



# Òpera Oberta and research and education networks bring opera to students across the world

## High capacity networks work together to broadcast performances to universities around the globe

Allowing students interested in the arts to experience cultural performances is central to sharing knowledge and helping them learn. However the scale and size of many productions, such as operas, mean that they cannot be staged locally due to a lack of resources and budget.

To bridge this gap and help make opera better known to students all around the world, the Gran Teatre del Liceu in Barcelona has created the Òpera Oberta programme. This produces and broadcasts high quality operatic performances to students in over 40 universities around the world. Since its foundation in 2001, Òpera Oberta has grown rapidly, and now has an average of 1,300 students from universities in Europe and Latin America watching every broadcast. Each performance is supported by a full package of learning materials, including a lecture before each opera outlining the plot and background, images and archived documentation. Students receive course credits for their virtual attendance, with every performance streamed simultaneously to all participating institutions.

As the operas are recorded using the most advanced broadcast video and sound technologies, sharing the files requires reliable, high capacity, cost-effective network links. Consequently Òpera Oberta relies on the speed and power of research and education networks, which deliver the guaranteed performance to ensure that every student receives a high quality experience.

The number of universities involved and their locations across the globe make simultaneous transmission a technical challenge. This is solved through a collaboration between a growing number of National Research and Education Networks (NRENs) and their international counterparts.

Broadcast files are first sent using multicast IP from the Liceu to the Catalan Research and Education Network, managed by CSUC, which is connected to the Spanish RedIRIS network. The high speed pan-European GÉANT network then transmits the performances across the continent to NRENs in individual countries, such as GRNET in Greece, and, worldwide through its global links to networks in other regions. For example, in Latin America the RedCLARA network then distributes the broadcast to the NRENs of Columbia (RENATA), Mexico (CUDI) and Ecuador (CEDIA). The NRENs then transmit the opera to individual universities in each country. The advanced multicast IP technology used makes it possible to send the same stream simultaneously to all participating institutions, wherever they are located, reducing complexity and minimising delays.



L'incoronazione di Poppea, © Rubén Ferrer Cherta

### The Challenge

To introduce students to opera by combining world class performances with the latest broadcasting technologies.

### The Solution

Performances are broadcast simultaneously using multicast technology across national and international research and education networks, such as GÉANT and RedIRIS, providing a compelling experience for students around the world.

### Key Benefits

Wherever they are students can learn about and experience the beauty of opera through high quality broadcasts, thanks to the collaboration between Òpera Oberta and research and education networks.





When the Òpera Oberta programme set itself the unprecedented technological challenge of offering live opera broadcasts to the academic community, research and education networks as well as the availability of suitable communications technologies became an essential player, without which the project would not have been possible. Flexibility, service adaptation and community are the contributions which GÉANT has provided to the Foundation of the Gran Teatre del Liceu, making possible its objective to carry out innovative initiatives for the cultural and artistic empowerment of society.

*Xavier Carreras Díaz, Technical Coordinator, Òpera Oberta, 2009–2014*

At the Liceu Theatre every opera is recorded and then encoded and compressed using advanced techniques that make it possible to create a single file containing video, audio and subtitles in three languages (English, Spanish and Catalan).

Despite the great distances and large file sizes of the broadcast, students all receive the chance to watch and listen to the same, high quality performance. The aim is to provide an experience similar to actually being seated in the theatre, with all the technical complexity handled by the collaboration between participating institutions, supported by research and education networks.

Over the last 12 years, operas from composers as varied as Britten, Mozart and Donizetti have been shared globally through Òpera Oberta's broadcasts. By merging art, academia and technology thousands of students across the world have been introduced to opera, providing a rich cultural and learning experience thanks to the combination of Òpera Oberta and the power and reach of research and education networks.



For Cauca University it is a privilege to have access to the Òpera Oberta course and be able to make it available to our whole academic community. We see this initiative as the most important experience in the world in relation to cultural and pedagogical production using advanced research and education networks, which are essential in making it possible. Over the past three years our students have had the unique chance to learn about opera of the highest quality.

*Jaime Leonardo Martínez, IT Director and Òpera Oberta Coordinator at the University of Cauca, Colombia*



La fille du regiment, © David Cabrera



The Aristotle University of Thessaloniki has integrated the Òpera Oberta project into a horizontal academic programme. Students enrolled in that course attend scheduled opera broadcasts and common academic lectures, earning academic credits. The program also involves the participation of students in the technical production of the opera broadcasts and the realization and sharing of educational content in both Greek and English.

*Dimitros A. Adamos, Òpera Oberta Coordinator, Aristotle University, Thessaloniki, Greece.*

## connect • communicate • collaborate

The world is criss-crossed with high-capacity data communications networks, connecting and serving research and academic institutions across the globe. The most advanced of these is GÉANT, serving Europe. GÉANT interconnects with counterparts across the world, such as RedCLARA in Latin America.

Separate from the public Internet for reasons of security and performance, many of these networks are designed, deployed and run by the networking organisation DANTE and make an enormous practical contribution to research in a wide variety of areas – saving lives, building knowledge, and sharing cultural and educational resources all over the world.

GÉANT and its regional and national research and education network partners provide Òpera Oberta with the high speed, high capacity connections needed to broadcast high quality performances around the globe. This provides a seamless experience to students, whatever country they are in and enables them to focus on increasing their learning and understanding of opera. Without access to research and education networks to link universities together and transmit large audio-visual files fewer students would benefit from in-depth learning within their courses.



### For more information:

Òpera Oberta: [www.operaoberta.org](http://www.operaoberta.org)  
CSUC: [www.csuc.cat](http://www.csuc.cat)  
RedIRIS: [www.rediris.es](http://www.rediris.es)

GRNET: [www.grnet.gr](http://www.grnet.gr)  
GÉANT: [www.geant.net](http://www.geant.net)  
RedCLARA: [www.redclara.net](http://www.redclara.net)

