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# Quantum Artistry

To touch the untouchable. That idea is both the inspiration and the aim of a new work of art that was based on research, born in Santa Barbara and debuting half a world away.

The immersive media installation, “ETHERIAL – Quantum Form from the Virtual to the Material,” was composed by JoAnn Kuchera-Morin, a professor of media arts and technology and of music at UC Santa Barbara. The work, a collaboration with MAT Ph.D.’s Kon Hyong Kim and Gustavo Rincon, was unveiled during the special exhibition “Lux Aeterna,” during the International Symposium on Electronic Arts (ISEA 2019) at the Asia Culture Center (ACC) in Gwangju, South Korea.

The prestigious annual symposium is presented by ISEA International, a non-profit organization fostering interdisciplinary academic discourse and exchange among culturally diverse organizations and individuals working with art, science and emerging technologies.

The work, which also is being featured in a month-long show at ACC, is among those selected by curators from more than 500 proposals in a competitive review process. Collaborators Kim and Rincon were instrumental in bringing the work from the virtual to the material through a spatial, augmented reality enhanced system and a virtual sculpture that is being fabricated into material form.

“The piece is based on my research of visualizing and sonifying quantum mechanics,” said Kuchera-Morin, part of the MAT graduate program, and

founder/director the campus's AlloSphere Research Facility, a one-of-a-kind, immersive 3-D lab. "In this work we have transformed the quantum mechanics of the hydrogen-like atom's time-dependent Schrodinger equation from the visual and sonic into the material."

The installation, she explained, "connects the virtual reality composition projected onto a viewing screen to a spatial augmented reality floor projection." By interacting with the floor projection, which senses and queues to movement, the audience can control the virtual composition. A "virtual sculpture" projected into a VR headset provides another means of viewing the piece.

The complete composition, Kuchera-Morin said, "brings the quantum form into the material, through virtual reality, spatial augmented reality and material form," making the installation space both a 3-D stereo-visual and immersive audio-spatial environment at the same time.

"The nature and behavior of matter and energy on the atomic or subatomic level, quantum physics, lends to its ethereal nature," she noted of the new work. "ETHERIAL is the quantum revealed — to touch the untouchable, to understand and know what is real but cannot be seen and to experience it; to truly experience immateriality as substance, form and shape that is dynamic, transformative and truly alive."

The "Lux Aeterna" exhibition is meant to explore complex themes that allow open interpretations in culture, science and history. Since its foundation in 1990 as the Inter-Society for the Electronic Arts, an academic society fusing art, science and technology, ISEA has been bringing together individuals and organizations from around the world.

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## About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.