

## Acoustics of Shankha and Shofar

By M.G. Prasad and Robert Harari

Stevens Institute of Technology

### ABSTRACT

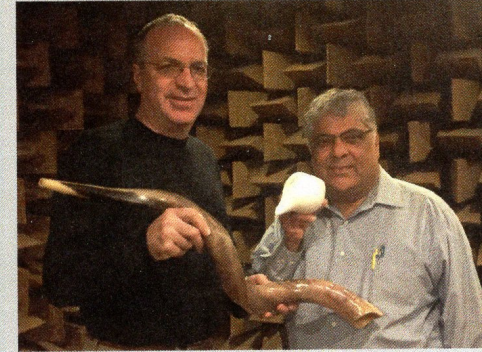
Historically, a call to arms has been announced with a loud sound, a sound wave that would propagate for large distances in the open air, to call warriors to their duty. This need transcended geographic locations and cultures. Before electronic communication was available, organic instruments were used. These instruments held such power and energy because of physical properties; and because of the high tonal quality, they also induced a psychoacoustic effect on the listeners. Their sound also lent itself to a religious context of being able to move large groups of people in emotional synchronicity.

The Shankha, otherwise known as a Conch Shell (*Turbinella Pyrum*), and the Shofar, otherwise known as a Ram's or Elk's horn, have similar spiral structures, which are Fibonacci in nature. Through the acoustical analysis of the Shankha, from India used in Hindu & Buddhist practices, and the Shofar from the Middle East, used in the Jewish faith, we will see how distinct geographic separation, one near the sea, the other near the desert and differing religions, found the same humanistic function from their respective horn.

### BIOGRAPHY

Dr. M.G. Prasad is a professor in the Department of Mechanical Engineering with specialization in the areas of Acoustics, Vibration and Noise Control. He has more than 100 publications, has presented several invited lectures at national and international conferences and has served as UNDP expert in Noise Control for projects in Romania and India. In addition to his research in noise control engineering, he has extensively published on the topic of acoustics in Vedic literature. He was an invited speaker at the International Symposium on Sound Perception in Worship Spaces in Paris, France in November 2015. Prof. Prasad was the recipient of 2015 Outstanding Educator Award for Excellence in the Teaching of Noise Control Engineering. He is a Fellow of four professional societies namely the American Society of Mechanical Engineers, the Acoustical Society of America, the Acoustical Society of India and the Institute of Noise Control Engineering (USA).

Rob Harari has versatility in the field of audio and music with alternating roles as a composer, music producer, audio engineer, musician, sound designer and educator. Over a 30-year career in music, Harari has been fortunate enough to work in the studio and tour with major artists on Emmy and Grammy awarded projects. Recently, Harari has added Researcher working both in medical environments and developing innovations in performance technologies for live events. Taking the decades of experience creating and mixing sound in a variety of venues, and combining that with an appreciation of how the audience reacts to the aural environment of those events, has led to the exploration of how sound inherently causes physiological reactions in our bodies, known as psychoacoustics. Harari believes that if we can map the brain while analyzing specific aural signals, we can open the door to understanding how to live better through innovative design specifically focused on acoustic profile of our environment.



### EVENT DETAILS

#### DATE:

Wednesday, March 16

#### TIME:

1:00-2:00 pm

#### LOCATION:

Morton 324  
Stevens Institute of Technology

#### ATTENDANCE:

Free and open to the public