



## D5.2 Möbius experiences

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## Revision History

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## Executive Summary

Kunstkraftwerk Leipzig (KKW) was responsible for producing a multimedia immersive show of two books selected by the consortium. These shows were designed to have a duration of 30min in total encompassing a complete audiovisual experience.

It was the objective to provide the two shows three different technological ways:

- (1) a version which can be presented in the Kunstkraftwerk venue with an immersive projection system in a space with 24 projectors, 36x18x10m and 1700m<sup>2</sup> projection surface on four walls and the floor.
- (2) a miniaturized version to be presented in a mobile book Box (MBB), sized 5x5m with two projectors and a 3D-sound system.
- (3) a version which can be played in VR-headsets.

KKW acted as the producer of these shows (responsible Markus Loeffler). It contracted the multimedia expert Franz Fischnaller (Italy) based on the positive experience on a previous project. KKW later also contracted Rupert Huber (Vienna) as sound designer and composer for the soundtrack.

Initially Franz Fischnaller was developing the story board for the novel “Influence of Blue” by Giulio Ravizza. This was completed and accepted in autumn 2022 and encompassed a narration of over 22 min. Then the production started. Until April 2023 11min of the show were available and supported by sound. This preliminary version was shown to the public and the Möbius Consortium on the occasion of the Leipzig Book Fair reading event in April 2023. The response of the public and of the consortium was positive and encouraging.

From April to August 2023, we have intensively worked on reaching the deadline of the delivery. The production of Influence of Blue was carried forward to generate a long 22min version and a 4min short version.

In addition, the second fiction short story named “Fantasy into Möbius” was designed. A story board was consented in Mai 2023 and a layout for an 8min immersive show was generated.

By the end of August 2023, the final productions of the two immersive shows were received from the contracted artists. Both artists were present on August 28/29 and the two shows “Influence of Blue” (22 min) and of “Fantasy into Möbius” (8min) were handed over and tested. The productions were run on the large venue Maschinenhalle in Kunstkraftwerk Leipzig. All technical and artistic quality requirements were fulfilled.

The two show versions were also run in the Mobile Immersive Box system and worked well.

VR-headset versions of the shows were also made available in long and short versions. They have been used in the meantime in different book fairs.

**Hence all goals and deliverables on WP 5.2 were reaching in time by end of August 2023.**

With the assistance of EURCAT the MBB audio system was made 3D sound compatible. The MBB was already used several times in October 2023 (Bright Festival Leipzig, Frankfurt Book Fair) and demonstrated its useability.

At present social media formats for a downloadable VR-version are being prepared and will be provided as soon as an exploitability agreement between KKW and the publishing house is consented (presently in progress).



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## Terminology and Acronyms

<i>BFC</i>	<i>Bright Festival Connect</i>
<i>CG</i>	<i>Computer Generated</i>
<i>EC</i>	<i>European Commission</i>
<i>EU</i>	<i>European Union</i>
<i>FP</i>	<i>Framework Programme</i>
<i>KKW</i>	<i>Kunstkraftwerk Leipzig GmbH</i>
<i>MBB</i>	<i>Möbius Book Box</i>
<i>MIB</i>	<i>Möbius Immersive Box = MBB</i>
<i>PMB</i>	<i>Project Management Board</i>
<i>PMP</i>	<i>Project Management Plan</i>
<i>VR</i>	<i>Virtual Reality</i>
<i>STAB</i>	<i>Scientific and Technical Advisory Board</i>
<i>WP</i>	<i>Work Package</i>



# 1. Introduction

Kunstkraftwerk Leipzig (KKW) was invited to the Möbius consortium project due to its rich experience in producing and showing multimedia immersive shows. Started in 2016 as a SME KKW has already gained a large reputation by a rich program of immersive shows ranging from art history (renaissance, Hundertwasser, Van Gogh, Werner Tübke, Gustav Klimt), to history (Industrial history of Leipzig), music (Bach Goldberg variations, Mussorgsky - Pictures of an Exhibition) and literature (Italo Calvino, Alice in Wonderland). In addition, KKW has a rich network of immersive artist studios. KKW considers itself as one of the leading institutions of immersive art productions in Europe.

Immersive installations have become popular in the past years. Our experience is that this technology permits to offer a new approach to art and culture to many persons in particular to a young audience. The stories can be told in a less didactic but more in an emotional way. This provides a low-level access. We have measured the effect recently. In the Klimt exhibition in summer 2023 we have had 65.000 visitors of whom about 20% had no higher school qualification and the age spectrum of 12 to over 80 has been noticed.

We have also had some limited experience with making immersions on book stories. We were happy to be invited to produce an immersive installation on science fiction/fantasy literature. The approach would be experimental. Agreeing with the grant application we committed ourselves to a production of two stories (with a total of 30 mins) in three different formats:

- (1) Large scale immersions (to be presented in the KKW venue)
- (2) a smaller sized mobile installation (Mobile Book Box, MBB)
- (3) a VR – headset version

The selection of the two shows has been done by the consortium and WP 5.1. It resulted in a novel by Giulio Ravizza and a short fantasy story called Fantasy into Möbius by Filippo Rubulotta.

The production of the shows started in August 2022 (M19) and was completed by August 2023 (M30). Since then the results has been used by the consortium.

## 2. The three Möbius Experiences

### 2.1 Immersive shows

In the following we describe the creation of the show mainly by the example of “The influence of Blue”. This process was similar for the other show, “Fantasy into Möbius”.

#### a) Story Board creation:

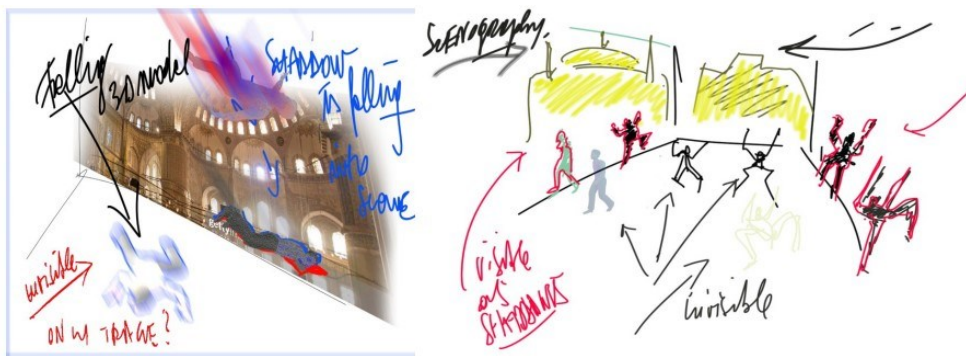
Initially we put a lot of effort into developing a story board to represent the story of the novel. The novel is 230 pages long. It first had to be translated to English. Then we summarized the scenes. It became clear that the narration sequences had a reverse order which could not be used well for an immersive linear story telling. We therefore rearranged the scenes and prioritized them. This was done in interaction with Franz Fischnaller and Markus Loeffler.

Franz Fischnaller then proposed a story board with 15 scenes, which provided a logical framework.

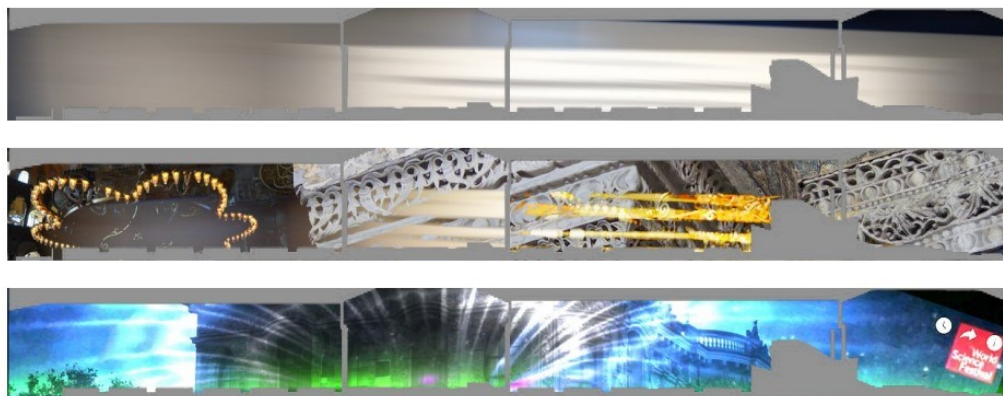
Once this was consented the artist started to work on the visual concept. He started with drawings of sceneries and of designing the viewpoints of the projections and perceptions. This implied to develop a spatial imagination of how the scends would be perceived in the KKW-venue, given the 3D-structure. The further development implied that one floor and four walls had to be described.

Scene 1	Scene 2	Scene 3	Scene 4	Scene 5	Scene 6	Scene 7	Scene 8	Scene 9	Scene 10	Scene 11	Scene 12	Scene 13	Scene 14	Scene 15
00:00 — 00:45	00:45 — 01:40	01:40 — 03:38	03:38 — 05:23	05:23 — 06:23	06:23 — 07:08	07:08 — 08:31	08:31 — 09:29	09:29 — 12:12	12:12 — 14:47	14:47 — 17:02	17:02 — 17:54	17:54 — 19:15	19:15 — 20:54	20:54 — 22:00
Entry	Dis- topia	Picasso exhibit Rodolfo suicide	Paris Laborat ories	Monre ale	Wall	Mobius into Istanbu l	Book Flip	Night mare in KUCUK SU Palace	Diving into the Bos- phorus	Puzzle and desper ation	Cavo and Leone's letter	Bike to Blue Mosque	Suicide Jump	End

**Fig.1:** Summary of the 15 scenes "The influence of Blue". Interpretation for the Immersive digital art show experience.



**Fig. 2:** Sketches of panoramic division of the immersive images for the walls of KKW-Maschinenhalle.



**Fig. 3:** Sketches of Panoramic division of the immersive images on the walls of KKW-Maschinenhalle.

## **b.) Visual concept and image integration**

Fischnaller then designed the scenes individually with integrating photographic material from various sources (e.g. pictures from the historic sites of Rome, Istanbul, Paris, pictures of Picasso, videos about diving scenes) and also generated images.

This was a very labour intensive step with taking each minute of visual generations several days. Then there was an improvement and rearrangement step.

## **c.) Mapping and Masking of the 3D Space**

The Maschinenhalle in the Kunstkraftwerk is an old factory space. This hall is characterized by columns integrated in the walls which need to be masked in order to avoid visual distortions. To support this task KKW has provided a high resolution scan of the spaces of walls and columns to enable a precise mapping. This masking had to be adjusted and depended also on the precise positioning of the projectors.

During this process Franz Fischnaller had several workstations in use permitting him to see the images in his design system.

## **d.) Editing and Rendering**

When the sequence of the show was clear Fischnaller started the rendering process. This process generated a film from a large stack of high resolution pictures (about 30 pictures per second). This makes the visual video effect. This rendering has to be done for each wall. It is a very intensive process on the computer which typically last many days.

These video versions can be run on computers and from them screen shots are generated.

When the shows are presented in the hall, the audience is allowed to take pictures.



**Fig. 4:** Snapshot of the rendering process.



Setup for the 4 walls following the indications of the Anchor/reference points



Masks setup in the Watchout system (only the areas on the mask are visible on the walls!)



Masks setup in the Watchout system with placement of the columns on the wall

**Fig. 5:** The CG films are projected on the 1280 m<sup>2</sup> surface at the walls and floor in the KKW MH facility. The wall projection in the resolution of 18000×2000 pixel and the Floor projection with the resolution of 3840×2016 pixel create a full immersive audio/visual environment.

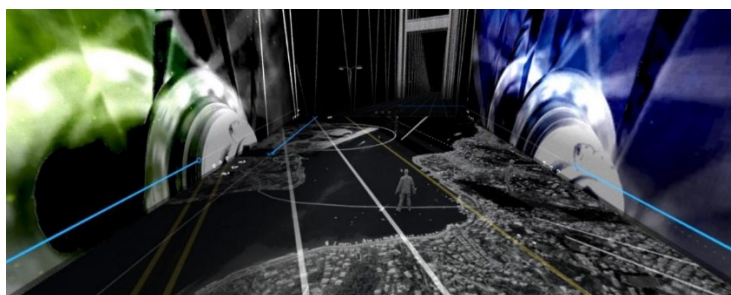


Scene 9 time frame 10\_07\_13



Scene 9 time frame 10\_49\_16

**Fig 6:** The visualization is adapted to the several walls.







**Fig 7:** The visualization is adapted to several walls in 3D animation (snapshot).

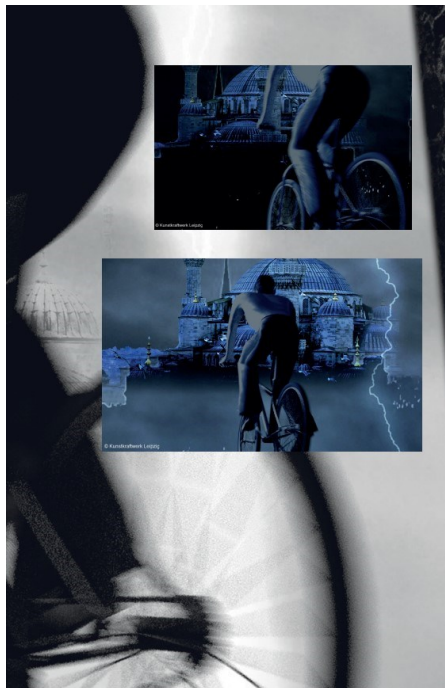
After the final rendering the videos were uploaded to the KKW watchout system from where they could be projected into the large hall. The projections in the MBB could be uploaded to the MBB media server.



**Fig. 8:** Mehmet on the ride to the mosque, filmstill of the first production.



**Fig. 9:** Leones jump, filmstill of the first production.



**Fig. 10:** Digital book “Influence of Blue”, p. 5

«I never saw the inside of the Mosque, but it looks quite high from outside.»  
 «Yes, yes, that is why he dead: all squashed.»  
 Mehmet, satisfied by the explanation, exclaimed: «He slipped!».



«Yes, maybe. But the doctor volunteer of Constantinople said he kind of take a step forward, but no floor is there. He take a step but nothing is there.»  
 «But a step to go where?»  
 «To go down, very quick and falling. He really want to fall on floor.»  
 Mehmet rubbed his eyes. «But he not stumble? I sometimes happens when there are holes in the roads.»  
 «Listen, I not understand well what is happened. Doctor said he jumped, for real, like a jump from a trampoline, when we want to swim. In the sense that he jump forward, but in a ravine.»

**Fig. 11:** Digital book “Influence of Blue”, p. 7

## 2.2 Möbius Book Box

In general, large scale immersive shows are site specifically arranged adapted to the architecture of the particular space. They usually require large projectors systems, computer facilities and sound systems to provide a full immersive experience. This however limits the possibility to bring the shows to other venues at a reasonable price. It is possible if the shows can be adapted by new mapping.

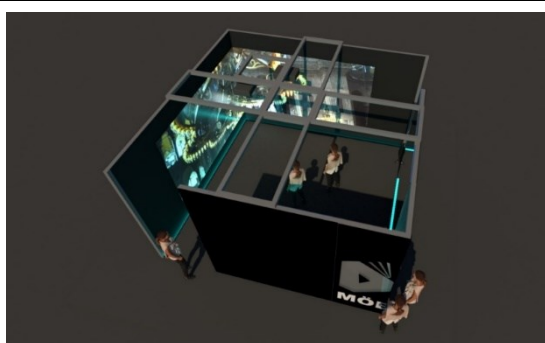
In order to enable a simple transportable technique, the Kunstkraftwerk team has designed the Mobile Book Box (MBB). This has a handable size of 5x5x3m. It needs only two projectors, and an audio system with nine equal sound sources and one subwoofer. These are all connected to one media-server. The producer had the idea for the MBB, Franz Fischnaller created a design with a Möbius logo on the edge. Kunstkraftwerk then did the technical planning with a professional trade fair construction system, a selection of projectors, sound system and a media-server. After some experiments it was found out that the box would merit by constructing it 4m high rather than 3 m in order to obtain better projections with less shadows. In addition, it was found out that in some situations a dark cover over the box would be necessary to create a dark space and optimize projections. These optimisations were found out during several set ups in Leipzig (Bright Festival) and on the Frankfurt book fair (see below).

In an interplay with the sound designer Rupert Huber, Timothy Schmele (EURCAT) and the KKW technicians we arranged a 3D-sound system especially for the MBB. It was first tested on the Frankfurt Book Fair and reached good results.

Kunstkraftwerk Leipzig has established a relationship with a professional agency experienced in trade fair booth constructions. They were commissioned to bring the MBB to Frankfurt and are able to transport it also to other places in Europe. They are knowledgeable for constructing the box and making it run. The shows can be controlled via team viewer by our technical team in Leipzig. Hence KKW is able to ship and install a functional MBB everywhere in Europe.



**Fig. 12:** Design MBB.



**Fig. 13, 14:** Design MBB with corner setup and with cut-out logo.



**Fig. 3 and 4** MBB metal framing

**Fig. 15:** MBB Metal framing.



*Fig. 16: First construction in KKW, Kantine 3.*



*Fig. 17: The MBB installed during BFC.*

## 2.3 Virtual Reality (VR)

The third technical layer provided by KKW was the VR-headset technology.

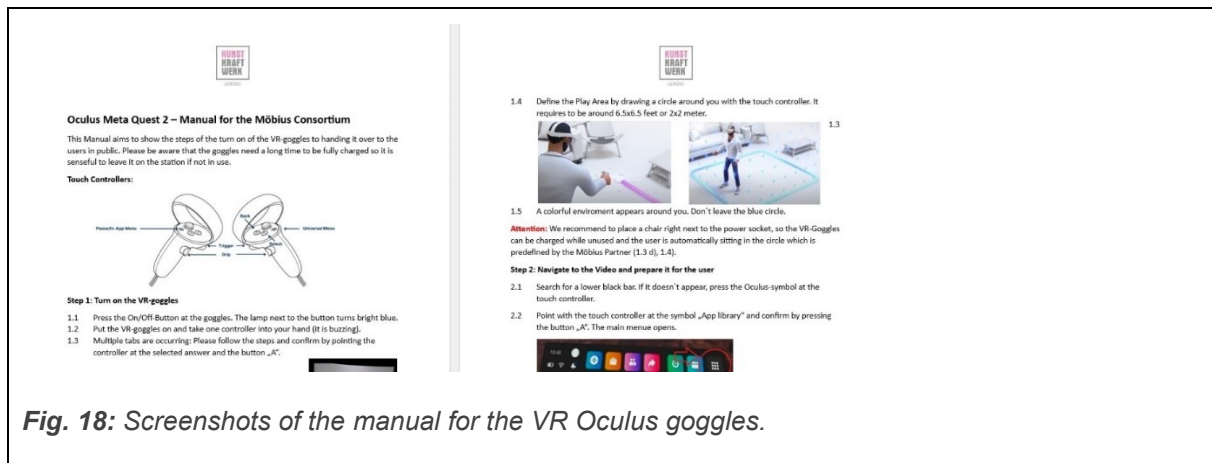
We bought six OCULUS META QUEST 2 systems. We learned how to use them and uploaded the immersive shows on the goggle (long and short versions of “Influence of Blue” and “Fantasy into Möbius”). A manual in German and English was made available for the Möbius consortium so the goggles could be used on many book fairs. They were sent to the places of interest.

When using them in interaction with a broad audience the Möbius team found out that many visitors had problems in handling this technology. In particular it is difficult to explain the navigation of the headset to inexperienced visitors. We therefore decided to provide only preconfigured headsets which are ready to go for only one show and which are prone to start immediately once the headset is taken not requiring any navigation.

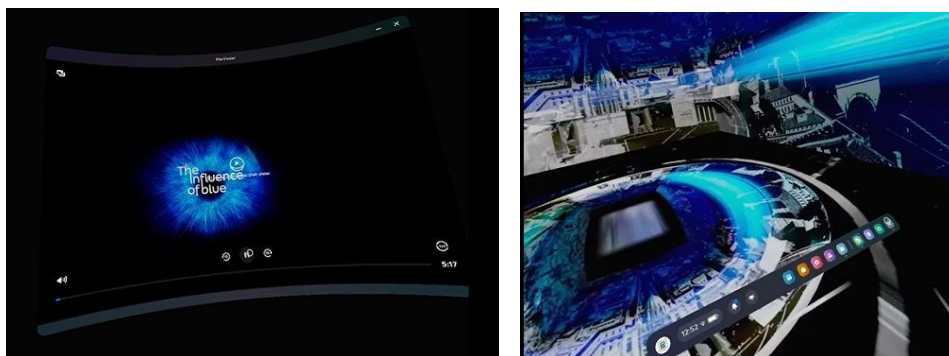


It was also found out that the acceptance of VR-technology is very heterogeneous. Many young visitors can easily handle it while elderly visitors are reluctant.

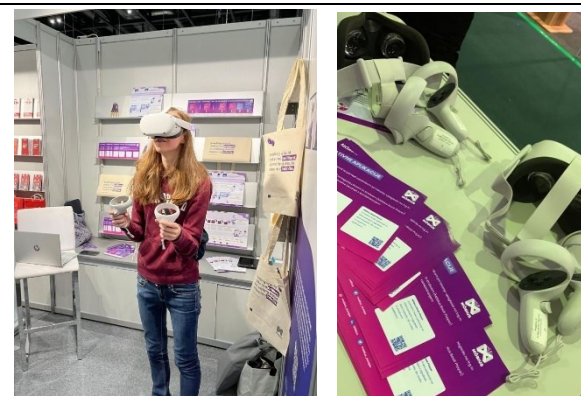
Hence, we conclude that VR is a very good technology to introduce an audience in the capabilities of immersive shows on book stories and other subjects and that it can be very helpful on a promotional setting.



**Fig. 18:** Screenshots of the manual for the VR Oculus goggles.



**Fig. 19:** Screenshots taken while using the VR Oculus goggle.



**Fig. 20:** The goggles were used in several fairs (Vienna book fair "Buch Wien 2023").

## 2.4 Cooperation with the artists and with the WP-leader

Kunstkraftwerk has coordinated the work with the artists Franz Fischnaller and Rupert Huber mostly in video conference which took place every two weeks in average. The first period was dedicated to understanding the manuscripts to be worked on, to design the storyboard, to gather photographic material and reproduction rights from different sources, to provide new 3D-scans of the KKW-halls, to configure the MBB and to select and buy the projectors, sound systems and media-servers. Additionally, the artists were invited to Leipzig for two face to face meetings with the producer in Leipzig.

The first face to face meeting took place April 28<sup>th</sup> and 29<sup>th</sup>. As the immersive show was incomplete by this time (11 min out of projected 30 mins) it was decided how to accomplish the full show by M30 at end of August. On this occasion the story board was approved, the scenes provided up to that time were critically assessed and approved. The soundtrack was also screened and over 60min were available at the time.

The second face to face meeting took place on August 28<sup>th</sup> and 29<sup>th</sup> in Leipzig again. On this occasion the video of the entire immersive installation was handed over. It had 22min of “Influence of Blue” and 8min of “Fantasy into Möbius”. The quality of the videos with soundtrack were very pleasing. In addition, a 4min short version of “Influence of Blue” was handed over for the MBB and for the VR-headsets. Minor corrections were provided in due course. The files were uploaded to the Kunstkraftwerk projection system and worked very well.

Hence the milestone was fulfilled, and the deliverables were accomplished.

During then entire process of WP 5.2 production KKW had a continuous informational exchange with the WP5 work package leader Book a Book during the regular video conferences and plenary meetings.

## 3. Events and Evaluation

### 3.1 Plenary Meeting in Leipzig and Leipzig Book Fair

On the occasion of Leipzig Book fair, we have conducted three different activities.

First, we have hosted a Möbius plenary meeting in Leipzig on April 27<sup>th</sup> and 28<sup>th</sup>. The venue was at the Institute for Medical Informatics, Statistics and Epidemiology (director: Markus Löffler) in the centre of the city. Here we had an exchange of the project progress and of the activities going on. The consortium was present.

Second, we had a Möbius booth at the Leipzig Book Fair from April 27<sup>th</sup> to 30<sup>th</sup>. This was a 8qm stand situated in a very privileged site next to the booth of the Phantastic Author Network (PAN e.V.). On this occasion we also had a 30min presentation of the consortium in a speaker’s arena “Leseinsel 1”. This was well attended and questions from the audience were handled.

On the Book Fair we were also able to connect to several author collectives. The PAN e.V. network was very interested. It is a network of 400 writers of science fiction and fantasy stories.



**Fig. 21:** Möbius Consortium at dinner on the occasion of the plenary meeting in Leipzig.



**Fig. 22:** Franz Fischnaller and Markus Löffler visiting the booth.



**Fig. 23:** Franz Fischnaller, Markus Löffler and Emanuela Furiosi at the speaker's arena.



Thirdly, Kunstkraftwerk has arranged a large event called the “Fantastic Adventure Night” on April 28<sup>th</sup>. Within “Leipzig Liest” (Leipzig reads), a public announced program with several hundred reading events spread all over the city, we had a one exceptional night event. We were able to host up to 150-180 out of 200 registered guests. They got an introduction of the Möbius project (Markus Löffler/KKW, Emanuela Furiosi/Bookabook) and a reading of the novel “Influence of Blue”. Therefore, the author Giulio Ravizza was present and read his book which was read parallel in German (Anne Rossburger/KKW). As last We presented the preliminary 11 min version of the multimedia immersive show. In addition, the multimedia artist Franz Fischnaller was explaining his artistic concept, and the musician Rupert Huber gave a piano concert of the melodies which he had composed for “Influence of Blue”. Although this was declared to be incomplete the audience responded very enthusiastically asking for a repetition once the full version including the two books would become available.

On this occasion we were also able to present the Mobile Book Box (MBB) for the first time. We have presented the 11min version of “Influence of Blue” to demonstrate the potential to get the shows on tour.



**Fig. 24:** *Fantastic Adventure Night, 28.03.2023.*



*Fig. 25: “Influence of Blue” presented in the Maschinenhalle.*



*Fig. 26: Rupert Huber gave two short piano concerts with the e-piano.*



*Fig. 27: Giulio Ravizza and Anne Rossburger gave a reading of the chosen chapters.*



*Fig. 28: Markus Loeffler and Emanuela Furiosi gave a short introduction of the Möbius project.*



*Fig. 29: Key visual, Flyer.*



*Fig. 30: The visiting Möbius consortium members in front of the MBB at the Fantastic Adventure Night.*





**Fig. 31:** MIB firstly shown to guests.

## 3.2 Bright Festival Connect

On October 12<sup>th</sup>-15<sup>th</sup> the Kunstkraftwerk hosted the fourth Bright Festival Connect. This is a festival exclusively dedicated to multimedia immersive shows and to light design installations. We had over 3000 visitors on these four days.

We have also shown the firstly finished Möbius immersive experiences (30 min) during a vernissage on Oct 11<sup>th</sup> in the Maschinenhalle. This was attended by over 70 visitors who gave very positive feedback.



**Fig. 32:** Gathering of the guests before the beginning of the show of the Vernissage of the two Möbius Shows, 11.10.2023.

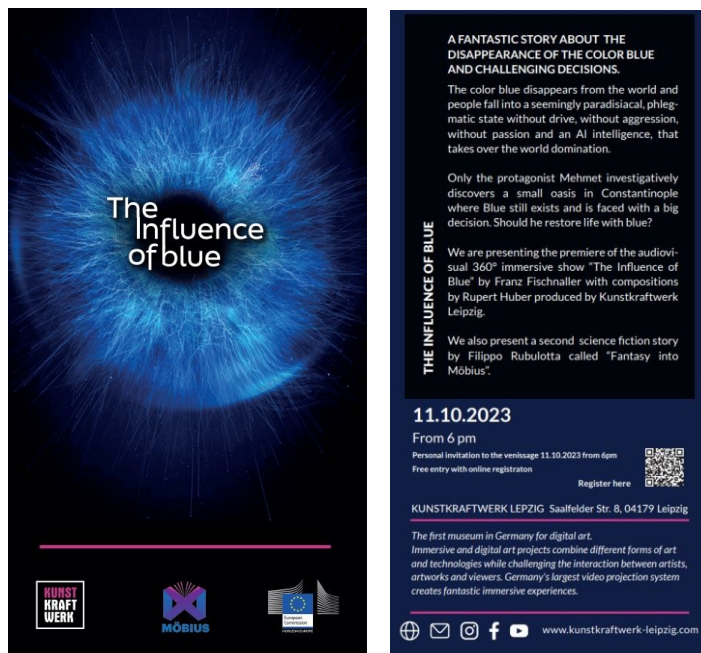


*Fig. 33: Prof. Dr. Markus Loeffler greets the guests and gives an introduction of the Möbius Project.*



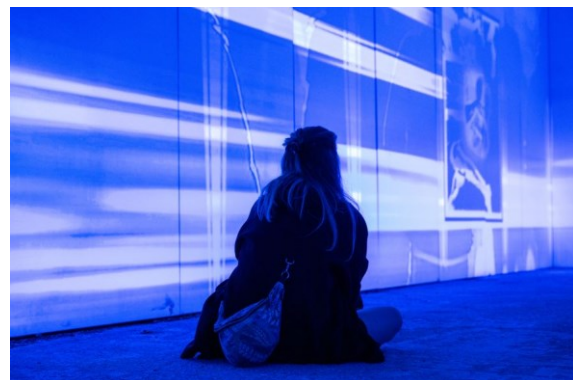
*Fig. 34, 35: The guests enjoy the show "Fantasy into Möbius" at the Bright Festival.*





**Fig. 36:** Key visual and event description with QR-Code.

One day later the Bright Festival Connect (BFC) started and with it the presentation in the MBB. This was included in the parkour in front of the KKW entry. The MBB was fully functional, and the short versions of the shows were presented. A digital survey on an I Pad was installed and placed at the MBB-exit.



**Fig. 37, 38:** BFC guests immersed by the show.



*Fig. 39: The MBB takes most effect during the night.*



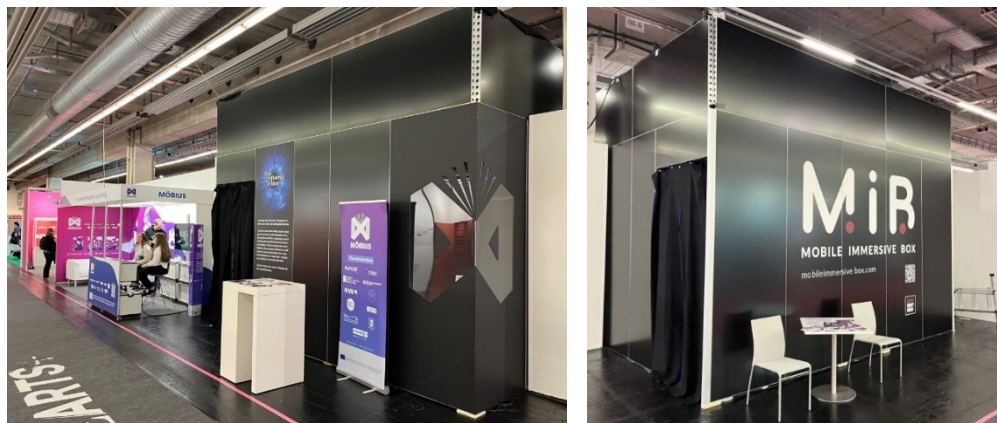
*Fig. 40: The MBB protected by a tent.*

### 3.3 Frankfurt Book Fair

On October 19 – 22, we have supported the Möbius consortium by installing the MBB on the Frankfurt Book fair. After some problems with light pollution from the neighbouring stands the box worked well and visitors could see the short versions of the two immersions.

In addition, we also made the VR-headsets available at the Book Fair with the same content. There were a couple of requests in particular by publishing houses on the MBB. This projection techniques created interest.

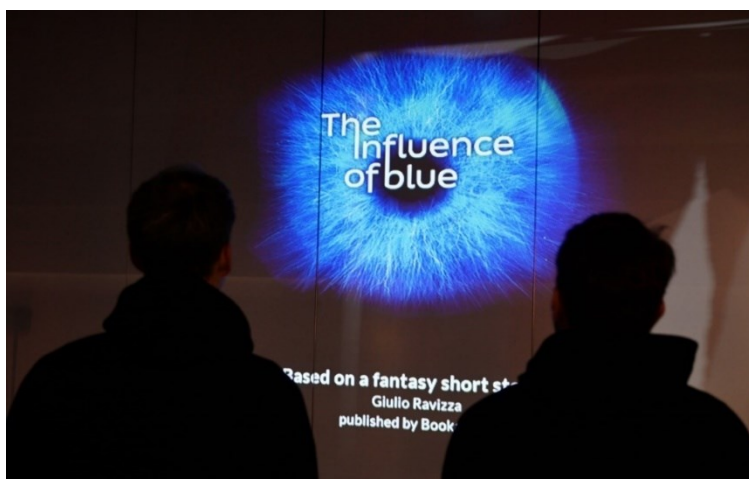
The work of the Möbius consortium was presented also on a stage at the ARTS+ podium.



**Fig. 41:** Presentation of the MIB at the Möbius booth at Frankfurt Book Fair.



**Fig. 42:** Guests enjoy the show “Fantasy into Möbius” at Frankfurt Book Fair.



**Fig. 43:** Guests enjoy the start of the show “The Influence of Blue” at Frankfurt Book Fair.





*Fig. 44: Guests enjoy the show “Fantasy into Möbius” at Frankfurt Book Fair.*



*Fig. 45: Prof. Dr. Markus Loeffler explains the three experiences.*



*Fig. 46: The well attended Aldus Up-Lounge.*



**Fig. 47:** VR-Experience at Frankfurt Book Fair.



**Fig. 48:** Our KKW-Team in Frankfurt Bookfair.

## 4. Conclusions

### 4.1 Main results

The Möbius Book Experience gave us valuable insights into how multimedia immersive installations can be a value for the Book publishing industry and book consumption. We learned that different audiences have different expectations and responses regarding immersive experiences. In brief:

Book Consumers and Readers: Long multimedia immersive productions of books (extending over 30min) generate a very enthusiastic audience response in particular regarding the science fiction and fantasy genre. The visitors like the experience and are attracted and ask for more. We have had very positive responses after such events. However, such productions are cost intensive and may only be cost effective for very well-known books (block buster - like).

Book Publishers: We have had exchanges with book publishers on two book fairs (Leipzig, Frankfurt) and learned that they are interested in using the Mobile Book Box in particular for short promotional immersions (e.g. 1-2min). Some special requests came from children book publishers. In fact, in a different project outside of the Möbius project, KKW has had the experience that children react very well in audiovisual immersive presentations of short durations. For example: we currently have one interacting installation running in a shopping mall which turns out to be highly visited by families. Hence, we anticipate that book publishers can attract a particular audience with these novel digital media if designed well for target audiences.

Book Authors: We have had interactions with author communities, in particular with the Phantastic Author Network (PAN e.V.) They were generally interested in the new mode of presenting books in audiovisual ways. However, it became clear that this technology could only be used in an economically sensible way if a publishing house could be encouraged to promote a story with investment. The authors mentioned the option of sponsoring and/or grant applications.

We have the impression that there are basically two ways for the publishing sector to go forward. One is to apply the digital audiovisual formats for promotional purposes. This would e.g. encompass short audiovisual stories of a few minutes duration which can be shown on screens, VR or small immersive spaces like a MBB. This may be useful on book fairs. It would be recommendable to generate several such shows in a loop by one or several publishing houses together.

Secondly, very popular stories would merit longer productions which could be presentable in large book reading events like the Leipzig Book Fair. This could then be shown in different locations in Europe.

The major outcome for KKW was the possibility to dive into the book publishing world and to experience their requirements. We were able to generate a full new immersive show and found a very positive audience response in the field of fantasy books. We will continue this path and are prepared for further interactions with the book publishing sector.

## 4.2 Outlook

Kunstkraftwerk Leipzig is prepared to carry on the experience made in different ways following the Möbius funding:

- 1.) We are prepared to show the Möbius immersive shows in Leipzig in our venue over the next 3 years regularly. We have the special format of night shows about six to eight times a year. We plan to show literature immersions not only on Möbius books but also on other fantasy stories like Alice in Wonderland (inspired by Lewis Carroll) and Invisible Cities (inspired by Italo Calvino). These night shows usually attract 200-300 visitors.
- 2.) We are planning to repeat the Fantastic Adventure Night of 2023 also in March 2024 in our venue. This will then be a presentation of the 30 min immersive show with a book reading and a concert.
- 3.) We are ready to make the Möbius immersive shows travel to other venues. There is either the option to adapt the full immersive shows to the technical standards of professional immersive venues (e.g. in Milan, Porto, Barcelona, Madrid, Berlin). Also it is possible to send the MBB to other non-professional venues. This would ideally be suited to serve smaller literature reading festivals and book fairs.
- 4.) We imagine that MBB has a potential to be requested in different settings also. We had a request to show some newly designed entertaining immersive videos (partly created with the help of AI) to invite families and children to interact. The experience was very positive, and we expect that this can be brought to a broader audience. We have a strong request by shopping malls for short potentially fiction-based narratives for children.