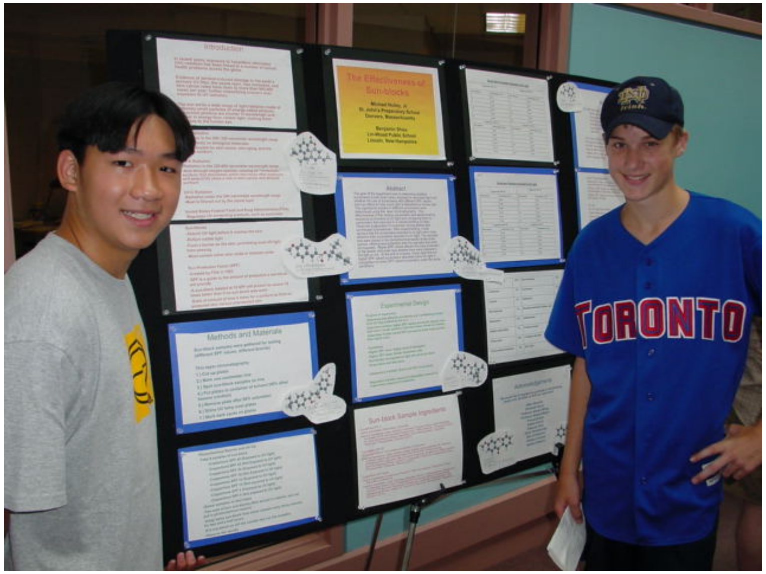


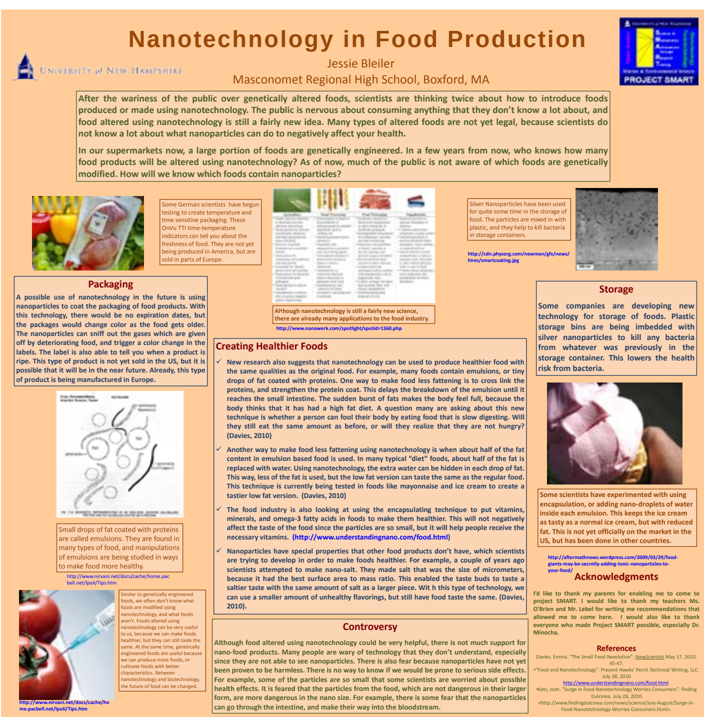


They clone plants and learn about cloning animals/humans – even chimaeras

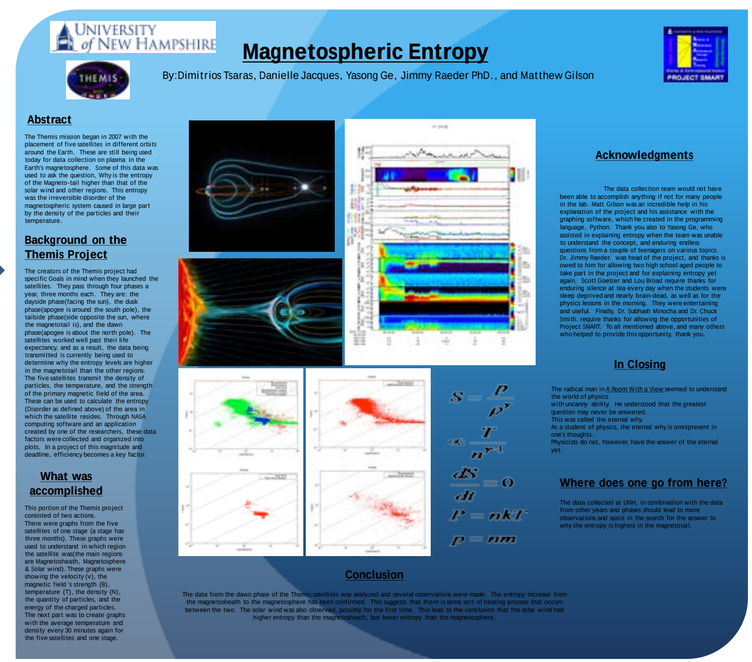
Some found an evening to visit the Minocha home

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.





Posters then (above - 2003) and posters now



They turned blue then (1998) and glow now: Genetically engineered bacteria produced by Biotechnology students

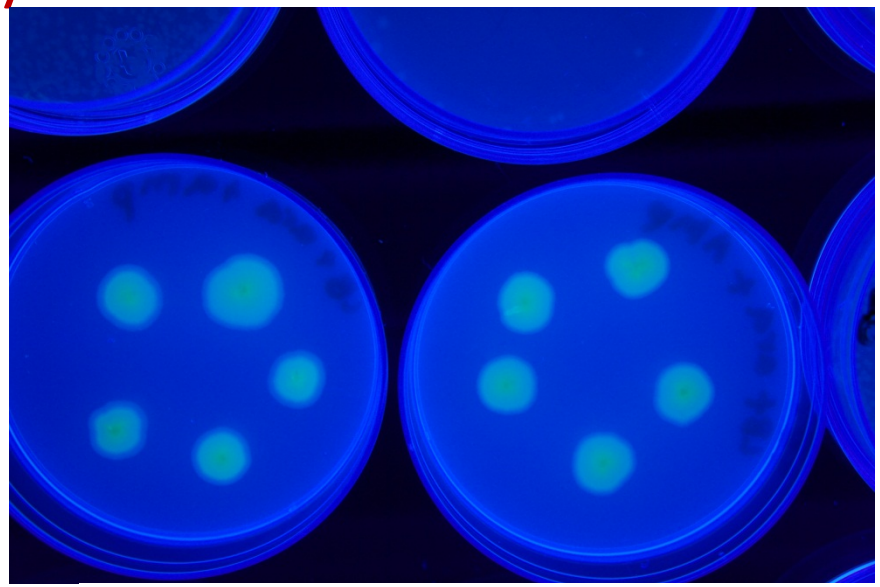


Figure 1. Transgenic pigs generated using an equine infectious anaemia virus-based lentiviral vector carrying the reporter gene encoding green fluorescent protein. Image courtesy of the Roslin Institute.

A happy bunch saying goodbye! Project SMART - 2011SMART

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?

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Harlem Children Society
"The Purpose of Souls is to Assist Each Other"
www.harlemchildrensociety.org

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