Abstract: ASPIRE is the Astrophysics Science Project Integrating Research and Education; funded by the National Science Foundation and the High Resolution Fly’s Eye Cosmic Ray Research Group. Since 1997, ASPIRE has been creating some of the Web’s most engaging and interactive science lessons and labs. In this poster, we will report on the most recent statistics from the website usage. In addition to creating and maintaining the website, ASPIRE provides direct outreach to local teachers and students. These direct outreach efforts include providing outreach to local groups underrepresented in the sciences, running summer workshop sessions for students and to the rural schools in Delta, UT where the new experiment is currently under construction.

The Astrophysics Project Integrating Research and Education (ASPIRE) has been the educational outreach program for the High Resolution Fly’s Eye Cosmic Ray Research Group (HiRes) at the University of Utah. Most recently, it has evolved to become the outreach program for the new Telescope Array (TA) Experiment. The HiRes/TA research group operates at the University of Utah, and is funded by the National Science Foundation. In 1997, the NSF charged HiRes scientists with forming an educational outreach program. A committee of scientists, educators and administrators held a summit to determine how HiRes could best serve K-12 educators and administrators.

At the end of the meetings, it was determined that the greatest need for science education outreach was at the middle school level. According to studies by Project 2061, a national science education reform panel, textbooks for science teachers and students at the middle school level have been found to be unsatisfactory [1]. Re-creating textbook situations was neither the answer to this complex issue, nor are classroom visits practical or possible by research scientists to an area as large as the Utah. A consensus was reached to provide the 7th, 8th and 9th grade teachers with online activities, so that they can benefit from the outreach program, regardless of proximity to the University of Utah.

A team was assembled with teachers, scientists, programmers and artists to produce web-based activities. The first ASPIRE lessons were produced as applets written in JAVA. One unique feature to these lessons, that is still difficult to find on the web today, is that the curriculum is integrated into a web-page that serves both as a lesson, and a laboratory activity. Instead of having a lecture day and then a lab day, the student experiences both together on the web. These lessons have been well received, and continue to be used in schools in Utah as well as nationally and internationally.

The benefits of using Java were immediately obvious. Students could virtually interact with the computer in a simulation that could not be easily or affordably reproduced in a classroom. Computers have an appeal that engages students, even those who otherwise may not participate in the classroom. Teachers could spend valuable classroom time answering the students’ questions about the lessons instead of lecturing. The lessons developed were designed to adhere to the standards and objectives set by national science education reforms, so that any teacher could feel comfortable utilizing these activities and know
that the students were exploring concepts and
ideas that may be found on an end-of-level test.

Since 2001, ASPIRE has migrated to producing
website content using Macromedia Flash. Mac-
romedia estimates that over 98% of web users
have the flash player already available on their
personal computer now, making accessibility to
the ASPIRE dynamic content easy and seamless.
At this time, ASPIRE averages over 3000 unique
IP visits daily. By producing online content that
supports curricula and educators, the ASPIRE
project reaches far more students than direct out-
reach efforts alone could hope to achieve.

In addition to providing this outreach to K-12
science educators and students, ASPIRE coordi-
nates local outreach efforts. These activities
include:

- Classroom visits
- Super Saturday, a day of educational
  presentations in Delta, UT (where the TA
  experiment is located).
- Arranging departmental tours for youth
groups
- Visits to the research facilities in the new
  Delta, UT area
- Science fairs and students designing sci-
  ence fair projects
- Local summer science camp presenta-
tions at the University of Utah – Club U
- Presentations for the local Utah Feder-
ation for Youth – a group for minority
  students in Salt Lake City
- Summer workshops for the ACCESS
  Women in Science group at the U of U
- Partnering with WGBH to supply mate-
  rials for Teacher’s Domain, a PBS en-
  deavor.
- Millard County Fair presentations by
  scientists and staff

The summer of 2007 is the inaugural year of a
summer workshop to be held in Delta, UT. Teac-
chers and students will work together to pre-
pare installations for museums, schools and the
Cosmic Ray center. These installations will be
tables constructed with a topographical and LED
display of the new Telescope Array experiment.
Each table will have the ability to receive actual
data from the array and display events as they
occur, or previously recorded events. This work-
shop will occur over 2 weeks where students will
learn not only about the Telescope Array project,
but also learn about electronics in the construc-
tion of these tables. Each student will receive
college-level credit from the University of Utah
for their efforts. These installations will have a
long-term impact in the communities where they
are placed. This workshop will not only benefit
the participants who create the tables, but also the
areas in/around Delta, UT where the Telescope
Array is located.

As an outreach program, ASPIRE has been able
to effectively and affordably have a great impact
for a number of students and educators both di-
rectly and indirectly with the website and local
outreach efforts. The success of the ASPIRE
program can be directly attributed to it’s ability to
reach a large audience with a relatively low over-
head.

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