

La La Lab

the Mathematics of Music

Concept

Conceived in collaboration with world renowned experts, *La La Lab - the Mathematics of Music* will mix a laboratory format with interactive exhibits to present visitors with the historical, conceptual, and philosophical connections between mathematics and music: from the centuries-old tools that musicians use for composing, to the most current research that pushes the boundaries of musical creativity and mathematical knowledge.

Exhibition

La La Lab - the Mathematics of Music brings the visitor to an interactive exploration and discovery of music from a mathematical perspective. The exhibition pivots over three axis:

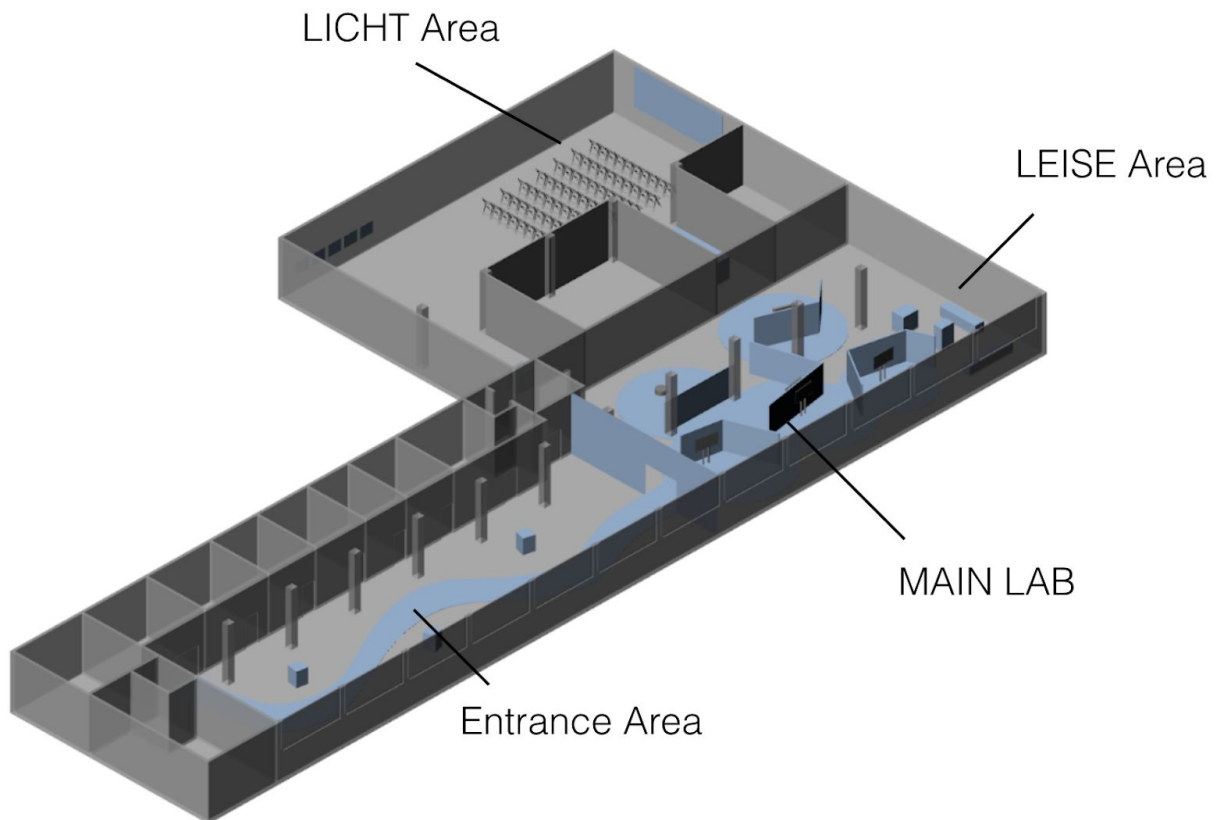
- Music theory - Learning what tools build music, and how these tools are used to create art. Basic concepts and historical comments.
- Current research - The latest trends of research in the connection of maths and music. Artificial Intelligence, theoretical and new instruments, classification and composition tools.
- Art and entertainment - A joyful display of artworks from artists and mathematicians in the field. Talks/concerts at scheduled events.



Motivation

Music and Mathematics share many similarities as fields of study. Both disciplines are abstract, have structures and manipulation rules, a well defined notation, and are absolutely precise in their results. Working on them requires practice and an analytical mind. It is no surprise that Mathematics and Music are closely related.

La La Lab - Spaces



Visitors entering *La La Lab - the Mathematics of Music* may walk by the Laureates gallery and discover some of the favourite songs of these honoured mathematicians. (*Entrance hall*)

A playful area with exhibits explaining different core topics of maths & music will await visitors when entering the main exhibition area. Visitors will be invited to explore exhibits following their personal interests and needs. (*Main lab*)

Time to relax or to deepen the research? Visitors will find a comfortable space in the back of the main exhibition area with sitting opportunities. A bookshelf with curated research books will serve those who are ready to dive deeper. (*LEISE area*)

When entering the second hall, visitors will be attracted by the film station. They might want to sit down to watch some of the movies chosen for *La La Lab - the Mathematics of Music* to broaden the sensoric experience of visitors. (*LICHT area*)

Exhibits

Covered topics will be f.ex¹ .:

- The Fingerprint of Sound / Tones and Waves
- The Tonkreisel / Modes of the diatonic scale
- The Tonnetz / Chords and triads
- Composition / the Narrative structure of a song
- Expressiveness / Perception of music & Machine Learning
- NSynth Super / A.I. Synthesizer
- AI Jam / Duett between Human and Machine
- Lissajous / Harmony

Team

Experts panel:

Moreno Andreatta (IRCAM Paris, Univ. Strasbourg), Thomas Noll (ESMUC Barcelona, TU Berlin), Jürgen Richter-Gebert (TU Munich), Luisa Pereira and Manuela Donoso (NYU New York)

IMAGINARY team:

Andreas Matt (Director), Kathrin Unterleitner (Management), Daniel Ramos (Content), Bianca Violet (Content, Communication), Christian Stussak (Software), Eric Londaits (Software), Sebastián Uribe (Software), Malte Westphalen (Design), Konrad Renner (Design), Lukas Reck and Daniel Weiss (Production)

Collaborators:

Corentin Guichaoua, Philipp Legner, Ryan Cashman, Gerhard Widmer, Stephan Balke, Florian Henkel, Neil Sloane, Georg Fischer, William Cheswick, Charles Greathouse, Neil Thapen, Vítor Rolla, Pedro Arthur, José Ezequiel Soto Sánchez

¹ The final decision which exhibits will be shown is made after pre-tests with potential visitors in spring 2019.