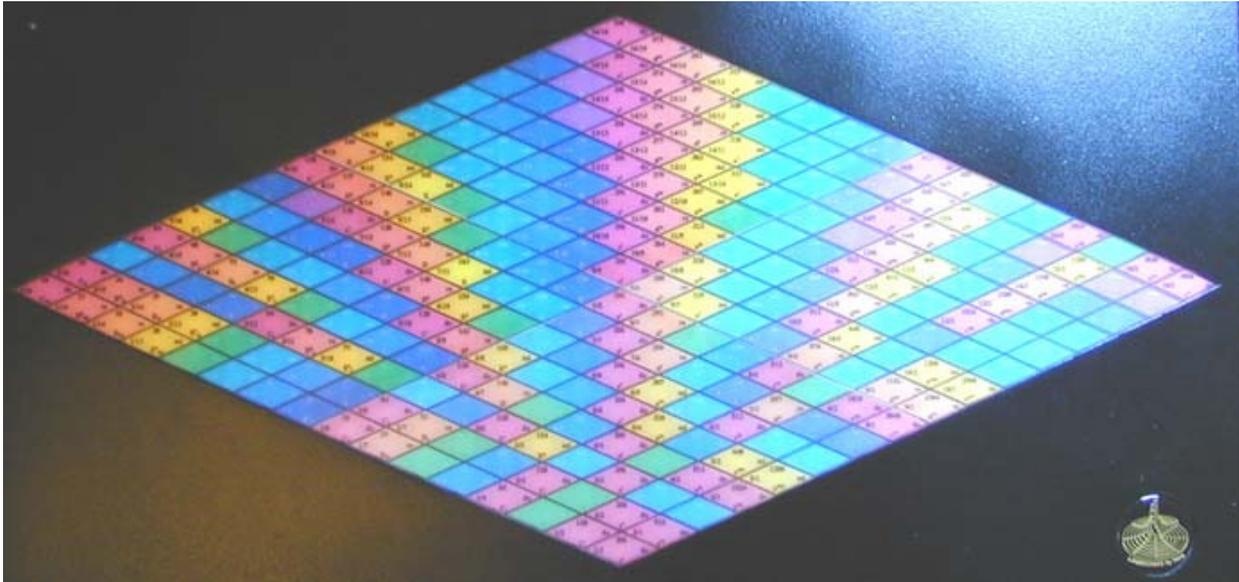


New Musical Instrument May Reveal Key to the Universe

by Dan Shaw



Since the beginning of time, philosophers have sought the key to unlock the mysteries of the universe. Some modern-day researchers believe they have found the key, and that key is a musical key. Every sound that we hear results from movement. Every thing in existence, even every molecule vibrates. While not every vibration can be heard by the human ear, every vibration can be measured. Vibration, or frequency, is measured in cycles per second (cps), also called Hertz (Hz). For example, consider a violin string, tuned to the musical note "A" in our familiar Western musical scale. The string vibrates 440 times per second. Shorten the string slightly, and it will vibrate faster, and at 466 times per second, you will hear the higher note, "B flat". This basic musical theory may be familiar to musicians in the West, but there are many other musical scales used around the world. The "C, D, E, F, G, A, B, C", or "do, re, mi, fa, so, la, si, do" scale known as the "equal-tempered" or *solfeggio* scale that we use today was invented by Bach in the 1600's for the convenience of symphony orchestras. This somewhat arbitrary musical system recognizes some half-notes, called flats and sharps, which are played with the black keys on a piano keyboard. But there are an infinite number of intermediate sounds ("in the cracks between the piano keys"), sometimes called "micro-tones". You don't have to be an expert in music or mathematics to recognize that the *solfeggio* system limits the possibilities for music, which actually has infinite possibilities.

Would you like to hear all the harmonic microtones, instead of just some of the harmonic tones? You would need a new musical instrument. That new musical instrument has already been invented by mathematician Barbara Hero. It is a synthesizer called the Harmonic Keyboard. The keyboard works with a computer, so that you can easily program in, and hear, any sound frequency as a key note. That key note is called the fundamental. The Harmonic Keyboard is shaped like a diamond-

shaped checker board. Anyone -- even non-musicians -- can play the Harmonic Keyboard, because every key is in tune with every other key. If the key note of is 440 cycles per second is programmed in, then the row of keys to the upper right increase by doubling (octaves) to 880, 1760, etc. And the row of keys to the upper left decrease by halving, 220, 110, etc. (See the illustration.) The theory, of course, is more complex but that is the basic idea. The other keys play whole-number ratios, such as 3:2 (1320:880) (a "harmonic"). And 2:3 (880:1320) (a "subharmonic"). Each key produces two different notes simultaneously, one through each stereo speaker.

While the theory isn't easy to explain in words, it becomes instantly understandable when one plays or listens to the entrancing sounds coming from the keyboard, which Barbara calls the Pythagorean Lambdoma Harmonic Keyboard (PLHK). Mathematicians may want to learn more about the theory, which is based on Pythagoras' numeric table (known as the Lambdoma Pythagorean Chi X, or Tetractys). The Lambdoma gets its name because the numeric table was originally shaped something like the Greek capital letter *lambda* [λ].

Scientists agree that everything has a vibratory frequency, but why do we assert that the Pythagorean Lambdoma Harmonic Keyboard holds the key to unlock the mysteries of the universe? First, we can measure the frequency of colors, chemical elements, organs of the body, and anything else, even planets, stars and galaxies. Then we can "translate" these frequencies to sounds that we can hear. Using the PLHK we can play, and play with, these sounds. Hearing these "new" sounds can be profoundly healing. Many people report that these sounds induce expanded states of consciousness. Barbara's PLHK's computer program also shows the beautiful sacred geometric shapes that correspond with the relationships, or ratios, between pairs of notes and even chords.

When our minds and bodies are out of harmony with our environment, illness may result. Perhaps hearing the full range of possible sounds creates harmony with our environment, and healing or wholeness. Barbara Hero's decades of research into the mathematics of sound has resulted in a Renaissance of music, and new, yet ancient musical scales, and a revolutionary musical instrument. A wealth of information about music and healing can be found at her website, **www.lambdoma.com**. Barbara's research has relied on the vital contributions of many researchers, and her work will be carried forward by other scientists in many disciplines. The Pythagorean Lambdoma Harmonic Keyboard will prove to be a landmark in unlocking the mysteries of our musical universe. As we approach the gateway to the infinite mysteries of the universe, we will find that the door is already open.

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