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# AstroCappella — A Musical Exploration of the Universe

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## Singing about Science

Songs about solar fusion? Doppler shifting ditties? While the idea of upbeat pop songs that are rich in science content might seem incongruous, a rocking band of techies with deep roots in the space science and education communities has melded music and science into the classroom-friendly AstroCappella Project. The Chromatics, an a cappella vocal band made up of astrophysicists, aerospace engineers, and other high-techers, has just released their 13-song CD/CD-ROM AstroCappella 2.0, which is the culmination of more than three years of collaborations with teachers, students, and fellow scientists.



The AstroCappella songs take the listener on a journey which starts in our own solar system ("Nine Planets", "Sun Song", "Habitable Zone"), and ends up at the edges of space, time and gravity ("High Energy Groove", "Swift Song"). Along the way, listeners get tuneful introductions to the concept of light as electromagnetic radiation, spectroscopy, the Doppler shift, and the expansion of the Universe.

Each song has extensive background and supporting materials, accessible through a computer's CD-ROM drive. These include self-guided activities, complete lesson plans, slide shows, science rock videos, beautifully illustrated background articles, and a glossary, as well as games and puzzles based on the content. A NAS (National Science Standards) map is included to make integrating the songs into the science curriculum a snap. The CD is packaged with a visually stunning 16-page illustrated lyrics booklet. The first pressing of AstroCappella 2.0 has already sold out; the second pressing has just arrived in the Chromatics' offices.

## What drives scientists with a beat to croon about the heavens?

It all began when serendipity and geography conspired in the makings of a DC-area



Alan Smale, Business Manager for the Chromatics is a NASA astronomer

contemporary a cappella group. Co-founded by an engineer and a comet researcher, the Chromatics drew its members from the science and technology fields. By 1997, the group included several astronomers, engineers, computer systems administrators and a NASA budget analyst. The seeds for spacey science songs had been planted.

An equal commitment to a career in astrophysics and a desire to communicate the wonders of science to the general public led Padi Boyd to the NASA IDEA (Initiative to Develop Education through Astronomy) program in 1997. "When I was researching grants, I came upon IDEA — a small program that gives seed money to innovative astronomy educational programs," recalls Boyd. "In a conversation with fellow Chromatic Alan Smale, I brought up, almost as a joke,



Padi Boyd, astrophysicist, soprano, and originator of the AstroCappella concept

the idea of writing songs about astronomy and going for one of these grants. It was very tongue in cheek at the time, but once we started talking about it, we all started recalling entire Schoolhouse Rock songs from 15 years ago." The two X-ray astronomers did a little research and confirmed what they suspected already: that music is an incredibly powerful way into a person's mind and memory.

"It was one of those golden ideas that seems so obvious in hindsight," Smale adds. "Everywhere we looked, we saw how kids respond instantly to music, and how easy it is for Schoolhouse Rock (on one end of the spectrum) and advertisers (on the other) to get their message across in exciting and memorable ways using song. And we saw in adults how often an interest in music and an interest in science go hand in hand."

## Harmonizing with Science Educators

Boyd and Smale, who are both astrophysicists at NASA's Goddard Space Flight Center Laboratory for High Energy Astrophysics, joined forces with middle school math teacher Kara Granger, who was already working on educational projects within their lab. Together they came up with the concept of a short CD with five or so songs, and an activity to go along with each song, to be used in the middle school math or science classroom. In May of 1998, a modest six-song CD with minimal packaging and a six-activity booklet were distributed to teachers free of charge. The songs covered radio astronomy, the Sun, the Doppler Shift, the Hubble Space Telescope, the nearest stars, and X-ray and gamma-ray astronomy. Web designer and Chromatics member Karen Smale designed a content-rich Web site ([www.astrocappella.com](http://www.astrocappella.com)) as a companion to the CD where visitors can download audio files, lesson plans and more. The concept took off. To date, the group has distributed 10,000 copies of the original AstroCappella CD and booklet to educators around the world. Supplies of the first AstroCappella CD ran out in the middle of 2000.

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