



by Walter Reil

Let's talk space exploration, but this time in terms of science education and music. And, let's bring it home to the Central Coast, where some phenomenal action is occurring that few people know about. We need to celebrate what our young people are going through and accomplishing in their push to learn and be the best.

It is a pleasure being a contributing writer for the wonderful CCFN. My first article published in March 2009 was rather formal, introducing the grand picture of our breathtaking universe and space exploration. This time, I wish to bring the subject closer to home, and put a personal face on it.

Humans are born with curiosity, reaching out, touching, and crawling everywhere to personally visit things. As we grow, we see new things and have new experiences, learning as we go. In essence, from day one we are reaching for the stars, wanting and craving to touch, hear, see and smell new things.

When we go to the beach, we explore the sand, venture into the water and study and touch interesting objects we encounter; rocks, shells, seaweed, driftwood, and sea life. If we see a large rock outcropping ahead that is blocking our view and progress up the beach, we want to crawl around or over it to see what is on the other side, investigating tide pools along the way. Welcome to human exploration in one of its simplest and most enjoyable forms. This is a very profound moment, as we recognize that human beings will push to see and understand the unknown, sometimes taking risks in doing so.

Now step into our K-12 school years. It is here that wonderful teachers work long hours to bring out the best in us, to excite us, to kindle the fires of imagination and curiosity, and to instill in us a sense of adventure, determination, and commitment to learn new things. Doing this is not easy. It is very hard work, for both teacher and student, that requires vitally important support.

As scientific research has strongly demonstrated, one powerful area of support for many children as they work to achieve academic excellence, is the joy of musical performance. For many students, this takes the form of instrumental music, playing the piano or some other form of musical instrument in band. Unknown to many people, instrumental music performance is an extremely powerful tool for enhancing the mind's ability to grasp, learn, understand and retain complex subjects, particularly math and science. This is why there is a very high percentage of high school graduates having high academic achievement who had significant involvement in instrumental music.

For many of these students, it is a core factor in their enjoyment and mastery of difficult and challenging courses in math and science. This is critically important for our nation to understand. This is why there is strong resistance by many families in our nation to allowing our schools to reduce or eliminate music programs. Music is food for the mind and soul.

I know this from first-hand experience with one of my daughters, Robin, who has one year remaining before graduating from Cal Poly SLO. She

found instrumental music to be an essential partner as she faced rigorous and demanding academic studies. Many of her friends are in the same position, excelling because of their support structure of music performance and their network of music friends. Robin started instrumental performance in 3rd grade and has continued into her final year of college. This has become her rock-solid foundation for life. This has been a powerful factor in her high academic achievement throughout her high school and college years. Musical performance is invaluable to a very important segment of America's student population.

On another topic, I am excited about something happening locally in science education that is having a profoundly positive impact on local students. One area of study that is becoming very popular for students pushing the limits of interest in science, is an astronomical course for college and high school students taught by Dr. Russ Genet at Cuesta College. Both high school and college students are performing investigations in astronomical research, resulting in their names being included in published professional scientific reports. Larger universities are taking serious notice of this, desiring to enroll students with this kind of research experience and accomplishment. Such scientific educational achievement by high school and junior college students is opening university doors that otherwise could be closed to them.

Now, let's move on to university science education at Cal Poly, San Luis Obispo. In August my daughter Robin, who is a senior majoring in Physics, worked with fellow physics student Ali Goodsell, under the direction of Dr. Thomas Gutierrez, supporting neutrino energy research at the Gran Sasso National Laboratory in Assergi, Italy. This is the largest underground particle physics and nuclear astrophysics research facility in the world, located 4,600 feet beneath a huge mountain. To follow what they experienced, see the website at <http://www.fix.net/wreil/Gran-Sasso-Trip.htm>. These students are receiving the education of a lifetime thanks to the extremely high and demanding expectations of Cal Poly educators and the generous and vital support of the National Science Foundation.

In closing, I want to relate a very powerful story of a young girl who definitely has her eyes set on the stars because of her family upbringing and public education. Twelve-year-old Clara Ma from Sunflower Elementary School in Lenexa, Kansas, recently won a national NASA competition to name the Mars Science Laboratory rover, a 2,000 pound spacecraft that will soon launch to Mars. As her prize, the Disney Corporation paid all expenses for Clara and her family to visit NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California. Covered from head to toe (including face mask) in a white "bunny suit" in a JPL clean room, a very excited Clara stood beside the spacecraft, signed her name on a special nameplate, and officially named it "Curiosity." Here is what she said in her essay to win the competition:

"Curiosity' is an everlasting flame that burns in everyone's mind. It makes me get out of bed in the morning and wonder what surprises life will throw at me that day. Curiosity is such a powerful force. Without it, we wouldn't be who we are today. Curiosity is the passion that drives us through our everyday lives. We have become explorers and scientists with our need to ask questions and to wonder." For more on Clara's story, go to <http://www.jpl.nasa.gov/news/news.cfm?release=2009-089> and <http://www.jpl.nasa.gov/news/features.cfm?feature=2181>.

Programs and experiences like these are producing America's future engineers, scientists, and leaders. They are America's future. These students, and many others like them who are pushing the limits and reaching for the stars, will become the key foundational structure for our nation, and all because they were encouraged and nurtured in their education beginning early in elementary school. As Americans, we must, at all cost, provide the finest and most rigorous education possible for our children. Their future accomplishments will be "music to our ears." Our children are America's most valuable natural resource.

Walter Reil is VP of Communications for the Central Coast Astronomical Society and a Volunteer NASA JPL Solar System Ambassador. He can be reached at 466-0757 or ccas@ccastronomy.org.