Waveform.ai Performers:
Michael Campagna, MELO, Connor Martin, Rahul Pamadi

Waveform.ai Visual Artists:
Gretta Anderson, Russell Burns, MELO, Finnur Oddsson Cricco

Waveform.ai Engineering and Development:
Michael Campagna, Connor Martin, Alan Gonzalez Osorio, Rahul Pamadi, Colin Tang

The Art & Science Exchange is sponsored by the Office of the Provost.

WAVEFORM.AI

A multi-day event featuring workshops, a concert, and an interactive installation
March 24th & 25th, 2025

MELO (Melody Chua)
Featured Guest Artist

Ran Yang
Executive Producer and Tech Lead

Benjamin D. Whiting
Composer and Artistic Director

Interactive Media Design: Meaning-making in Human-Machine Interaction
March 24th at 11:00 am and 1:00 pm, MAC 062

AI and Hardware Synthesis
March 25th at 11:00 am and 1:00 pm, outside of PBK Studio Theatre

Waveform.ai Premiere
March 25th at 5:30 pm, PBK Studio Theatre

EXPLORE MORE
https://waveformai.wm.edu/

Phi Beta Kappa Hall & Music Arts Center, William & Mary

EVENTS

March 24th
11:00 am and 1:00 pm

Interactive Media Design
Meaning-making in Human-Machine Interaction
MELO (Melody Chua)
Music Arts Center, Room 062

This workshop takes a multifaceted look into interactive media design in both performance and installation settings, examining how choices in scenography, audiovisual design, and human-machine interaction can dramatically alter the resulting expression of a work. Through a reflection of practical experiences from MELO's portfolio, this workshop confronts the questions, "How can a work go beyond technical complexity/novelty and translate meaning to an audience? How can using interactive media be a chance to subvert traditional human-machine hierarchies?"

March 25th
11:00 am and 1:00 pm

AI and Hardware Synthesis
Phi Beta Kappa Hall, outside of the Studio Theatre

An engaging exploration into the technical and musical construction of an AI-powered analog/digital synthesizer. Connor Martin, Rahul Pamadi, Michael Campagna, and Finnur Oddsson-Cricco will guide the audience through a breakdown of the digital, analog, and AI elements of the waveform.ai project. Join them as they dive into the behind-the-scenes of the construction, exciting explorations of AI and synth music, origami lessons, and access to exclusive merch.

5:30 pm

Waveform.ai
Performance at Phi Beta Kappa Hall, Studio Theater
Exhibit at Music Arts Center, 1st Floor Hallway

OUR TEAM

Connor Martin is a senior Engineering Physics (EPAD) major with a Music minor. He has a strong background in performing arts, including extensive experience in theater and public speaking. As a musician, he enjoys piano, although his primary instrument is the pipe organ. Connor has a particular love for vintage and analog electronics. He joined *Waveform.ai* as part of his capstone Honors project to combine his musical experience and knowledge with his engineering expertise to create natural and aesthetic music production interfaces for beginners.

Alan Gonzalez Osorio is a Mexican American studying Computer Science and Applied Mathematics at William & Mary. He has long been passionate about software development and engineering, driven by the joy of creating solutions that both serve and inspire users. As the backend developer for the *Waveform.ai* website, he designed and implemented the database and server systems that power the platform. He plans on continuing his journey in software engineering after graduation.

Rahul Pamadi is finishing his fourth year at William and Mary studying Engineering Physics. With a background in digital music production and as a concert percussionist, he has been surrounded by music his whole life. His technical experience has been heavily centered around electrical engineering, with experience in analog electronics and radiofrequency design, including waveguides and antennae. His love for both music and engineering has found a home in the analog circuitry design and digital effects processing of the *Waveform.ai* project.

Jizhou (Colin) Tang is a Senior studying Computer Science and Arts and is passionate about Software Development, Product Design, and Photography.

OUR TEAM

Gretta Anderson is a freshmen intended Physics and Chinese double major. With a background in visual art and mission design, Gretta has previous experience with the Virginia Space Grant Consortium as a scholar and intern. Gretta is passionate in her pursuit of physics and creative collaboration.

Russel Burns is a graduating senior studying Engineering Physics. His technical experience includes optimization algorithms and plasma physics, but he has been interested in the visual and musical arts since childhood. The intersection of these areas led him to *Waveform.ai*, where he curated the visuals and hardware necessary for the performance. After graduation, Russell will most likely be pursuing his Astronautical Engineering PhD at the University of Southern California.

Michael Campagna is an undergraduate student studying Math and Physics. As an amateur cellist and musician, Michael was originally drawn to these subjects through an interest in music theory, composition, and production. Michael remains enamored with how the domains of mathematics and music conspire to create each other.

Finnur Oddsson Cricco is a sophomore physics student concentrating in Engineering and Applied Design. He combines skills in electric and mechanical design with his passion for folding origami to work as a mechanical and visual designer for the team. He has a half decade's experience playing the guitar and enjoys exploring the intersection of music, design, and engineering in his creative projects.

WAVEFORM.AI ●●

Water flows. It seeks the lowest places yet carves mighty canyons. It yields to every obstacle yet overcomes all in its path. Water is soft and fluid yet unmatched in strength.

At the heart of *Waveform.ai* is a collaboration between human musicians and artificial intelligence. Our custom AI, developed jointly by William & Mary's Music and Physics departments, provides a novel approach to sound design and acts as a sophisticated improvisor, reacting to and making music with the live performers. Musicians playing the bespoke digital synthesizer crafted by our students from the Physics department will have the instrument's tone colors constantly evolving as the AI reacts to aesthetic qualities in the improvised music, as well as stimuli gleaned from the audience in the performance venue. The AI will join improvisors playing acoustic instruments and supply its own musical material to the set. The performance seeks to celebrate the transhumanist potential of welcoming AI onto the stage as a partner instead of merely as a tool.

After the concert performance, the audience flows into the interactive exhibit. Within the installation, the environment becomes part of the music, mirroring the ever-changing nature of water. Sensors and microphones capture audience movements, ambient sounds, and temperature fluctuations, like ripples in a pond. Our system processes these inputs, transforming them into bedazzling visuals and musical elements that integrate with the performance. The venue itself serves as a three-dimensional immersive display, with visuals being projected onto anything and everything within it, complemented by dynamic lighting that responds to the ebb and flow of the music. *Waveform.ai* invites you to a world where every ripple tells a story, and every wave carries a new idea.

MELO (MELODY CHUA)

Considered a "pioneer in the development of interdisciplinary performances with new technologies" (2021 Jahresbericht ZHdK, "Mit der Maschinen lernen") new media artist, MELO (Melody Chua) engages with technology in ways that question not only what one can do with the technologies, but how those interactions unfold: "How can we upend traditional human-machine heirarchies? What narratives arise from these interactions? How can we subvert a system while being entangled within the system? What structures can be found in the apparent chaos?"

Awarded a Fulbright-Swiss Government Excellence grant for the development of a sensor-augmented flute (Chaosflöte), MELO has formed a unique audiovisual performance practice with both the Chaosflöte and her self-developed improvisation machine (AIYA). The aesthetics of her work gravitate towards immersive future-fictions, introspective reflection, nuanced storyscapes, and intimate worlds.
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MELO's performance works have been selected by prestigious festivals and conferences around the world, including the Zürich Design Biennale (CH), New Interfaces for Music Expression (NIME Conference; CHN), Zentrum für Kunst und Medien Next Generation Festival (DE), Geneva International Film Festival (CH), Swiss Digital Day (CH), Atlantic Festival Future Music Lab (USA), Performing Media Festival (USA), Radius Center for Contemporary Art and Ecology (NL, collaborative installation), among others.

As a conscious educator, Chua has given lectures and workshops on electroacoustic music, improvisation, and interactive music programming at institutions such as the University of Chicago, Zurich University of the Arts, University of the Arts Bern, University of Music and Performing Arts Stuttgart, University of South Florida, among others.

MELO is currently a doctoral candidate at the University of Music and Performing Arts Graz and PhD-in-residence at the Zürich University of the Arts Immersive Arts Space.

RAN YANG

Ran Yang is the Executive Producer and Tech Lead behind Waveform.ai, a project that blends art, technology, and nature into an interactive musical experience. With a solid background in physics and practical experience in technology applications, Dr. Yang unites AI-driven sound processing, sensor-based visuals, and live musical performance into a stage experience that mirrors the persistent and adaptive flow of water.

Her work with MedChai in healthcare technology and her role as a professor at William & Mary shape a clear, grounded approach to creative problem-solving and audience engagement. In *Waveform.ai*, the performance space becomes a dynamic environment where every ripple and flow contributes to a shared narrative between human creativity and machine intelligence.

Dr. Yang sees technology as a force that, like water, finds its way naturally through obstacles, enriching creative expression. By collaborating with a diverse team of musicians, engineers, and artists, she ensures every performance invites audiences to experience technology as a gentle, evolving presence.

Through her leadership, *Waveform.ai* offers a fresh perspective on live performance —one that values collaboration, authenticity, and the natural rhythm of creative expression. Dr. Yang's vision is an open invitation to explore a creative journey that is as fluid and adaptable as water itself.

BENJAMIN D. WHITING

With his music having been described as "marvelously intriguing" and "evocative" in a Fanfare review, composer and improviser Benjamin D. Whiting is perpetually seeking new and exciting ways in which technology can assist composers and performers by augmenting their expressive and creative potential.

Whiting has had performances and given talks on his electroacoustic work at festivals including ICMC, SEAMUS, NYCEMF, N_SEME, EMM, eviMus, EMUFest, TIES, Sonorities Festival of Contemporary Music, USF New-Music Festival, TUTTI, CMS, and MUSLAB. He also continues to compose and experiment in a purely acoustic medium, with his most recent acoustic work being *Cave Paintings of Discourse*, released on pianist Eunmi Ko's album, *12 Views on Life*, in 2024.

In addition to his activity as a composer, Whiting frequently performs as an improviser specializing in electronic and electroacoustic techniques, notably live coding and no-input mixing. He is also seeking new avenues in electronic music expression, exemplified by *Tabby's Star*, a hybrid interactive fiction and electroacoustic music experience that premiered as an installation work in Tampa, FL, in 2024.

Whiting received his A.Mus.D. from the University of Illinois at Urbana-Champaign. Recordings of his music can be found on the ABLAZE Records, University of Illinois Experimental Music Studios, Navona Records, Music From SEAMUS, Odd Pop, and Neuma Records labels. He currently serves on the faculty of the College of William & Mary's Department of Music as Assistant Teaching Professor of Electronic Music and resides in Williamsburg, VA.