

**Instructional Related Activities  
Report Form**

SPONSOR	DEPARTMENT
Jerry Clifford	Physics

ACTIVITY TITLE	DATE (S) OF ACTIVITY
Guest Musicians for Physics of Music class	Fall 2011

E-mail to the Dean's Office  
30 days after activity

**Activity Relation to Course:**

The Physics of Music course is designed to give a useful and fun understanding of music and sound for general education, physics and performing arts students interested in music and speech. The format includes lectures, demonstrations, and hands-on activities. After covering the basic foundations of sounds and music, the students investigate each musical instrument group, including percussion, plucked strings, bowed strings, air pipes, reed instruments, horns and the human voice.

My musical ability consists of playing the radio – and sometimes I get talk radio. To go beyond my playing happy birthday one note at a time, which is not always recognizable, I wanted professional musicians who could demonstrate their instruments with skill. Over the past four years, we have invited professional musicians who understand the art of their instrument to be guest presenters. The students find the professional musicians add greatly to their understanding of the individual instruments. This aspect of the course always rates highest on our end-of-class surveys.

**Description of Activity:**

As the students investigate each musical instrument group, the guest musicians show the students how the instrument is constructed and how it can produce a variety of musical sounds. Having knowledgeable musicians share their intimate understanding adds immeasurably to the depth and breadth of the course. The live musical demonstrations integrate well with our active format of lectures, demonstrations, and hands-on activities.

Guest musicians for the fall semester were:

Dan Peyton invited the class for an evening session at Rock City Music Studio in Camarillo. Dan and his staff covered the plucked string instruments, including the acoustical and electric guitar and the banjo. Topics discussed during the two hours included:



- Show several string instruments, particularly looking at the construction and materials.
- Demonstrated the different sounds of a classical flamenco guitar with nylon strings vs. a steel-string guitar with brighter sound.
- Show three acoustic guitars that all had different sounds because of the sizes of the resonance boxes.
- Showed electric guitars with the many types and locations of magnetic pickups.
- Explain how you get different

sounds from instruments by playing in different locations and lightly touching the strings causing node points.

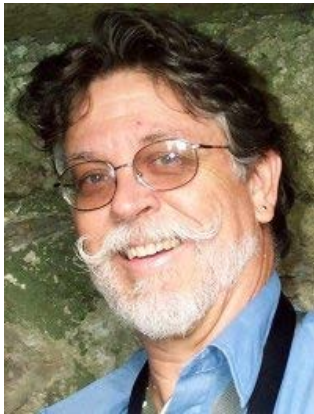
- Showed different techniques of playing for different genre of music.
- Show how plucking with fingers and picks gives different sounds.

Chris Banta brought in a home-made marimba and mesmerized the students with an outstanding performance. Chris showed how each bar is tuned by trimming wood from the lower portion of the bar. Specific harmonics for each bar are tuned separately by trimming in slightly different locations. Chris brought his frequency tuner to show how he zeros in on the note. He also showed how the individual resonating cavities are designed and built to fit underneath each bar. Finally he showed how the different mallets affect the sound. His music was a big hit, especially the bass marimba.



Steve Marsh played four saxophones, two flutes, a piccolo, and two clarinets. As a Los Angeles studio musician, he is expected to be very versatile with reed and edge-tone instruments. He said that he has to produce a myriad of sounds for movies, advertisements or other gigs. He showed the frequency ranges of the instruments and the ways that you can jump octaves. He showed how and why the mouthpiece for a saxophone or clarinet affects the sound. He talked about selecting and testing the reeds to get one or two good ones out of a packet. The students loved when he played the Pink Panther theme.

Chris Tedesco showed the various horns, especially the trumpet. He demonstrated the basics of horns using a piece of garden hose and a funnel. He showed how the three keys on the trumpet changed the length of the instrument – and thus the sound. He showed how differences in air pressure changed the tone from the fundamental frequency to the higher harmonics. He demonstrated over a dozen different mutes and discussed the kinds of music where a specific mute might be appropriate. The students were fascinated by the wide range of sounds produced by the different mutes.



James Browne is a barbershop singer and chorale director with a long history of singing. He engaged the students in a series of exercises to develop their singing voice. The exercises helped students understand the way a singer tunes his/her voice, particularly to achieve the “singer’s formant” which allows them to be heard unamplified about a full orchestra. Jim’s engagement of the students was lots of fun and very instructive.

At the end of the course, the students filled out questionnaires rating the guest musicians. On a scale of 1 (waste of time) to 5 (great presentation/performance), the student results are:

Guest	Avg	SD
Dan Peyton	4.4	0.7
Chris Banta	4.6	0.7
Ted Lucas	4.4	0.5
Steve Marsh	4.7	0.5
Chris Tedesco	4.8	0.6
James Browne	4.5	0.7
Paul Murphy	NR	

(Paul Murphy and Ted Lucas, as a members of the faculty, was not supported by IRA funds.) So the students found the guests to be an important part of the course.

### **Accounting:**

The musicians are paid directly from IRA funds. Each guest musician was paid \$200 for an hour presentation / performance. The total was \$1000 for the five musicians. The Physics of Music course was not offered in the spring semester so only half the 2011-2012 requested funds, \$2000, was spent.

### **Conclusion:**

The guest musicians are a valuable asset for the Physics of Music course and we hope IRA support will continue to bring these talented artist to CSU Channel Islands.