

CORE 103: THE PROCESS OF CHANGE IN SCIENCE**Professor Jack Feinberg, Department of Physics****Lecture** MW 2:00-3:20 pm**Lab** F 1:00-3:50 pm**The Physics of Sound: Hearing, Music, and Musical Instruments**

This course will explore the physics of hearing, music, and musical instruments. No previous physics background is required. You will learn the physics of coupled modes, non-linear systems, harmonics, and interference. Topics will include: the physics of sound waves, the anatomy and operation of the ear and the larynx, the perception of music including dissonance and consonance, different musical scales, the acoustics of concert halls, and the design and physical principles of musical instruments.

Students will build (and keep) a musical instrument of their choice. (Last year most students built electric guitars.)

The Friday labs will meet every other week. They will include two in-house lab experiments on waves and sound, and five afternoons for constructing, painting, and finishing your musical instrument. There will also be one all-day Friday (noon departure) field trip to The Integratron in Landers, California (near Joshua Tree), including dinner in the desert at Pappy and Harriet's. All supplies and transportation will be provided.

Required Readings

1) John Backus, "The Acoustical Foundations of Music, Second Edition," (1977).

ISBN-13: 978-0393090963.

(This book is widely available used for about \$10. But make sure it is the Second Edition.)

2) Arthur Benade, "Fundamentals of Musical Acoustics, Second Revised edition," Dover paperback (1990).

ISBN-13: 978-0486264844.

(Available new from Amazon for \$20, used for about \$4.)