



# Let's imagine beyond limits with *Lang Lang*

Telefónica centenary  
commemorative concert

26th February 2024



Gran Teatre del Liceu

# 100 years *leading* change

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It is a real honour to address you as Chairman of Telefónica at such a special time for our company. We are very happy to celebrate Telefónica's first centenary event in Barcelona, the city that brings together the world's telecommunications industry every year at the Mobile World Congress.

We are very grateful to all the customers, shareholders, employees, partners and suppliers who have been by our side throughout our first 100 years.

And we are already looking forward to continuing to imagine what we will be able to do together in the next 100 years.



**José María Álvarez-Pallete**  
Chairman and CEO of Telefónica S.A.

# Artistic Programme

## Let's imagine beyond limits

### *with Lang Lang*

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Telefónica is celebrating a hundred years. This is the 100th anniversary of this cutting-edge company, which puts innovation and technology to help connect people.

There are few better places than the Gran Teatre del Liceu to celebrate this anniversary, a theatre that has been supported by Telefónica for many years. And few better artists than Lang Lang, recognised as one of today's most acclaimed pianists and who was an ambassador for the company a decade ago.

The Telefónica Centenary concert deserves an exceptional development, in which art and technology go hand in hand to merge the real and the virtual world. The works we are going to listen to are divided into three parts: Landscapes, Introspection and Let's imagine without limits.

With the three musical blocks of the recital we live a singular experience. A new way of understanding the connection between the artist and the audience, who, at the same time, will make a journey to the heart of music uniting art and technology.

*Igor Cortadellas*

# Artistic Programme

## Part I: *Landscapes*

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In the initial block, the repertoire takes us from the introspective to the festive, from the immaterial to the tangible. The lighting and the scenic treatment have the mission of promoting a bridge of communication through which the link between the artist and the audience flows.

We created a space that highlights the transmission of emotion, while enhancing the delight of listening through the suggestive design of a discreet and respectful support, as well as a minimalist treatment of light and the transformation of the stage space.

Lang Lang's interpretation expands to create visual landscapes. Suggesting rather than telling. Simply inviting you to be carried away by the beauty of the music.

### **Aria from Goldberg Variations, BWV 988**

*Johann Sebastian Bach*

### **To Spring Op. 43 № 6 from Lyric Pieces**

*Edvard Grieg*

### **Clair de Lune L. 75 № 3 from Suite Bergamasque**

*Claude Debussy*

### **Doctor Gradus ad Parnassum L. 113 № 1 from Children's Corner**

*Claude Debussy*

### **Song Without Words Op. 67 № 4 in C major**

*Felix Mendelssohn*

### **Maple Leaf Rag**

*Scott Joplin*

### **Danza Ritual del Fuego from El Amor Brujo**

*Manuel de Falla*

# Artistic Programme

## Part II: *Instrospection*

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In the second part, we enter the heart of the artist, into his most intimate self. We breathe with Lang Lang, who shows us the intimate feeling of his soul that manifests itself to the spectator with the beauty of sound and visual projection. This part of the show is a window that opens before us, showing us a music box in which technology highlights the projection of the artist's emotions.

The process of transforming emotions into a visual projection is built from the set of data captured by sensors installed on the artist. Finally, his emotional reactions are sent to a program that, in real time, makes a dynamic translation to a terrain whose result is projected on a macro-screen. Visual art is thus added to the essence of the concert, sharing its ephemeral and unrepeatable poetry.

### **Prelude in C major BWV 846 from The Well-Tempered Clavier**

*Johann Sebastian Bach*

### **Bagatelle № 25 in A minor WoO 59, "Für Elise"**

*Ludwig van Beethoven*

### **Moment Musical in F minor D 780 № 3**

*Franz Schubert*

### **Minuet № 2 in G Minor**

*Christian Petzold*

*(Formerly Attributed to Johann Sebastian Bach as BWV Anh. 115)*

### **Rondo Alla Turca**

*From Piano Sonata № 11 in A major K 331 | Wolfgang Amadeus Mozart*

## Artistic Programme

### Part III: *Let's imagine beyond limits*

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Culminating this journey, we enter a final part of the journey in which technology continues to enhance a space of communication between the public and the artist. It is time for the creation of an interactive collective work to celebrate Telefónica's anniversary.

Now the audience of the Gran Teatre del Liceu will intervene to perform a duet with Lang Lang. A piano with 1000 hands.

The public, by means of the light of their cell phones and making very simple movements with their hands, generate chords mixed with sounds of nature. The music activated by the public establishes a sound mosaic to complement the performance by Lang Lang.

By means of a camera system that captures the light impulses of the audience, high-resolution video streams are processed. The result of the process is sent to a server that, in real time, receives the input from the audience to generate the sounds that complement the artist.

After this ephemeral moment, we reach the last breath of the concert with a performance that invites us to go beyond the limits. It is a song to the imagination, to fantasy. Thanks to holographic technology we can live a shared illusion.

# Lang Lang

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*"The most popular artist in the classical music world may be the Chinese pianist Lang Lang".*

*The New York Times*

Pianist, educator and philanthropist, Lang Lang is one of the most influential and committed ambassadors for the arts in the 21st century.

He began playing the piano at the age of three and gave his first recital before he was five. He was seventeen when his first big break came when he replaced André Watts at the Century Gala with the Chicago Symphony Orchestra. Since then, he has been giving sold-out concerts all over the world.

Lang Lang is world-renowned for his innovative ideas and his frequent ventures into different musical worlds: from the opening of the 2008 Beijing Olympics to performances at the Grammy Awards with Metallica, Pharrell Williams or Herbie Hancock.

In 2008 he created the "Lang Lang International Music Foundation" to train the best pianists of tomorrow, champion music education and build a young audience. Thanks to his commitment to global education through music, in 2013 he was designated "Messenger of Peace" by the Secretary General of the United Nations.

# Igor Cortadellas

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*"Igor Cortadellas' creative vision combines poetics, art and emotionality with a deep understanding of the digital and technological world".*

His career began at the Zürcher Hochschule der Künste (Switzerland) where he graduated as an oboist, beginning a professional career as a performer and teacher of this instrument.

In 2008 he founded "Igor Studio" as a confluence of his passions, music and photography, with the vision of applying audiovisual creativity to the world of classical music. His purpose is to connect human beings through that which distinguishes them: the ability to be moved.

His artistic and humanist vocation is reflected in his proposals, which range from a virtual reality film to the creation of projects and global campaigns tailored to the institutions and artists he works with (Gustavo Dudamel, Cecilia Bartoli, Martha Argerich, Valeri Gergiev, Gran Teatre del Liceu, Fundación La Caixa, Deutsche Gramophon...).

In recent years, his work has been recognised with several awards, including: Selection at the Cannes Film Festival, Vancouver International Film Festival, THEA AWARDS for the Symphony project and the LUX 2023 awards. Recently, his creative proposal has won the project competition for the opening ceremony of the 37th America's Cup to be held in his hometown, Barcelona.



# *Technology* at the service of art

Enrique Blanco (CTO Telefónica)

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In the third part of the concert, spectators will live an immersive experience that will mix the real and virtual world on the same stage and at the same time, allowing interaction between the two. The audience will see Lang Lang playing on a holographic piano while his virtual projection will play on a real piano on the same stage.

This masterpiece will be the result of the perfect combination of holographic technology, a high-capacity 5G network and a high-resolution piano player. The real piano is able to receive Lang Lang's live performance on the holographic piano and play it back. An innovative, patented technique is used to generate incredibly realistic holograms to be reproduced, allowing live and real objects to be mixed with virtual ones in the same space.

The key element of this show is a standalone 5G private network - similar to our commercial 5G networks - which provides the minimum latency required for this show, delivering real-time excitement. The use of a private network ensures the delivery of secure and reliable connectivity to all resources involved, as the nature of the live event requires a real-time solution. This network also enables the transmission and reception of high-capacity data which, in combination with 5G-capable equipment (video codecs) produces high-quality holographic images.

The main technological challenge is the drastic reduction of latency required for real-time synchronisation, which does not allow any buffering. Therefore, the movements of the real pianist, including his hands, must be synchronised with his holographic projection, to ensure that any minimal delay is imperceptible to the human eye.

As a result of all this work, we will offer the audience a great artistic event combined with state-of-the-art technology. Imagine what we will be able to do in the coming years.



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# Building the future of entertainment with 5G technology

Immersive fan experiences



# Concert technology partner



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On the occasion of Telefónica's 100 anniversary year we are jointly creating a remarkable experience to make the centenary shine. This is about showcasing how the power and unique characteristics of the most advanced 5G technology, together with the emotion of music, could enable an unprecedented experience where real and virtual objects and representations connect and interact like never before.

To provide such experience, Telefónica and Ericsson have built a 5G standalone Private Network at the Barcelona Liceo Theater to secure the needed requirements of uplink bandwidth and low latency. The solution is based on Ericsson Private 5G network (EP5G) configured for 5GSA using 100Mhz of Telefónica's mid band spectrum (n78 or 3500 MHz band).

This 5G private network was confined inside the theatre and required the deployment of radio and core elements, as well as the GPS receiver- for the synchronization and as time source for the radio signals. All this network was configured remotely, using a secure connection to Ericsson Cloud Management, saving significant time and visits to Liceu. High resolution video and audio captured by the cameras, microphones, codecs, etc., and more important, its processing to create the holograms, was done locally at the theatre, leveraging on this 5G private network.

It is worth to mention the creation of the 3D hologram was possible thanks to a patented and innovative technique, which combined the 4K video captured by a reduced number of cameras and 5G codecs, as well as a specific projection and lighting, creating the illusion of a 3D hologram that can interact with the real world.

With Ericsson 5G technology and solutions we are shaping an exciting and positive future. Get ready to make the unimaginable possible. This experience will take you to experience new dimensions of entertainment, blending technology and art. This is just a small example of what 5G limitless connectivity could enable.

# A team to *imagine* beyond limits

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**Igor Cortadellas**, Idea and creative direction

**Anna Llopart**, Stage direction

**María de la Cámara**, Set and lighting design

**Xavi Tribó**, Interactive director

**Dani López**, Musical composition

## *Igor Studio*

**Creative and Production Development:** Marc Campà, Maria Soler Chopo, Anna Verbon, Raül Esteve, Nacho Cossío

**Stage Manager:** Anna Cuscó, Marcel Solé

**Technical Direction:** Jordi Picazos

**Test I+D:** Bart Barenghi, Ricard Oliver, Blai Manyer

**Costumes:** José Novoa, Taller Goretti

**LED System:** VNG Tech Lighting, David Bofarull

**Sonorization:** Ferran Conangla, Enric Giné, Bernat Villà

**Broadcasting and Photography:** Eva Bret, Ignasi Castañé, Nils Dalmases, Damià Haro, Ana Lanz, Martí Milla, Alex Rademakers, Pau Sandaran

## *Cube*

**Scenography and Lighting:** María de la Cámara, Gabriel Paré, Isabel del Moral, Kike Blanco

## *Flock Art*

**Drones:** Fran Arnau, Ernest Biosca, Vasil Zhurman, Miguel Juan Lyons, Joel Johera, Joan Milà, Josep Maria Duró

## *XaviLab/Glassworks*

**Digital Creation and Interaction:** Xavi Tribó, Javier Verdugo, Clara Titos, Oriol Viñolas, Irene Ubieta, Joan Guillem Castell, Washington Neira

# A team to *imagine* beyond limits

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## *3D Musion*

**Hologram:** Ian O'Connell, Trent O'Connor, Dariusz Kozlowski, Nathan Gray, Richard Parnell, Chris Parnell, Martin Shepherd, Charles Day, Stephen Nicholas

## *Telefónica*

**Communication:** Pedro Calvo Martínez, Paz Cecilia Noriega Sanchez-Ocaña, Laura Sanz García, Iratxe Cabrales Aguirregoitia

**CTO:** Enrique Blanco, Esther Arellano Villanueva, Elena Serna Santiago

**Telefónica Team in Catalonia:** José Manuel Casas Aljama, Julian Vinue Biarnes

**Chairman's Office:** Beatriz Gutierrez García, Almudena Dujat, Sandra Abelleira González

**Marketing:** Rafael Fernández de Alarcón, Marta Alonso Geriz, Rocío Rey, Félix Sanz, Juan Manuel Ramírez Pascual, Alicia Ripalda Bello, Adrián Vélez, Fernando Antonio de Pablos Gil, Guillermo Patricio Catalano, Yamil Salinas

**ORTI:** Jaime Lluch, Sergi Barberán, José Manuel Álvarez Díaz, Raquel Senent, Antonio Polo Navarro, Edgar Duran

**Public Relations and Events:** José Antonio Prados, Anaya de Pedraza

## *Ericsson*

Andrés Vicente , Jorge Navais, Francisco Romar, Carlos González, Javier Valle, Ruth Amilburu, Cristina Mozos, Tomás Alonso, María Velasco, Carolina Levinton, Elena Blanco, Enrique Gil

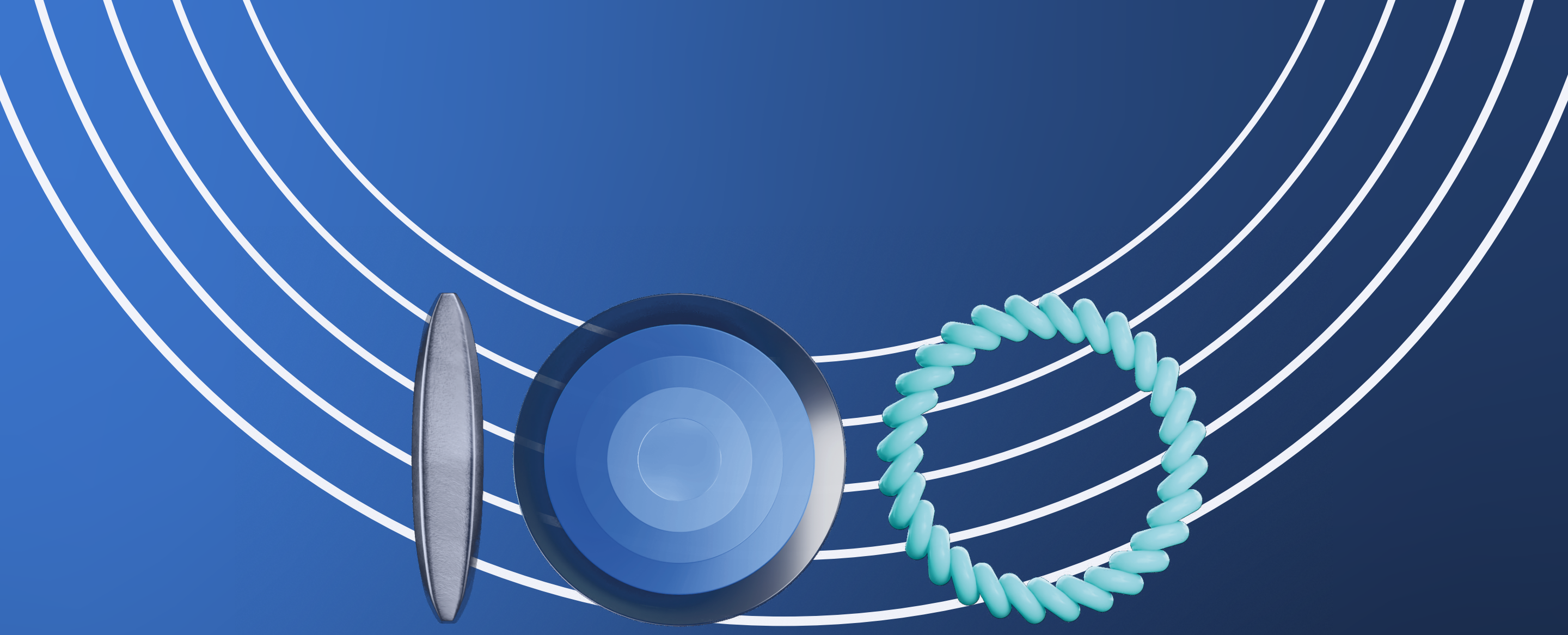
## *Teatre Gran Liceu*

Valentí Oviedo, Helena Roca, Paulina Soucheiron, Xavier Sagrera, Miguel Ángel García.

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And thanks to all those people who are not on this list, but helped us to IMAGINE this magnificent project.

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**Let's imagine**  
*beyond limits*

