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## Abstract

With the completely novel hybrid and semi-virtual concert Europasinfonie, ten top European orchestras and a choir will combine their artistic mastery to send a powerful statement of solidarity and union to all Europeans. Furthermore, Europasinfonie will prove that with the proper setup, equipment and software, it is possible to rehearse and perform music even if long distances separate the musicians. And for the first time, it will enable European digital infrastructure to allow for low-latency transmissions by prioritising data routes.

In the concert's overture, conductor Andrea Molino will present the outstanding technology and the participating musicians scattered across the continent. Hereafter, the extraordinary Paneuropean orchestra will perform three new works written primarily for this project. They originate from an international competition in which each participating composer will submit a 10-minute piece. An international jury will select the three winning compositions.

For the concert, all musicians will remain in their respective countries. The sound and video of each participating ensemble will be streamed to a central server and combined into a coherent audio-visual compound. Which then is, in turn, streamed back to the partner orchestra's locations and, of course, to the world. The technological challenge – a transmission ensuring the lowest possible latencies – is responded to by a Network of Excellence consisting of three universities, one laboratory, one research institution and one network provider.

After the concert, the extensive technological and organisational experience will be pooled into a sustainable, long-term networking project for professional musicians. The platform European Musicians Hub (EMH) will enable European orchestras, ensembles and individual musicians to rehearse and give concerts at the highest technical level using Europasinfonie's technology.



## Concrete Measures & Activities

The main activities to achieve a first hybrid concert connecting 11 European countries using technology to reduce latency (to 20 ms) are the composers' competition, the technical implementation, including workshops, training, tests and rehearsals, and the implementation of a communication and PR strategy.

### The Technology Behind the Europasinfonie

The project uses the real-time communication software Soundjack, developed in 2005 by Prof. Alexander Carôt (Anhalt University of Applied Sciences). The technology has been continuously perfected in cooperation with the Dresdner Sinfoniker and others. Today it is one of the leading real-time online rehearsal tools musicians use worldwide.

Soundjack is an R&D low-latency communication system. It works in p2p and server streaming mode. As a result, musical interaction is possible depending on physical distance, network capacities, network conditions, and data routing. The software provides optimal transfer speed using sample rate and audio frame size settings. The same applies to the video signal, which synchronously transmits the image of the conductor to all orchestra locations across Europe. Soundjack's powerful algo-



gorithms generate a compressed data stream and transport a high-quality video image with very low latency. Generally, the higher the sampling rate and the smaller the sample frame size, the shorter the delay. All transmission sites will use the most advanced studio hardware to reduce latency further. State-of-the-art computer peripherals, such as low-latency analogue-to-digital converters, keep runtimes within 20 to 25 milliseconds, which are hardly noticeable by the performing musicians.

Europasinfonie's goal is to create a situation as if musicians were sitting together in the same room. It will use state-of-the-art low-latency signal transmission, which for the requirements are far more complex than those used in peer-to-peer communication (p2p). Hence a central server is needed. The ten European locations will connect to the German concert stage in server streaming mode. An AWS cloud server in central Europe in Frankfurt am Main, Germany, links all participants. The musicians' ability to hear the mix of the entire European orchestra through their headphones is fundamental to the live feel. It allows them to position themselves within the overall sound. Only a cloud server whose processing power is scalable at any time can accomplish this complex task. The most critical data routes reach the AWS cloud server in Frankfurt, guaranteeing the best transfer rates to fibre-optic networks from Estonia to Spain.

Europasinfonie aims to reduce latencies using technology and produce, rehearse and implement new symphonic works that tackle the technical challenges with their composition. Furthermore, all participating entities, such as network operators, research institutes, researchers, partners and institutions, will work closely together to bridge some 14.000 km and bring audio and video to the central concert venue in Germany.

### **From High-End Concerts to European Musicians Hub**

Europasinfonie is a blueprint for future concert formats and forms of joint music-making. With ultra-fast connections and newly developed software and hardware, the infrastructure created with this project will become a platform for musicians to collaborate, rehearse, and perform in real-time: the European Musicians Hub. The platform will form an orchestral network for classical musicians that meets extreme requirements. The technical goal is to create a platform that is as barrier-free as possible, combining maximum usability with excellent performance. Anyone can access and use the results in the user-friendly environment of an online platform. As a result, Europasinfonie will provide all professional orchestras, choirs, ensembles, and individual musicians with extremely high quality, prioritised transmissions, including personal support for the best possible result. Here musicians will find connections to colleagues, composers, producers and their audiences. The growing platform will enrich the concert business and change how music is experienced. New concert formats, including digital elements and musicians' broadcasts alongside the experience in front of a stage, will open new and young audiences to contemporary music and allow for unexpected European encounters. The European Musicians Hub will be inclusive by offering participation to musicians with limited ability to travel because of disabilities or those living in remote areas. Finally, this concept saves resources and is therefore sustainable. Musical encounters across Europe will become the norm – without air travel.



## Composers' Competition

The Artistic Directors of the participating ensembles form the jury. Each member plans and implements the contest and PR and communication activities in their country. An announcement and call for entries to the competition will be made in late 2023. The competition's call will be open and published widely in Europe and abroad, and it will conform to EU standards concerning transparency, equal treatment, conflict of interest and confidentiality. The call will be for three new works with a maximum duration of 10 minutes each. The jury is looking for a personal examination of the European idea, Europe's intellectual history, artists and visionaries. The participating composers know the technical challenges and must conceptualise their music accordingly. The jury will select three winning compositions of equal merit from all the submissions. The procedure is secret and multi-stage (pre-selection, longlist, shortlist, resubmission). The jury meeting will take place in May 2024 in Berlin. The chosen composers will receive a prizemoney of 10.000 EUR each to complete their respective compositions until December 2024.

## Venues

The main event will take place in Dresden or Chemnitz, Germany. Additionally, all participating partners can host a local event and benefit directly and immediately from the cooperation.

Austria: Salzburg

Belgium: Brussels

Estonia: Tallinn

Great Britain: Birmingham

Greece: Athens

Hungary: Pecs

Italy: Milan

Poland: Warsaw

Serbia: Belgrade

Spain: Madrid

Europasinfonie will be available for live streaming everywhere globally, and international media partnerships are planned. Furthermore, through media outreach and the subsequently established European Musicians Hub, all European countries will be able to access and benefit from the results of this project.

## Goals and Impact - What does Europasinfonie want to achieve?

The main goal of the Dresdner Sinfoniker is to realise an ambitious networking project. The performance of the Europasinfonie marks the end of this process, a milestone of many years of development and experimentation, sending an unmistakable signal to the European public. However, its results regarding the technical possibilities of low-latency transmission will have a lasting impact on the artistic world across the continent.

More specifically, the project has the following objectives:

1. Transnational artistic cooperation: as a pilot project, Europasinfonie raises fundamental questions about artistic collaboration, focusing on the production of cultural content in 21st-century Europe. More than ever, the cohesion of liberal democracies depends on transnational creative exchange. Therefore, Europasinfonie and the resultant European Musicians Hub platform promote cooperation between musicians and European artistic and social discourse.



2. Creation of a network of European orchestras/choirs: together with 11 participating ensembles, Europasinfonie will actively explore how European networks should be structured to realise art on an innovative, visionary, and equal footing.
3. Strengthening the European identity: the project aims to draw attention to Europe's cultural wealth and its artists' immense potential. It shows that collaborative networks and projects are the cornerstones of European cohesion.
4. Trial of a new hybrid concert format: the concerts will test the potential of hybrid performance and presentation formats.
5. The composers' competition: some of the explicit aims of Europasinfonie are to combine artistic creation and technological innovation and promote young composers. To this end, an international competition will take place.
6. European Musicians Hub: with this community platform for professional ensembles and musicians, the Dresdner Sinfoniker want to connect artists throughout Europe and reinforce the idea of Europasinfonie.
7. Audience development: The innovative format opens contemporary music to a younger crowd which is tech-savvy and curious about technological development. This format also shows a sustainable and resource-efficient alternative for musical encounters, which appeals to a conscious, more youthful generation.
8. Communication & PR campaign: The project planning provides for a multi-year PR campaign and communicational work coordinated with all participating countries.
9. Ecological sustainability: Europasinfonie relies on transnational collaboration with minimal travel for everyone involved, starting with the project team, which almost exclusively meets and confers online.

## **Milestones & Timeline**

From setting up European collaborations in the technological and artistic fields to the promotion and realisation of the concert to the sustainable use of the results in the European Musicians Hub, the project follows a strategic timetable agreed upon by the partners.

Please refer to the next page for all details.



# Milestones and Timeline

## Preliminary strategic phase

Creation of a network of European orchestras. In addition, leading German and European research institutions for real-time communication systems form a technology alliance.

2022

## Planning phase and project launch

The partner consortium consolidates, and task forces on different aspects of the project pick up their work. Eventually, the composers' competition is announced. During technical rehearsals, sound and video are broadcast from more and more.

2023

**June 6th:** Technical test with six partners  
**September:** EU funding application results published  
**October 17th:** Technical test with nine partners  
**Oct – Nov:** Planning of the composers' competition  
**December:** Open call for composers' competition

## Technical implementation & composition of the musical oeuvres

During two technical tests, partners work towards solving the technical challenges. All partners draft their communication strategy and prepare media partnerships. A test set-up of the stage and its stage technology, incl. the Pepper's Ghost screen, ensues.

2024

**March:** Technical test with up to twelve partners  
**March 30th:** Submission deadline composers' competition  
**May:** Jury meeting composers' competition – announcement of the winners  
**May:** Trial set-up stage setting & video transmission  
**June:** Technical test with all partners  
**Jul – Sep:** Evaluation of tests, publishing of a technology whitepaper  
**October:** Technical test, including video transmission  
**December:** Finalization of the new compositions

## Artistic implementation

Final tests and a rehearsal run conclude the technical groundwork. Next, preparations for the concert take place, and the orchestras' public relations activities trigger audiences across Europe. Finally, the EMH platform launches to the public following the concert.

2025

**March:** Technical test concert situation  
**May:** Technical test concert situation  
**July:** Final test run technology  
**Oct or Nov:** Press conference  
**November:** Final rehearsal phase  
**Potentially November 7th, 8th, 14th or 16th (tbc)**  
Concert and live broadcasts worldwide  
**December:** Project accounting & closing, publication of project documentation



## Artistic Partners of Europasinfonie

### **Dresdner Sinfoniker, Dresden, Germany**

With their visionary ideas and multimedia, interdisciplinary projects, the Dresdner Sinfoniker stand for cosmopolitanism and tolerance and see themselves as mediators between different traditions and cultures. They know what civil courage and free thinking can achieve: Most orchestra members experienced German reunification first-hand. The Dresdner Sinfoniker place themselves between all fronts and across all borders, both stylistically and politically. Musician Markus Rindt is the artistic director and creative head of the Dresdner Sinfoniker. In 1997 he founded the orchestra together with musician and composer Sven Helbig. As the project's initiator, the Dresdner Sinfoniker will contribute about 70 string players.

### **Athens State Orchestra, Athens, Greece – Clarinets**

The oldest Greek symphony orchestra, the Athens State Orchestra, has existed under various names since the end of the 19th century, only recently celebrating its 75th anniversary in its current incarnation. With more than 50 concerts a year at home and abroad, the orchestra represents Greece's cultural heritage and orchestral tradition up to the present day while also performing masterpieces from the world repertoire. Since October 2020, the Athens State Orchestra has been under the artistic direction of Loukas Karytinou.

### **Birmingham Contemporary Music Group, Birmingham, UK – Piano/celesta and harp**

The Birmingham Contemporary Music Group (England) was founded by Simon Clugston and Ulrich Heinen, musicians from the City of Birmingham Symphony Orchestra, in 1987, with Sir Simon Rattle as the Founding Patron. BCMG believe that music can bring people of all ages and backgrounds together. So they built an inclusive community of composers, musicians, and audiences, enabling them to share their spark of imagination, creating beautiful and strange sounds. They embrace change, question the ordinary, and celebrate brave choices. The ensemble has commissioned over 175 pieces of music from the world's finest composers and emerging international talent.

### **Brussels Philharmonic, Brussels, Belgium – Percussions**

Founded in 1935, the Brussels Philharmonic was and is known to be a pioneer in performing contemporary music and exploring new technologies for the 21st century. The orchestra also specialises internationally in performing and recording soundtracks for films, series, and games. Based in the Flagey building in Brussels, the heart of Europe, the Brussels Philharmonic is directed by Kazushi Ono.

### **Estonian National Symphony Orchestra, Tallinn, Estonia – Tubas & trombones**

The Estonian National Symphony Orchestra (ERSO) – is the leading symphony orchestra in Estonia. Founded in 1926 as the Radio Orchestra of the Estonian State Radio, it acquired its present name in 1975 under its principal conductor, Neeme Järvi. The orchestra is based in the Estonia Concert Hall in Tallinn and performs regularly in many European countries. In addition, it has released numerous CD recordings, even earning a Grammy Award. Since 2020, Olari Elts has been the ERSO's chief conductor and artistic director.

### **No Borders Orchestra, Belgrade, Serbia – Trumpets**

The renowned NBO is a symphony orchestra comprised of excellent musicians from the Western Balkans. It grew out of the desire to create a regional cross-border symphony orchestra. The NBO project rests on two main foundations: music and society. It's goal is to initiate positive social de-





velopment through the power of reconciliation and creative collaboration. In November 2016, the NBO cooperated with the Dresdner Sinfoniker on the commemorative concert of the Armenian Genocide “aghet-ağit”, which both orchestras jointly performed in Belgrade.

#### **Orchestra Sinfonica di Milano, Milan, Italy – Flutes**

Founded in 1993 by Vladimir Delman, the Orchestra Sinfonica di Milano gained considerable recognition with an extensive symphonic repertoire under the direction of Riccardo Chailly. In 2009, Zhang Xian became the first woman in Italy to assume the position of principal conductor. Over its 30-year career, the orchestra has worked with renowned guest conductors and soloists, including Carlo Maria Giulini, Riccardo Muti, Martha Argerich and Yefim Bronfman. Today, the orchestra cultivates major classical works and is increasingly dedicated to contemporary repertoire.

#### **Orquesta Sinfónica de Madrid, Madrid, Spain – Bassoons**

Founded in February 1904, the Orquesta Sinfonica de Madrid was shaped in the following decades by Enrique Fernández Arbós, not only in artistic terms. He also ensured considerable structural innovations and invited famous conductors such as Richard Strauss and Igor Stravinsky to Madrid for guest conducting engagements. In the early 1980s, the OSM became the regular orchestra of the Teatro de la Zarzuela and devoted itself increasingly to operas, ballets and traditional Spanish zarzuelas. Since 1997, the orchestra has been permanently resident at the Teatro Real in Madrid and continues to enjoy great renown with its opera productions, numerous symphony concerts and chamber music cycles.

#### **Pannon Philharmonic, Pecs, Hungary – French Horns**

Initially founded by Austrian conductor Lickl György, the Pannon Philharmonic celebrated its 200<sup>th</sup> anniversary in 2011 and is now one of the leading orchestras in Hungary. Since this anniversary, the orchestra has resided in the newly-built Kodály Center in Pécs, which boasts first-class acoustics. Led by conductor Tibor Bogányi, its wide-ranging programs reach audiences of all ages. The orchestra focuses on inviting young audiences by creating innovative projects. In addition, every year, the Pannon Philharmonic performs at renowned festivals accompanied by great artists from the international music scene.

#### **Sinfonia Varsovia, Warsaw, Poland – Oboes**

The Sinfonia Varsovia Orchestra was created at the initiative of Sir Yehudi Menuhin, who, for a 1984 concert program, added some outstanding young wind soloists to the Polish Chamber Orchestra. The ensemble's success resulted in numerous international tours and collaborations with important conductors and soloists. Its constant presence on the world's most famous concert stages and the consistently positive reviews by renowned critics testify to the orchestra's exceptional quality.

#### **Mozarteum, Salzburg, Austria – Choir**

The chamber choir of the University of Mozarteum Salzburg was founded in 2007 to perform the most beautiful acapella works in small ensembles at the highest possible artistic level. Since then, the chamber choir has regularly staged concerts in the Mozarteum's Solitarium, where it has also performed repeatedly as part of the famous “KlangReisen” cycle since 2012. In addition, concert tours have taken the highly regarded ensemble of young singers to Spain and Slovenia.



## Scientific–technological Partners of Europasinfonie

European universities, research institutes, telecom companies and leading sound & video studios are involved in the technical implementation. They form the **Europasinfonie Network of Excellence**.

### Hochschule Anhalt, Köthen, Germany

Anhalt University of Applied Sciences is a knowledge forge with a strong practical orientation. The straightforward concept of the Anhalt University of Applied Sciences aims to bring together science and innovation consistently.

Role: Research Partner and technical implementation

### University of Liechtenstein, Vaduz, Liechtenstein

Research and teaching in Computer Science deal with the design, implementation and use of information systems and their role in innovation and transformation in companies and society. The Department of Information Systems and Computer Science also is a partner in the ERASMUS+ project: “Online Choirs: How to carry out virtual choir rehearsals with the help of digital tools”, launched in October 2022.

Role: Liechtenstein is cooperating in eliciting requirements for the platform, creating a user manual and writing publications about the research findings.

### Fraunhofer–Institute for Telecommunications / Heinrich–Hertz–Institute, Berlin, Germany

As the world’s leading research institute for mobile and optical communication networks and systems, fibre–optic sensor systems and the coding of video signals and image data processing, the Fraunhofer Heinrich Hertz Institute (HHI) provides knowledge in the abovementioned fields.

Role: HHI contributes expertise in immersive media, video processing, compression and transmission.

### Open Lab Berlin, Berlin, Germany

Berlin Open Lab is an experimental space for transdisciplinary research projects at the intersection of technology, society and arts.

Role: Open Lab Berlin provides premises and space for testing the technical structure.

### Technical University Berlin, Berlin, Germany

TU Berlin provides scientific exchange and support in technical matters, especially in audio communication.

Role: TU Berlin is involved as a scientific exchange partner and consults technical issues with HHI.

### Vodafone, Brussels, Belgium

Vodafone is one of the leading telecommunications companies in Europe. Vodafone focuses on innovations in infrastructure, such as multilayer networks with 4G, 5G, IoT and cable fibre.

Role: For Europasinfonie, the company provides technically ideal equipped locations and optimised network usage to make this unique event happen with the lowest latency possible. Also, the Vodafone Group coordinates with its Vodafone subsidiaries in the partner orchestras’ countries.

### Vodafone Deutschland, Düsseldorf, Germany

Vodafone is one of Germany’s leading network providers.

Role: Vodafone Germany will establish a dedicated server in Düsseldorf specifically for Europasinfonie.

## Cooperation & methodology

All partners jointly prepare and develop general aspects of the project. Work packages, workflows and milestones are planned and defined. Five task forces have been established:

- Composers' Competition
- Communication/PR
- Tech/Platform
- Sponsoring & Fundraising,
- Narrative & Sustainability

The task forces and project teams address and further develop the different aspects of Europasinfonie. The results of each task force are recorded in meeting notes and are transparently available for all participants. Jour fixes, workshops and training sessions involving all project partners ensure smooth collaboration. Therefore, all partners share the responsibility. The partners will also form an international jury to decide which composers will receive the commissions for Europasinfonie.

The project managers will gain all the necessary knowledge for implementation and decision-making in particular workshops and training sessions. Debate culture is the basis for decision-making. Decisions are taken via votes or polling tools, while every vote counts the same.

Within the project, a network of technology partners consisting of technological experts, research institutions, network operators and universities is established and works closely together. This Network of Excellence specifies exact frameworks and the groundwork of the technology applied. They form the basis for the realisation of the concert and the development of the European Musicians Hub.

Europasinfonie will bundle new ideas. In the future, the results will serve the professional collaboration of musicians in various constellations across the continent.

## Public Relations Measures

The Dresdner Sinfoniker and their European partners will use various channels to promote the project to the public and experts. For this purpose, a Europe-wide campaign is being developed for the whole project and executed by the public relations teams of all project partners. In addition, the communication departments of the artistic partners and other partners also are involved.

The following measures are planned:

- Development of a unified project design (key visuals, banners, flyers, posters, programme)
- Project campaign and accompanying social media campaigns in all countries
- Media partnerships (arte, MDR and others), accompanying video documentation
- Scientific assistance by research institutes and subsequent publication in specialist media
- Project website as a central structure: [www.europasinfonie.eu](http://www.europasinfonie.eu)
- Press conferences and press releases
- Promotion on local radio and TV
- Concert Livestream



## Dresdner Sinfoniker

The Dresdner Sinfoniker are Dresden's orchestra for contemporary music. The ensemble's productions have received numerous awards, for example the ECHO Klassik, the UNESCO Special Prize "World Horizon" and the Saxon Initiative Prize for Art and Culture.

The Dresdner Sinfoniker are a laboratory for multimedia projects. Their multi-faceted performances are always exceptional: instead of sitting in an orchestra pit, the orchestra is seated on the balconies of an industrialised apartment block as during the Hochhausinfonie in 2006; or the conductor, instead of standing in front of his musicians, is broadcast live, like a hologram from another world, as in Ferndirigat in 2008. The Dresdner Sinfoniker's large-scale events, featuring live performance from various artistic disciplines, are complex musical productions. They have the artistic power to make audiences sit up and take notice.

For years the spectacular projects of Dresdner Sinfoniker have combined music with socio-political issues. In 2016 they created international headlines with their German-Turkish-Armenian concert aghet – ađıt, a project in commemoration of the Armenian genocide. The orchestra knows what civil courage and free thinking can achieve: most members witnessed the peaceful revolution in East-Germany first-hand. In 1989, their artistic director and cofounder Markus Rindt fled East Germany, using the German embassy in Prague as a passage to freedom.

[www.dresdner-sinfoniker.de](http://www.dresdner-sinfoniker.de)



## Andrea Molino

### Conductor of Europasinfonie

Andrea Molino is one of the most distinguished and versatile conductors and composers of our time. Born in Italy, he studied in Turin, Milan and Venice, among other places, and now lives in Paris and Zurich. He realises his multimedia projects throughout Europe, while numerous other engagements have taken him to Sydney, Melbourne and Brisbane. Since 2006, Andrea Molino has been working closely with the Dresdner Sinfoniker. Molino's special interest lies in the investigation of musical and historico-cultural layers and collective memories, which in their sum constitute our culture. He wants to make this complexity visible and tangible for the audience and develops his own multimedia formats for this purpose. This has led, among other things, to a collaboration with the Research Institute of the Italian Broadcasting Corporation RAI.

From 2000 to 2006, Andrea Molino was artistic director of the music department of "Fabrica", a world-renowned think tank for cultural and artistic communication based in Treviso. Here, Molino worked to network actors from art, culture and research, international architects, musicians, historians, designers and artists.

Molino's own current work "Chants de fragilité - Quatre études sur la persistance de la mémoire" is dedicated to Peter Tchaikovsky and those places in Switzerland where he wrote his violin concerto. "Chants de fragilité" is a complex approach to a composer by means of allusions, intuitions, memories and visual elements. Together with violinist Christian Tetzlaff, the work was premiered on 9 December 2021 at the LAC cultural centre in Lugano.



## Dr Alexander Carôt

### Chief Technical Engineer

Dr Alexander Carôt's strongly interdisciplinary profile is shaped on the one hand by physics, computer science and electrical engineering, and on the other by various musical activities as bass and NS-Chapman-Stick player in numerous rock, pop and jazz ensembles. As part of his work as a computer scientist and freelance artist, he has lived and worked in Hamburg, Copenhagen, Barcelona, Porto and San Francisco. In 2004 he received a German engineering diploma within an interdisciplinary study program to combine the arts and technology. Motivated by the passion for remote concert performances with musicians in different places, he completed his PhD in computer science in 2009 at the University of Lübeck. He was appointed full professor in media computer science at the University of Applied Sciences, Anhalt, in 2010. He received his state doctorate in audio communication at the Technical University of Berlin in 2021.

Since 2005 he has been developing the Soundjack software, used in numerous network music performances worldwide. Besides continuously improving Soundjack regarding signal latency, quality, and usability, he plays in various remote music ensembles. In his recent research and development activities, he focuses on novel multimodal delay-optimized transmission approaches, especially in the context of musical ensembles with up to 100 participants.

[www.soundjack.eu](http://www.soundjack.eu)