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Schools Working for Academic Excellence

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Summer 2004



GOSPEL: The BHS Jazz Choir, performing in the nave at the Riverside Church in New York City, site of the March 26th Heritage Music Festival.

Music Competes at National Event

by Scott Burditt

More than two hundred Bangor High School musicians competed at the national Heritage Music Festival in New York City. Each of our eight performing groups played for a panel of nationally known judges, receiving valuable critiques and comments. Students also saw sights in the city and attended several Broadway shows *(Continued on page 14)*

Bangor Launches Pre-K Program 2004-2005 to see pilots in three schools

This fall, three Bangor schools will open pilot Pre-Kindergarten programs alongside regular classes. These Pre-K pilots will have limited enrollments; students will be randomly selected from the pool of applicants. The Pre-K program will serve children who have turned four prior to October 15, 2004. The program is designed to provide pre-K opportunities for the growing number of Bangor children who would otherwise enter kindergarten without attending pre-school. In the past year, as many as 50% of students entered kindergarten with no prior pre-school experience.

Pre-K instruction will be strongly oriented toward building language skills and quantitative concepts through an active and experiential class structure. Social skills of classroom interaction will be emphasized. Importantly, the classroom will be educationally focused, even in play activities. Lastly, the program will provide regular out-of-class activities designed to broaden children's awareness of their community, including field trips to the grocery store, airport and library.

Downeast School will be home to both morning and afternoon Pre-K pilots, while Vine Street School and Abraham Lincoln School will each host morning sessions. Each class will be instructed by a certified early childhood teacher.

Special Feature: Space Studies

The Stars in Bangor Schools

Through a series of developments across Bangor's K-12 curriculum, space, the stars and an understanding of the universe in which we live has become an increasingly important and exciting feature of the instructional landscape in Bangor Schools. The construction of the observatory at Bangor High School, the opening of the Challenger Learning Center in Bangor, NASA training opportunities pursued by Bangor faculty and a passion for space studies held by many teachers across the school community have combined to create a coherent progression of student experiences that provide Bangor students with a truly unique opportunity to explore their universe. This feature documents this constellation of experiences across Bangor Schools, showcasing the events that have punctuated space studies this year, as well as demonstrating the place of space studies in the K-12 curriculum. The Communique thanks the many contributors who submitted materials for this feature.



STELLAR EYEBALL: The Ring Nebula as observed through the 12-inch Newtonian telescope at BHS.

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Space Station "Lands" at Fairmount

by Ellen Holmes

On January 15th, Fairmount School participated in a prestigious event, linking students via satellite feed to the International Space Station. In preparation for this big event, students researched the International Space Station and life in space. Classes also prepared questions for the astronauts.

Fairmount students packed the school gym. Community members and Maine legislators also attended. Suddenly, a dramatic voice came through the speakers. "This is Mission Control in Houston, are you receiving?"

During the live feed, two astronauts spoke with students through real-time video. The astronauts fielded 25 questions. Between responses, the microphone floated between the astronauts. Students inquired about such topics as the scientific experiments conducted aboard the ISS, day-to-day life at the station and the "earthly" things the astronauts missed most.



LINKED: Robin Kennedy, Flight Director at Challenger Learning Center, and Mike Michaud, US Representative, joined Fairmount students for the International Space Station satellite link up. Students included (back row, left to right) Zakiah Meeks, Kiersten Currie and Megan Six as well as (front row, left to right) Kathryn Laverdiere and Holly Legere.

Bangor Students at The Challenger Learning Center

Students Inspired to Explore Space

by Kris Reid

"You have to have good listening skills to get something exactly right."

"You have to work together more than anything else."

"I wonder if I could do that type of job when I grow up."

"I hope they build onto it. I want to go to summer camp and learn more."

"If I get to go on another mission I would savor the moment so it would last."

"I am so interested in learning if the real Stardust Mission will let us study real comet dust? I would like to study this in the future."

Relevance. Resources. Application. Inspiration. Communication.

The sixth grade year is full of experiences designed to promote communication skills, a sense of community and academic and social independence. The science curriculum is a perfect place to hone these skills. There are few sixth grade educational experiences as exciting and well-suited to teaching these skills as The Challenger Learning Center mission, *"Rendezvous with a Comet"*.

Space in the Sixth Grade Curriculum

Sixth graders study space science as one component of a broader survey of science concepts including life science, chemistry, electricity, energy and motion, light, meteorology, forces of nature shaping our earth and plate tectonics. Until this year, the study of space has centered on the origins of the universe, stars and exploration of space. The possibilities have been greatly enhanced by the opening of the Challenger Learning Center. Not only do our students learn more about space, they use skills and information from all areas of the curriculum to 'fly' a mission to a comet.

The Challenger Center provides teachers with training, lesson plans and activities to prepare a class for a thrilling culminating activity. Prior to visiting the Challenger Center, students researched and investigated comets. Documenting sources and organizing new information became relevant to their mission. Watching a class eagerly calculate the eccentricity of an elliptical orbit was a joy to see. Navigating using coordinates on a four-quadrant grid became essential to the completion of their mission. Students were inspired to learn because of the immediate relevance.

Student skills were the criteria for getting a "job" on the mission. Each student applied for a position by demonstrating the qualities

necessary for the job. Navigators need math skills. Communication and Data positions require strong reading and writing skills under pressure. Remote and isolation stations demand good eye-hand skills for operating robotic arms. Every position is filled with eager, skilled astronauts. Each student has a mission patch designed by the class. At this point, each student is no longer a sixth grader. Now the class is filled with astronauts, scientists and mission specialists!

The task is to successfully fly a spaceship into space where a probe is built and then launched to intersect the tail of a comet. The probe will collect particles from the comet and allow scientists to analyze the possible origins of our solar system. This requires a competent core of astronauts on the spaceship and at mission control. Working as a team in a realistic simulation, the students complete the task, solve problems that appear along the way and return to the cheers of their teammates. After debriefing, every sixth grader leaves more knowledgeable about the universe and inspired to explore, to discover and to apply learning to real life situations.



MISSION CONTROL: COM officer Ashley Higgins (right), NAV officer Bernard Wu (below right) and REM officer Travis Shapira (below left) perform their jobs at the Challenger Learning Center simulation, *"Rendezvous with a Comet"*. 6th graders from both middle schools participated in the simulation this spring.



RENDEZVOUS WITH A COMET

by Paula Leavitt

"Your mission is to find a comet and then to launch a probe from your space shuttle to collect particles from the comet's tail. Your counterparts at Mission Control will assist you. Both of you have been trained to carry out this mission; it is up to you." This is your directive if you are a sixth grader at the Challenger Learning Center.



The Challenger Learning Center's comet simulation is extremely realistic. The mission cannot be completed without training and knowledge about comets. Students must understand the tasks necessary to complete their mission. They apply for the following positions: communication (COM), data (DATA), navigation (NAV), remote (REM), isolation (ISO), life support (LS) and medical (MED).

The COM Team is responsible for oral communication between Mission Control and the shuttle. DATA requires written language skills for written communication. NAV launches the probe in its correct trajectory. REM works within a glove box to check the condition of the food supply, which has an infestation of insects. ISO maneuvers a robotic arm to handle potentially hazardous materials like meteorites. LS monitors the oxygen content, humidity and pH

of the shuttle environment. The MED Team is responsible for monitoring the health of the crew by checking blood pressure and reaction times of crew members.

These jobs require a lot of academic skills. "A space mission," said Bangor 6th grader Mariah Cassum, "involves a lot [of] things like teamwork and communication." Students stated that they needed "patience, listening skills, careful reading and specificity when communicating." Not only do students have to be prepared for one job, but midway through the mission, the Space Shuttle and Mission Control Crews switch places.

Doughty School 6th grader Cayla Sirois realized that, "In space, you can have a lot of emergencies." Not every mission goes perfectly. Yet if crews problem-solve together, even mistakes can turn out for the best. "If you make a mistake," said student Justina Ventucci, "it might be a good thing; one group found a comet."

Students were impressed with the realism of the simulation. "Mission Control makes you feel like you're running it all," said Desi Clark. Sydnee Blouin said, "On the shuttle, you feel like you're making the decisions."

At least one student, Chris Lowe, thought he could be an astronaut someday. Anything is possible especially, if you remember Keith Austin's quote he prepared for his arrival in space:

"You accomplish goals not by chance, but by preparation."

Space Studies in 4th and 5th Grade

by Ellen Holmes

Over the last three years, Fairmount School has taken part in many exciting events centered around the theme of space. Many teachers in the 4th and 5th grades have taken advantage of these opportunities by integrating a space theme into their curriculums. Classroom activities have included studying the planets, stars, phases of the moon and space travel. Teachers have used many resources, including software, NASA resources and a great collection of non-fiction books in the library.

Each year, students at Fairmount School have been visited by Aerospace Education Specialists from Goddard Space Flight Center. They have talked with these educators about how humans live and work in space. The specialists have shared space suits, space gloves and explained how astronauts eat in space. Their visits include videos and slide shows designed to excite students' imaginations while punctuating the need for students to do well in math and science so that they can take part in the future of space travel.

Last year, Fairmount School hosted the Starship 2040, an elaborate exhibit of what a future spaceship might look like in the year 2040. Students and the community

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Stellar Excitement at Fairmount

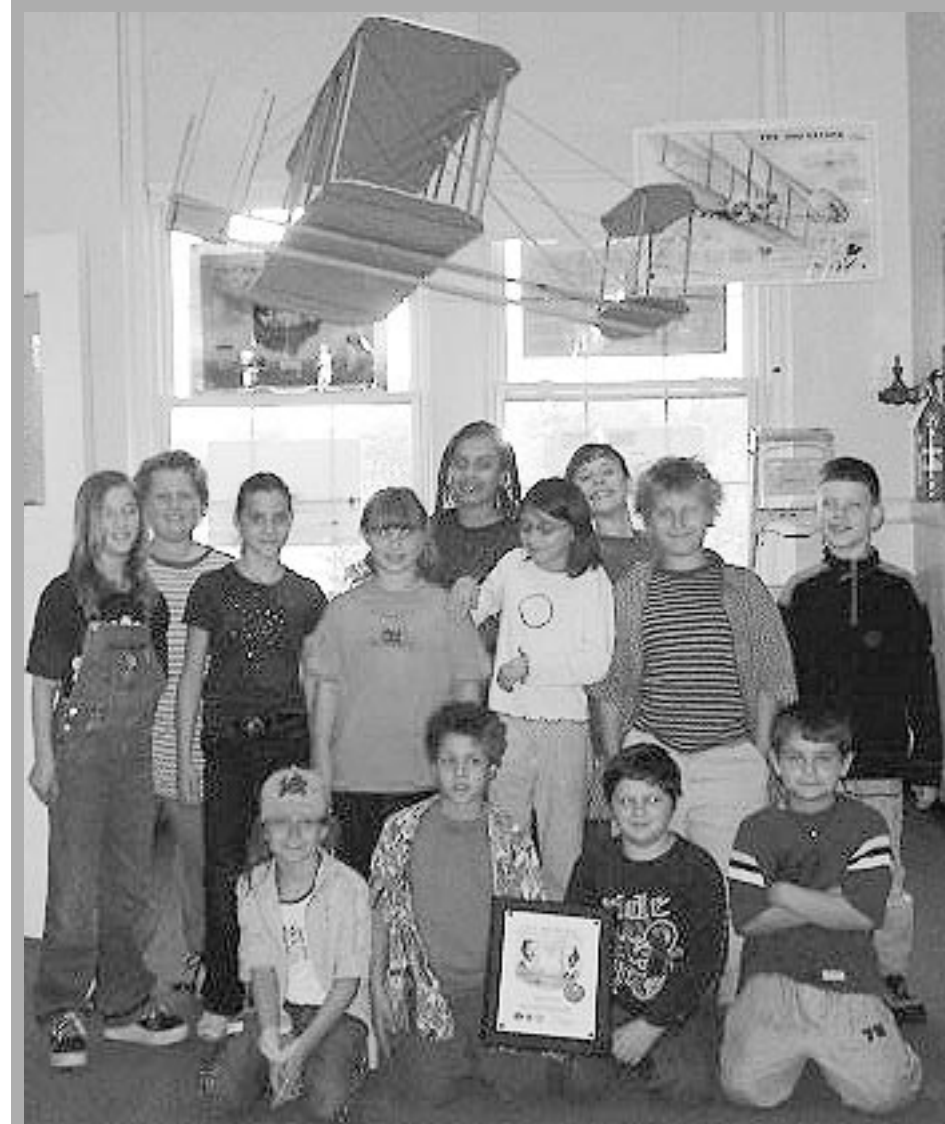
by Ellen Holmes

May 3rd, 2004 was formally proclaimed Space Day by Governor Baldacci at a special ceremony celebrating space exploration. In honor of the Fairmount School's active involvement in space studies, two Fairmount students, Cody Bubar and Crystal Curtis, attended the ceremony held at the state capital.

The end of the year was no less exciting for students at Fairmount Elementary. Amy Stoyles, a NASA researcher just back from Antarctica, visited Fairmount classrooms. One of NASA's primary missions, besides exploring outer space, is to study our own planet. Fifth grade students study biomes; Ms. Stoyles stories about her experiences in Antarctica helped students understand that dramatic biome.

A fourth grade classroom was visited by a NASA scientist who uses satellite data to track the health of rivers and streams in Maine. This visitor helped students understand how salmon that students raised in their science classes will fare after release into the Kenduskeag Stream.

(Continued on page 14)



GLIDERS: Fairmount students won a national competition for their scale reproduction of the Wright Glider built from original blueprints and measurements. The contest was part of NASA's yearlong Centennial of Flight program.

8th Grade Teachers Add Astronomy

by Carolyn Vose and Dave Robinson

What causes tides, moon phases and eclipses? How did the solar system form? How big is a galaxy? Eighth grade science faculty from Cohen and Doughty Schools have developed a new instructional unit, "An Introduction to Astronomy", to help students answer these questions. This two-week unit focuses on student awareness of our place in the universe and on the enormous distances and time frames in astronomy. This unit entails many applications of physics concepts taught in the grade eight science curriculum.

The curriculum begins with a study of the earth-moon-sun relationships, which explain the length of days, years, moon phases and eclipses.

Students then explore our solar system's planets, asteroids, meteors and comets, as well as the remarkable astronomical objects outside of our solar system such as nebula and black holes. Stellar evolution and theories of the universe's creation and expansion

are also examined in the unit. The entire unit is supported by hands-on lab activities. Multimedia models help explain the concepts of space, time and distance. Physical science phenomena such as gravity, the life cycle of a star and the behavior of light feature prominently in the unit.

To realize the sense of scale of the solar system, students walk through a solar system constructed of scale models of the planets separated by the appropriate scaled distances. Students also cook up a comet and inflate the universe. Students visited astronomy web sites to calculate their weight on other planets and identify types of stellar formations including star clusters, nebulas and galaxies. Students also observe the changing phases of the moon though one month and keep current on astronomy news online with NASA's "Photo of the Day". Students were also encouraged to observe the night sky through out the school year.

BHS Astronomy Program is Born

by Al Banfield

The heavens greeted Bangor High's nascent astronomy program with spectacular events this year. Mars welcomed the program just days before the start of school with its closest encounter with Earth in 60,000 years. The red planet maintained its presence in the sky for several months, providing excellent viewing for students using the program's four new portable telescopes. A transit of Venus, an event that occurs only 81 times in 6000 years, capped off the school year on June 8 as Venus crossed in front of the Sun.

The late October skies were illuminated with the red and green of a potent *aurorae borealis*. To study the solar storms that caused the Northern Lights, "Little Red," a trusty telescope fitted with a solar filter, was called into action so students could safely view solar flares during the day.

Discoveries and man made events were also of major interest. Students used NASA Internet sites to follow the Mars Rovers closely, as they searched for Martian water. The Stardust spacecraft flew

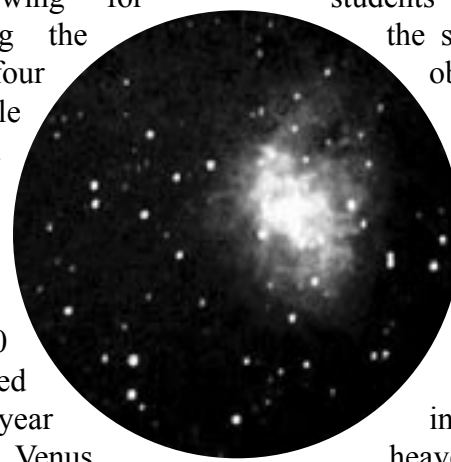
through the tail of comet Wild 2. Scientists also discovered an icy planetoid, Sedna. The comet probe and planetoid discovery prompted discussions on whether Pluto fits the definition of a planet or whether it is more like an icy big brother to Sedna.

Bangor High's first astronomy students began their study of the sky with "naked-eye" observations, becoming familiar with the constellations that serve as a roadmap for locating celestial objects.

Our four portable telescopes allow students to investigate some of the heavenly favorites, such as the rings of Saturn and the four Galilean moons. These compact yet powerful telescopes let students complete tasks at home, often on weekends, widening the window of opportunity for clear viewing. While portable telescopes can view nebulae, star clusters and galaxies, the province of deep space observation resides in BHS's prized 12-inch Newtonian telescope housed at the school's observatory.

The computer-operated telescope collects the faintest of

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Music Competes

(con't. from page 1)

On average, our groups perform more than fifty times each year, both in and out of state.

The Bangor High School Music Department offers a wide variety of programs each year. The most visible of these are our performing groups, which include the Chorus, Chamber Choir, Concert Band and Orchestra. Each of these ensembles meets daily, preparing music of various styles and historical periods. Three extracurricular ensembles, the Jazz Choir, Jazz Band and Fiddlers, rehearse in the evenings. Open to members of the Band, Chorus and Orchestra, these groups also perform throughout the year and participate in juried Music Festivals.

In addition to performing groups, we offer classes in Music Theory, Solo & Ensemble and Music Literature & Listening. The Solo & Ensemble course allows students to form small groups for the purpose of performing chamber music and/or solo literature. The course focuses on the improvement of the individual's instrumental technique, small group rehearsal procedures, expansion of repertoire and regular class recitals. Public performances are possible, depending upon interest and skill level.

Music Literature & Listening is an introductory course designed to give students an overview of musical styles, performers, composers and instruments. Topics include music from our culture, music of other cultures, perceptive listening skills, musical theater, film music, the history of Rock & Roll and the history of Jazz.

For students with little or no knowledge of the fundamentals of music, we offer Music Theory 1 and 2. Topics include the rudiments of music, study of notation, scales and key signatures, chords and chord progressions, ear training and musical form, culminating in original composition.

We would like to thank the citizens of Bangor and the administration of the Bangor School Department for their continued support of the performing arts programs here at Bangor High School.

FLUTTERBYS: Butterfly prints by second grade students at Downeast School.

NOTICE

What's Next For Me?

Questions for Students with Disabilities & Their Parents

by Cindy Tuck

The Penquis Regional Transition Council asks students with disabilities and their parents:

- Do you need assistance transitioning from high school to life after high school?
- Do you have questions about employment, housing, community participation, social security, guardianship, medical and health coverage, and independent living?
- Do you want to know more about the difference between entitlement and eligibility?

If you answered yes to any or all of these questions then you may want to contact the **Penquis Regional Transition Council** located at 141 North Main Street, Brewer, Maine.

The **Transition Council** holds monthly forums which provide information on these topics and more. Contact **Cindy Tuck** at 992-2270, or schooltolife@midmaine.com to find out when and where the next session will be held.



Stellar Events

(con't. from page 9)

Finally, a bit of space history was celebrated on June 4th. Grace Corrigan, mother of teacher-astronaut Christa McAuliffe, delivered a powerful message about setting goals and working to achieve them. As many adults know, Ms. McAuliffe was the school teacher selected for the astronaut corps who sadly lost her life in the Space Shuttle Challenger explosion in 1986. It is important for students to know that despite adversity, the need to explore, dream and create lives on. Mrs. Corrigan was accompanied by active astronaut Keith Reightler, who has logged over 300 hours of flight in space.

In sum, the study of space in fourth and fifth grade goes beyond learning the nine planets. Students come to know the faces and work of the men and women who put their lives on the line to help us understand the world we live in and beyond.

BHS Astronomy

(con't. from page 9)

light from deep space objects to capture colorful photographs. The students can view the brilliant red and green hues of nebulae as they investigate the birth of stars, as did senior Brienne Cressey. Kyam Kreiger and Matt Ireland studied variable stars as an independent project using the telescope.

The 12-inch telescope's field of view is so narrow that viewing close objects like the moon is problematic. The bright glow of the moon can also overwhelm the camera unless a strong filter is inserted. To overcome these obstacles, juniors Matt Ireland and Graham Fitch, photographed the moon in ten segments, then pieced together the parts to create a digital mosaic of the moon.

In 2004-2005, the astronomy program will offer two daytime sections and a night school session. Instructor Alfred Banfield will attend a NASA summer institute at the Goddard Space Center through a grant from the Maine Mathematics and Science Alliance to enhance his skills and improve the program.

Fairmount Space Studies

(con't. from page 9)

toured the vehicle and learned about space travel. In conjunction with the Starship's visit, Fairmount received a visit from Dr. Christine Barrett, a leading NASA engineer in the space flight directorate. She traveled from Huntsville, Alabama to tell students about her work. Her talk pointed out the importance of creativity and imagination to solve problems like traveling to other planets.

Many students were inspired by Dr. Barrett's presentation to create their own space vehicles of the future and enter them in the American Institute of Aeronautics and Astronautics "Highway to Space" Art Contest. A.J. Zezima placed third in this national competition for his drawing of an "Intergalactic Big Rig."

2003 marked the Centennial of Flight, a worldwide celebration of the 100th anniversary of manned, powered flight first achieved in Kittyhawk, South Carolina by the Wright Brothers in 1903. Fairmount School and Mary Snow School both participated in a glider design challenge. Classes used resources donated by NASA to engage in the engineering process. Their goal was to design and construct gliders that could travel the longest distance. At Fairmount School, the winner of this contest was Garrett McDougall.

As part of an ecosystem study, Mrs. Holmes' 4th grade students used satellite data to track seasonal changes in a small patch of land near the school. They studied the various plant and insect species, and kept careful track of temperature changes as well as changes in the length of day. Students created a detailed map of the area. The entire project was submitted to the Civil Air Patrol. For their work, students will receive a national award.

Last June, as two space vehicles sped toward rendezvous with Mars, students at Fairmount School met with an exciting young scientist named Leesa Hubbard. Ms. Hubbard talked about her work with the rovers and showed different types of rovers planned in the future. Ms. Hubbard stressed once again the importance of working hard in school now so that students could reach for their dreams in the future, a recurring message for Fairmount students as they experience space in the curriculum.