

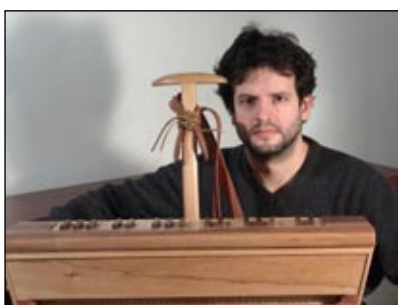
Leonardo's Harpsichord-Viola

A one-of-a-kind musical instrument designed by Leonardo—with the keyboard of a piano and the sound of a viola—has been reconstructed and played for the first time in history!

Milan, 16 March 2010. Leonardo designed many different musical instruments: popular ones like mechanical drums and wind instruments; complex ones like organs or the legendary silver lyre with which he presented himself to the Duke of Milan. In fact, according to an anonymous contemporary writer, the so-called as Anonimo Gaddiano, Leonardo was the only one who could “play that instrument,” which he had designed himself (*Codex Ashburnham 2037*). Even Giorgio Vasari recounts the episode: “*Leonardo took with him a lyre that he had made himself, mostly of silver, in the shape of a horse’s head (a very strange and novel design) so that the sound should be more sonorous and resonant. Leonardo’s performance was therefore superior to that of all the other musicians who had come to Ludovico’s court.*”

Leonardo is indeed known for being a great connoisseur of the musical arts. He also designed some instruments that were totally unprecedented—genuine inventions. The most famous of these is the *Viola Organista* (folio 586r of the *Codex Atlanticus*), which was widely studied and reconstructed throughout the last century. This is not to be confused with the *Harpsichord-Viola*, a complicated instrument that has never been reconstructed or interpreted before because of its complex design and the challenges inherent in making it.

This unique instrument was first interpreted and reconstructed digitally by Leonardo3 scholar Edoardo Zanon in 2005. Since then, the design has continued to evolve through dozens of three-dimensional models and preliminary physical prototypes. The *Harpsichord-Viola* is the first perfectly functioning reconstruction ever produced, proving that Leonardo’s designs can actually be put into practice.



Edoardo Zanon
Co-founder and co-scientific director of
Leonardo3

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The *Harpsichord-Viola* is incredibly complex and innovative. Its design is fully described on folio 93r of the *Codex Atlanticus*, even though a part of the page has gone missing. While the sheet contains several drawings and constructive details, there is very little text. It has nevertheless been possible to reconstruct the design, thus indicating the very likely possibility that Leonardo himself was able to build it. As Edoardo Zanon says, “to achieve the level of detail found in the *Codex Atlanticus* folio, Leonardo must have tried to make the instrument. While he may not have arrived at a definitive result, he surely built some preliminary prototypes just as we have done.”

The *Harpsichord-Viola* has a keyboard similar to those of organs and harpsichords, which came shortly after Leonardo’s time, but it produces the sound of a bowed instrument like a viola. “*Leonardo invented a totally new instrument,*” continues Zanon, “*a technological mix that brought together the polyphony of a keyboard instrument (or the ability to play several sounds at once) with the sonorous qualities of a bowed one, like the viola. That’s why we baptized it the Harpsichord-Viola.*”



But how did it work? *"The musician could wear it using a harness that Leonardo drew clearly. As he walked, a rod tied to the musician's ankle would activate the complex motor system that would in turn set a pitch-soaked band in motion. By pressing the keys of the keyboard, the musician would make strings come into contact with the band, thus producing a sound."*

The instrument presented today works perfectly. From 17 March onwards it will be on display for the first time ever in the show *Leonardo's Workshop*, at *Vigevano Castle*. More than a hundred thousand visitors have already come to see the show, which was also produced by the Leonardo3 research center and is a not-to-be-missed event. On the occasion of the *Harpsichord-Viola's* unveiling, it was announced that the show will be extended until 13 June 2010 so that everyone has a chance to come and discover this remarkable instrument (go to www.leonardo3.net for more information).

Leonardo3 entrusted the construction of the instrument to luthier **Marco Minnozzi** and his partner **Pino Zampiga**. *"We encountered several problems in constructing it,"* says **Minnozzi**, *"which plausibly explains why this "sound machine" remained hidden for*

Details of the keyboard and the harness with which to "wear" the instrument

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so long. Despite the intuitive brilliance behind it, its design presents obstacles that even the most experienced Renaissance instrument makers would have had difficulties overcoming. Among other things, the motor apparatus is rather ineffective, excessively loud and problematic for the musician to use. That's why I think that if Leonardo tried to build it himself, he would surely have abandoned the idea in the absence of effective technical solutions." However, according to **Zanon**, *"from a historical point of view, it's important that we put aside the question of whether or not Leonardo ever built the instrument. The design is valid and the ideas and indications Leonardo sketched on the folio are precise. The idea is truly ingenious."*

"Leonardo invented a totally new musical instrument that was never developed further because of the technical limitations of his day," **Massimiliano Lisa**, **Leonardo3's** CEO, concludes. *"But his solutions work and making the sound of a viola with a polyphonic keyboard instrument is interesting. That's why we're also thinking about developing a modern version of the instrument. Maybe, five hundred years after its invention, musicians will adopt the Harpsichord-Viola as a new instrument. This is Leonardo's most extraordinary invention. Unlike all the others, we can actually make it and use it today, without progress having proposed any alternatives in the meantime."*

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The Leonardo3 research center uses innovative technologies and methods to interpret cultural heritage. It shares its results with the public through exhibitions and publications produced by the center itself, thanks to the financial support that has resulted from its international success. L3 has created exhibitions and sold its publications in museums throughout the world (including in Italy, the United States, Japan, Qatar, Saudi Arabia, Kuwait, Bahrain, Mexico, Brazil, Spain, Germany, China and Korea).

The *Harpsichord-Viola*
Leonardo da Vinci
Codex Atlanticus, f. 93r

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