Brandenburg LABS

Case Study

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Where Sound Becomes Space: Okeanos Pro at HTWK Leipzig

A practical look at spatial audio in teaching, research and applied production

Ilmenau, Germany, June 30, 2026 — Immersive audio is difficult to explain from a fixed listening position. It depends on space, movement, loudspeaker setups, room characteristics and the way listeners perceive changes around them. The Hochschule für Technik, Wirtschaft und Kultur (HTWK) Leipzig uses Okeanos Pro by Brandenburg Labs to make these relationships audible, physical and easier to understand. The HTWK in Leipzig is one of the first customers of Brandenburg Labs' Okeanos system. The system delivers an outstanding immersive listening experience via headphones. For one year, the university has been using the system to introduce students in the audio production program to immersive music production and give them creative freedom. But what are the benefits of using the system in research and teaching?

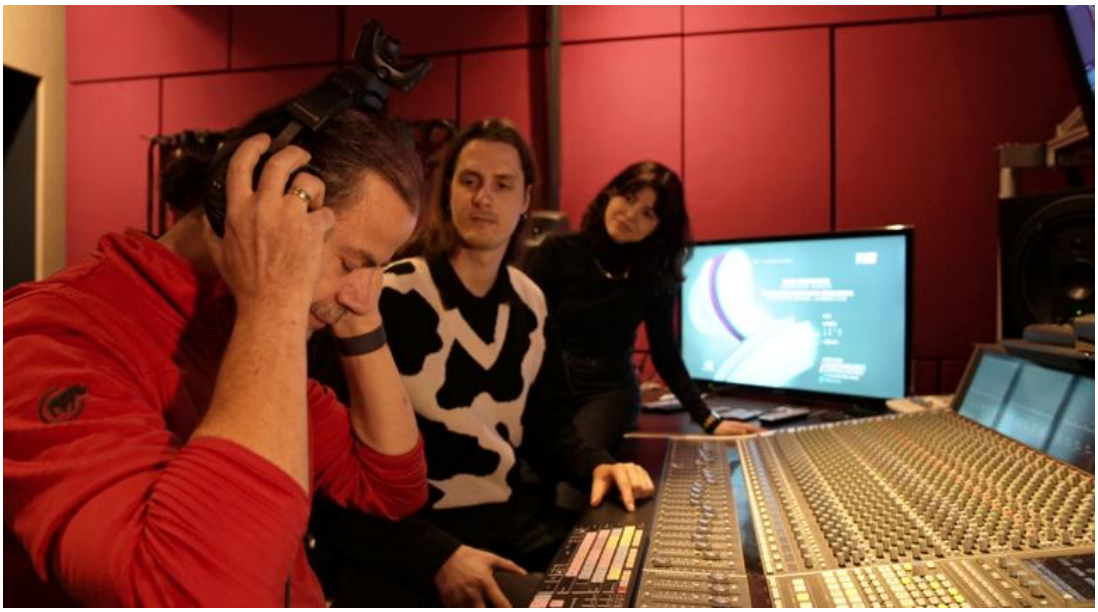
For Christian Birkner, faculty member of Electronic Media Systems Engineering, the advantages of Okeanos Pro are quite clear: It is the only system for immersive binauralization of sound that offers free room calibration and six degrees of freedom, i.e. it reacts dynamically to the exact position and rotation of the user's head. Therefore, the system aligns very well with what Christian Birkner associates with the term "immersive." For him, immersive audio is closely connected to three ideas: quality, creative freedom and a special technical attraction. This perspective shapes how the system is used at HTWK Leipzig.

How students work with Okeanos Pro

Christian Birkner first encountered the technology at trade fairs and professional events. What began as curiosity later developed into a concrete use case at HTWK Leipzig. As part of a research context, the university acquired Okeanos Pro in autumn 2024 and integrated it into audio production education, particularly in one seminar where students record a band and deal with mixing and binauralization. Okeanos Pro's role is not simply to demonstrate a technology, but to help students understand what happens when sound is no longer treated as a flat signal, but as something that exists in relation to space and movement.

One of the central aspects for HTWK Leipzig is the system's support for six degrees of freedom. Users are not limited to turning their head from a fixed position. They can move forward, backward, sideways and through the simulated listening environment. For Birkner, this freedom of movement changes the way users approach spatial audio.

It allows them to connect technical parameters with direct perception and to understand why precise binaural reproduction depends on more than one isolated feature. In teaching, this makes Okeanos Pro especially useful.

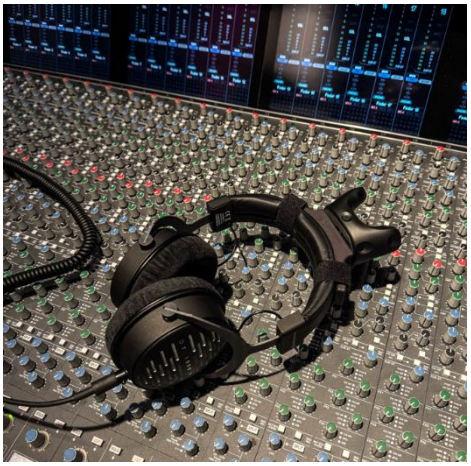


Christian Birkner (left), lecturer and faculty member of Electronic Media Systems Engineering at HTWK Leipzig, uses Okeanos Pro in his audio production seminar to introduce students to the topic of spatial audio in a practical way. ©RainbowEvent

The system brings together several parts of audio practice that are often taught separately: loudspeaker measurement, room acoustics, sound characteristics, head tracking and binauralization. For students, this turns a complex workflow into an experience they can listen to, move through and question.

New possibilities in the creative process

This is particularly valuable because immersive audio is not only a matter of technical reproduction. It also changes the creative process. The listening environment itself becomes part of production. A key learning effect comes from the connection between visual orientation and auditory perception. When users move through a space and the sound field reacts in real time, they begin to understand how position and perspective shape what they hear. The system therefore does not replace theoretical knowledge.



Instead, it gives that knowledge a perceptual reference point. At the same time, Okeanos Pro remains a professional tool that asks users to engage with complexity. Birkner points out, that operating a system and truly understanding it are two different things. How students work with Okeanos Pro depends on their level of experience and on their willingness to explore complex spatial scenarios.

Headphones with a head tracker for 6DoF tracking from the Okeanos system by Brandenburg Labs in the audio studio at HTWK Leipzig. ©Brandenburg Labs

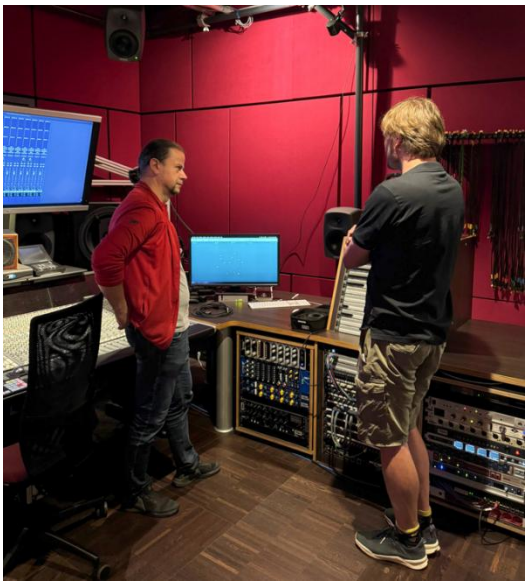
This complexity is part of its educational value, because it shows that immersive audio is created through many technical and creative decisions working together. For other universities and research institutions, this makes Okeanos Pro especially interesting. It offers a way to teach immersive audio without reducing it to either theory or demonstration.

Personally, he finds it particularly exciting that Okeanos Pro not only enables the virtualization of existing spaces but also creates room for experimentation. How far can I take virtualization? To what extent does a listening experience still sound plausible when individual parameters are altered? Such experiments are likely to be of interest to other sectors as well, such as the gaming industry.

Paradigm shift toward "immersive first"

The collaboration between HTWK Leipzig and Brandenburg Labs adds another layer to the use case. From the university's perspective, it is valuable that feedback is heard and that practical needs can influence further development. Ideas and requests from the academic context have already contributed to the product's development path. This creates a dialogue in which the customer is not only a user of the technology, but also part of its ongoing evolution.

Looking ahead, Christian Birkner sees immersive audio as something that should enter the production process much earlier. Instead of treating immersive formats as an additional layer at the end, they should be considered from the beginning. This idea of immersive first-thinking is essential if spatial audio is to develop effectively.



First-hand insights: Christian Birkner (left) and Thomas Thron, research engineer at Brandenburg Labs, discuss possible further developments of the Okeanos system in the studio at HTWK Leipzig.
©Brandenburg Labs

The work at HTWK Leipzig shows what this can look like in practice. Okeanos Pro helps bridge the gap between technology and perception, between teaching and production, between real spaces and simulated auditory environments. For Brandenburg Labs, the experiences of HTWK illustrate one of the core promises of the system: immersive audio becomes most powerful when it is not only explained, but experienced.

To explore the possibility of acquiring Okeanos Pro systems, please visit our website or contact us at sales@brandenburg-labs.com.

About Brandenburg Labs

Founded in 2019 by Prof. Dr.-Ing. Karlheinz Brandenbug, co-inventor of the mp3 format, Brandenburg Labs GmbH develops immersive audio over headphones to create intuitive and realistic listening experiences that can immerse a listener in any soundscape.

When using headphones, creating an immersive audio experience over headphones has posed enormous challenges for both science and industry for decades. The goal at Brandenburg Labs is to place solutions and products on the market that enrich digital life through immersive audio. As a spin-off of the Technische Universität Ilmenau and the Fraunhofer Institute for Digital Media Technology (IDMT), Brandenburg Labs draws on many years of research in the field of audio at these institutions.

With their first-generation immersive audio system, they have proven their superiority and convinced more than 1,000 audio experts at conferences and congresses worldwide. Deep Dive Audio technology enables the recreation of real acoustic environments via headphones or to create new realistic listening environments, allowing virtual sounds to fit seamlessly into the user's life and build a bridge between the real and digital worlds.

With Okeanos Pro, Brandenburg Labs is marketing systems to customers in the field of music production and to scientific institutions. Their groundbreaking Deep Dive Audio technology provides audio engineers with the ability to experience their content as if they were surrounded by physical loudspeakers. Supporting all currently available multi-channel formats and switchable within seconds, the system integrates seamlessly with studio hardware via standard Audio over IP (AoIP) connectivity solutions, such as Dante and Ravenna. The next generation of headphones of the Okeanos series for tech-savvy audio enthusiasts will be available soon. Brandenburg Labs' long-term goal is to market intelligent headphones (PARty).

For more information visit www.brandenburg-labs.com.