# Reviews: Choral Sound Within Reach!

*Prof. Harald Jers, Conductor, Germany*

**The two CD productions presented here share a strong focus on special recording techniques with unique audio features, enabling a home listening experience that rivals a live concert acoustic. In both cases, high quality headphones are recommended in order to fully appreciate the sound. The listening experience differs from a 5.1 surround configuration based on binaural room synthesis with a multi-channel sound system, which requires an appropriately sophisticated speaker setup.**

## CD: “Lost Voices of Hagia Sophia”


Hagia Sophia – “Holy Wisdom” – was built 532-537 AD by Emperor Justinian and is considered the most important building of all time. Musical performances were central to the liturgy until the Ottoman conquest of Constantinople in 1453, from which point it was used as a mosque. From 1935 to 2020 Hagia Sophia was a museum, and all music, whether instrumental or vocal, was forbidden. With the rededication as a mosque in 2020 that situation has not changed.

Fortunately, in 2010 scientists at Stanford University were able to record Hagia Sophia’s essential acoustic impression,

which was then made available to science for research purposes, and to the listener of this CD. The acoustics of the room at different time periods were simulated and reproduced very realistically with the help of stereo acoustic reflections. According to the theory of linear, time-invariant systems, under certain conditions all sound characteristics can be contained in the acoustic reflections. Once recorded, every direct signal from source to listener can then be processed to sound as it would in the desired acoustical space.

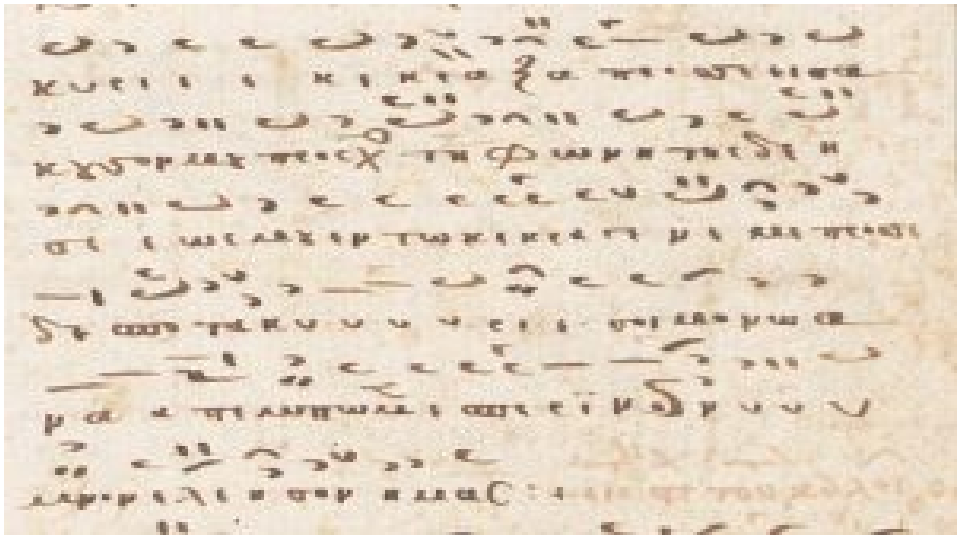
In May 2010, the bursting of a balloon in Hagia Sophia at a height of approximately 3 metres served as the acoustic template for the room. The sound was recorded with two omnidirectional microphones, which were attached to a researcher’s head, above the ears. Based on this sound profile, room acoustics were generated that could be incorporated into subsequent recordings. After initial recordings by Cappella Romana under the direction of Byzantine music specialist Professor Alexander Lingas, two concerts were held in 2013 and 2016 in Bing Hall at Stanford University. The oval concert hall with a capacity of 842 has terraced rows of seats, and more than sufficient space for the 13-member vocal ensemble on the stage area. Each member of the ensemble was equipped with a microphone near his or her mouth. The singers’ direct sound was mixed via the connected recording studio with the Hagia Sophia acoustics, and reproduced on 24 loudspeakers.

capella romana © CCRMA Stanford University

The compilation of concerts and rehearsals on this CD represents a sound experience that has been hidden for 500 years, and offers an impression of how the room may have sounded in the sixth century. Notwithstanding changes in the space (removal of Christian insignia, interior fittings, decorations and bells, which were covered in plaster in 1453) and in personnel (ca. 500 people would have attended services) the acoustics of Hagia Sophia are captured in a form that is closer to the original than the great early Christian basilicas of Rome and Jerusalem.

The CD’s repertoire includes various medieval, Byzantine chants for the feast of the Exaltation of the Holy Cross in Constantinople. As a specialist in this music, Professor Alexander Lingas has reconstructed numerous manuscripts for practical performance and directs this specialist ensemble. The excellently trained singers manage to give life as well as a sense of space to the interplay between long tones of the fundamental and fifth and the euphony of the melody. The

interaction of space and music with the slow tempi allows the singers to adjust their harmonies to the resonance of Hagia Sophia. The drone sounds fill the room like an organ, and the voices resounding above float on this “bed of sound.” Barring any external noise, a 12-second reverberation is audible.

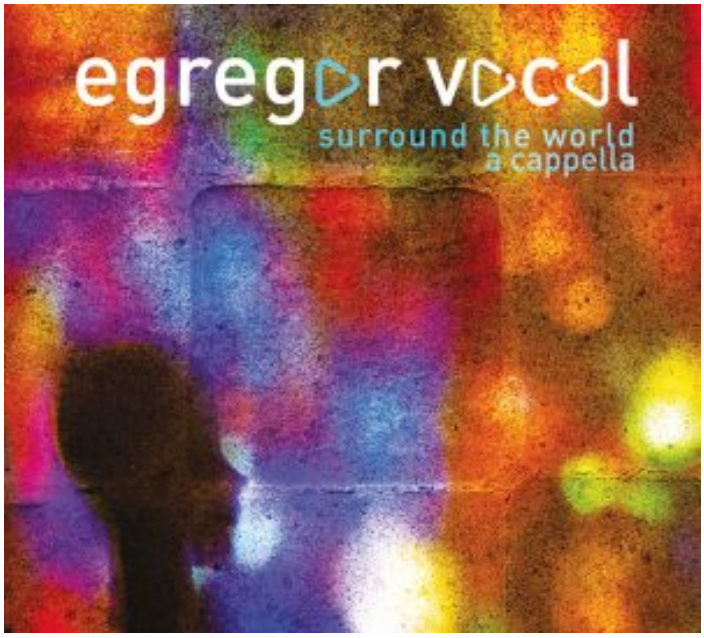


*First verse of the Kekgragarion (Ps. 140) “Lord I have called to you, hear me. Give heed to the voice of my supplication when I call upon you” and its refrain “It is only to you, O Lord and Master, that we send up our evening hymn: have mercy on us.” From MS Athens 2062, f 54r, reprinted with permission.*

Since 1991, this American vocal ensemble has appeared in concerts as well as on numerous CD recordings. Its director is a professor at the University of London and a specialist in Byzantine music history. While the majority of the liturgical actions on and around the ambo take place near the center of Hagia Sophia, some of the roles such as deacon and priest are sung in locations between the ambo and apse. These voices sound more diffuse due to the distance and unique acoustics of these spaces.

For a contemporary listener, the repertoire may seem a bit monotonous and harmonically static. As mentioned in the booklet, and explained in a documentary on the enclosed Blu-ray disc, the listener in invited to engage with the music in terms of images, meditation and atmosphere. Seen this way, the architecture, the technology and the arrangements contribute to create a unified listening experience. In melismatic passages the choir brings focus to the intelligibility of the text, an appropriate nod to the fact that some chants were used to accompany the liturgy.

## CD: "Surround the World A Cappella"




The CD "Surround the world a cappella" by the vocal ensemble *egregor vocal* also focuses on surround sound recording. The concept represents the number 16 in different contexts: 16 vocal works, 16 different countries, 16 acoustical room configurations and 16 different vocal complements: solos, duos, trios, etc. up to the full complement of 16 voices. In contrast to the recording technology of "Lost voices of Hagia Sophia," in which room acoustics were reconstructed and overlayed, the technicians on this CD made surround sound recordings with a unique configuration for each work, e.g. individual voices from different positions, antiphonal duets, romantic sound from a distance, antiphonal double choir, and individual voices separated from the larger ensemble.

Dummy head recording, (also known as artificial head

recording) has been used in scientific and musical applications for many decades. This technique mimics the head or torso of the human form, with two microphones located at the center of two artificial ears. This special stereo recording technology thus reproduces not only delay and varying sound levels, but also the spectral equalisation that is necessary for spatially localised perception in the brain. For a realistic spatial effect, headphones or a special loudspeaker arrangement are necessary.

The 16 international, professional artists of the innovative ensemble *egregor vocal* have made an excellent name for themselves under their artistic director Thomas Roullon through their experimental approaches in concerts and recordings. This CD presents works spanning stylistic and national boundaries, from renaissance and folk song arrangements, to romantic and contemporary choral works, to jazz arrangements.

egregor vocal © Pauline David

Saint-Jacques de Pouzauges church (France) and the interior and exterior of the nearby priory of Grammont were chosen as the recording locations. Rooms located there (kitchen, refectory, cellar, guest room, hallway and stairwell) offer extensive positioning options for the dummy head recording equipment, the locations of which are carefully shown in the booklet. In a further detail, the ensemble opts for the pitch of an A=432 Hz, which Verdi had also advocated. Since, as Nikola Tesla noted, the number 432 is divisible by 3, 6 and 9, this “tuning fork of the earth” and the corresponding pitch is thought to have special resonance with stone, wood, and natural materials. For some listeners with perfect pitch this tuning can take some getting used to, but overall this lowered pitch gives the recordings a certain relaxation.

Thomas Roullon
© Aino Karvo

Two tracks are notable as special experiments. First, the jazz arrangement of “Les Moulins De Mon Cœur,” which is available in an 8D recording. 8D does not mean 8 dimensions, but refers to an audio signal that seems to come from 8 directions; a YouTube trend in recording technology that has grown ever stronger since 2018. Through electronic processing the six separately recorded voices fill the sonic space, and expand the surround sound concept of the CD. The second notable track is the recording of the 12-part Liberté from the cycle “Figure

humaine” by Francis Poulenc. In the multi-track recording, the two sextets are sonically separated. As the tempo of the music increases, the perceived acoustic is enlarged. Another special feature is that the multi-track recording also enables pitch processing. Here, Kirnberger tuning, a variant of the well-tempered modes of the 18th century, is chosen, which gives this recording a special uniqueness.

Across all works, the professional voices complement each other without losing their individual tonal character. Clear and lithe sopranos, sonorous and flexible bass voices, radiant and well matched tenors, and warm and melodious alto voices make up the ensemble. Some female voices tend towards a harder edge, and male voices are particularly incisive. Vocal challenges are resolved artfully, yielding extremely high quality intonation and dynamic balance. Overall, slow, romantically oriented tempos are avoided, which gives the recording a pleasant liveliness and freshness.

## Conclusion

All in all, these are two worthwhile recordings that offer a new kind of listening experience. It should be mentioned that the unique spatial acoustics cannot be reproduced on a normal stereo loudspeaker system, and headphones are recommended. Even without the spatial aspect, it is nonetheless possible to enjoy the high quality and innovative performances of these ensembles.

***Harald Jers*** *is Professor of Choral Conducting at the Musikhochschule in Mannheim, Germany. The State Centre for Conducting, which is based there, is among the most comprehensive conducting courses in Europe, offering coursework in choral, symphonic, opera, and wind conducting, jazz and new music. He also works as a freelance conductor and leads conducting courses at international symposia, music festivals and conferences, teaches choral conducting, singing, and acoustics, and serves as a juror for international choir and composition competitions. With a background ranging from music to physics, his research focuses on acoustics and the voice. Harald Jers has taught in Sweden on behalf of the European Union, and received first prize from the Acoustical Society of America for important theoretical and practical research. He has earned numerous prizes at international choir competitions, made CD recordings, led radio productions, and written scholarly publications. Email: harald.jers@gmx.de*

*Translated from German by Joshua Habermann and Matthew Nielsen, USA*