

Michael Rhoades

Lead HCI and Extended Reality Researcher, Audio/Visual Artist - Institute for Digital Intermedia Arts (IDIA Lab), Ball State University

mjrhoades@bsu.edu · mrhoades@perceptionfactory.com · 260.414.0450 · Bloomington, Indiana
quantumcomputationalcreativity.com · perceptionfactory.com

EDUCATION

Ph.D., Interdisciplinary Studies in Visual Arts, Musical Arts, and Computer Science , Virginia Tech	2020
Dissertation: Composing Holochoric Visual Music: Interdisciplinary Matrices (practice-based research).	
B.F.A., Creative Technologies , School of Visual Arts, Virginia Tech	2018
Summa Cum Laude · Honors College · Honors Scholar · Certificate for Excellence in Undergraduate Research.	

RESEARCH PROGRAM

Quantum Computational Creativity (QCC). Founder and Principal Investigator. A research and creative praxis directly transducing quantum hardware execution into audiovisual composition. The program treats the quantum processor as a generative artistic instrument whose interference patterns, entanglement topologies, and hardware signatures become compositional material physically irreproducible by classical computing.

Phase I: Foundational sonification (Quantum Etude_00).

Phase II: Quantum computer music; album Reflections from Hilbert Space (Quantum Inspire Tuna-9).

Phase III: Quantum visual music; Dance of the Qubits (Quantum Inspire Tuna-9); treatise Before the Collapse.

Phase IV: Expansion onto IBM Kingston (156-qubit Heron r2), engaging all 156 qubits; first composition 11 Circuits completed.

Phase V: Photonics (in development).

GRANTS AND AWARDS

IBM Quantum compute award: 180 minutes on IBM Kingston (156-qubit Heron r2, 340K CLOPS), valued at approximately \$18,000, one-year term; supporting QCC Phase IV. 2026

Ball State University / IDIA Lab research award: \$5,000 toward additional IBM Kingston compute time, funded through the Lilly Endowment Artificial Intelligence in Higher Education (AIHE) initiative; supporting QCC Phase IV. 2026

Selected earlier awards: ACC Innovation and Creativity Grant (\$2,000, high-performance rendering cluster); ICAT SEAD Grants (Principal Investigator, installations in the Cube at Virginia Tech); Honors College Enrichment Grant.

PUBLICATIONS

“Quantum Interference as Audio Waveforms.” Computer Music Journal (forthcoming).

“Kinetic Relationships in Visual Music Composition: Interactive Changes Over Time.” Journal SEAMUS, vol. 30, no. 1-2, 2023.

“Exploring the Nexus of Holography and Holophony in Visual Music Composition.” Leonardo Music Journal, vol. 30, 2020.

Composing Holochoric Visual Music: Interdisciplinary Matrices. Doctoral dissertation, Virginia Tech, 2020.

“Hadronized Spectra: The LHC Sonifications.” CEC eContact! 16.3, 2014.

“Azimuth: Algorithmic Score Synthesis Techniques.” Journal SEAMUS, vol. 18, no. 1, 2005.

SELECTED EXHIBITIONS AND PERFORMANCES

Hyperspaces (six compositions) and artist talk, Charles W. Brown Planetarium, Ball State University.	2026
Time-based visual work selected to accompany Peter Gabriel’s “Road to Joy” (5050 project).	2025
Into Crystal Lattices, EM Three concert, Sursa Performance Hall, Ball State University.	2024
Bending Glass Walls, Napoleon Electronic Media Festival, Eastern Illinois University.	2023

7 Antitheses, complete installation, Charles W. Brown Planetarium, Ball State University.	2023
Inside the Crimson Castle (An Escher Multiverse), full-dome, SAT Festival, Montreal; and NYCEMF, New York.	2022
Bending Glass Walls, NYCEMF (virtual); Inside the Crimson Castle, SEAMUS, University of Virginia; and Montana State University.	2021
a Priori, 8.1 spatial audio installation, Muncie Arts Walk (Mad Jax), Indiana.	2021
Crystal Verse, NYCEMF, New York; A Hot Jupiter, Cube Fest, Virginia Tech; Reflections and Refractions, EMM, Lewis University.	2018
Second Body Awareness and Ice Cube Windows, ICAT Day, Moss Arts Center, Virginia Tech.	2018
Second Body Awareness, International Csound Conference, Uruguay; Apparitions, Festival NEUE MUSIK LÜNEBURG, Germany.	2017

INVITED LECTURES AND PRESENTATIONS (SELECTED)

Guest lecture on Quantum Computational Creativity, MUS 3066, Virginia Tech.	2026
"Recontextualizing Data Visualization Toward Data Realization," CAAV International Conference, Ball State University.	2023
"Kinetic Relationships in Visual Music Composition," IRCAM Forum at NYU (invited, 30 min.), NYU Steinhardt.	2022
"Exploring the Nexus of Holography and Holophony," SEAMUS, University of Virginia; and NSEME, University of Illinois.	2020
"Hadronized Spectra," International Csound Conference, Berklee College of Music; Toronto Electroacoustic Symposium.	2014

TEACHING EXPERIENCE

Primary Instructor of Record , CCIM 220: Introduction to Extended Reality (online, asynchronous; course designed by instructor), College of Communication, Information, and Media, Ball State University.	2024
Guest Lecturer, MUS 3066 Computer Music and Multimedia (Dr. Charles Nichols), Virginia Tech: 2026, 2023, 2021, 2019.	
Guest Lecturer, ART 4514 Visual Music (Prof. Zachary Duer), Virginia Tech, 2020.	
Guest Lecturer, CS-5724 Human-Computer Interaction (Prof. Steve Harrison), Virginia Tech: semiotics and embodied cognition, 2018.	

SERVICE AND ADJUDICATION

Board of Directors, SEAMUS (Society for Electro-Acoustic Music in the United States).	2007-2009
Host, SEAMUS National Conference , Sweetwater Sound, Fort Wayne, Indiana.	2009
Adjudicator, visual music compositions, NYCEMF (2021, 2022, 2023, 2024, 2025); adjudicator, papers, ICMC (2023).	

SELECTED CREATIVE WORKS

Quantum-derived audiovisual composition: 11 Circuits (IBM Kingston); Dance of the Qubits and Reflections from Hilbert Space (Quantum Inspire Tuna-9); Quantum Etude_00 (IBM FEZ backend).
Visual music: Antitheses (2018-2020; seven interrelated compositions, including Inside the Crimson Castle and Bending Glass Walls); Embodied Cognition (2020-2022; four, including Of the Dazzling Darkness); Hyperspaces (2022-2025; six, including Into Crystal Lattices); Crystal Verse; Second Body Awareness (holographic/holophonic); Ice Cube Windows (projection mapping, Moss Arts Center).
Sustained practice: 250+ electroacoustic compositions across 27 CD projects; 400+ oil paintings, including the recent Atmospherics and Unabated series.

TECHNICAL SKILLS

Quantum computing: Qiskit; IBM Quantum (Kingston / Heron r2); Quantum Inspire.

AI / machine learning: sustained human/machine-intelligence collaborative practice (conversational large language models; local model deployment, Qwen 3.6:27b with retrieval-augmented generation); conversational and character AI (IBM Watson, Amazon Polly, ConvAI, InWorld); affective computing (Twinword); generative image systems (Stable Diffusion); machine vision and body tracking (Intel RealSense, Nuitrack).

Audio and composition: Csound, Cmask, Max, Sonar/Cakewalk, Reaper, Sound Forge.

Visual and interactive: Blender, Maya, Unity (C#), Processing, Arduino, Adobe Creative Suite, projection mapping.

Other: extensive web development, including creation of a sophisticated database search engine; high-performance and cluster computing.