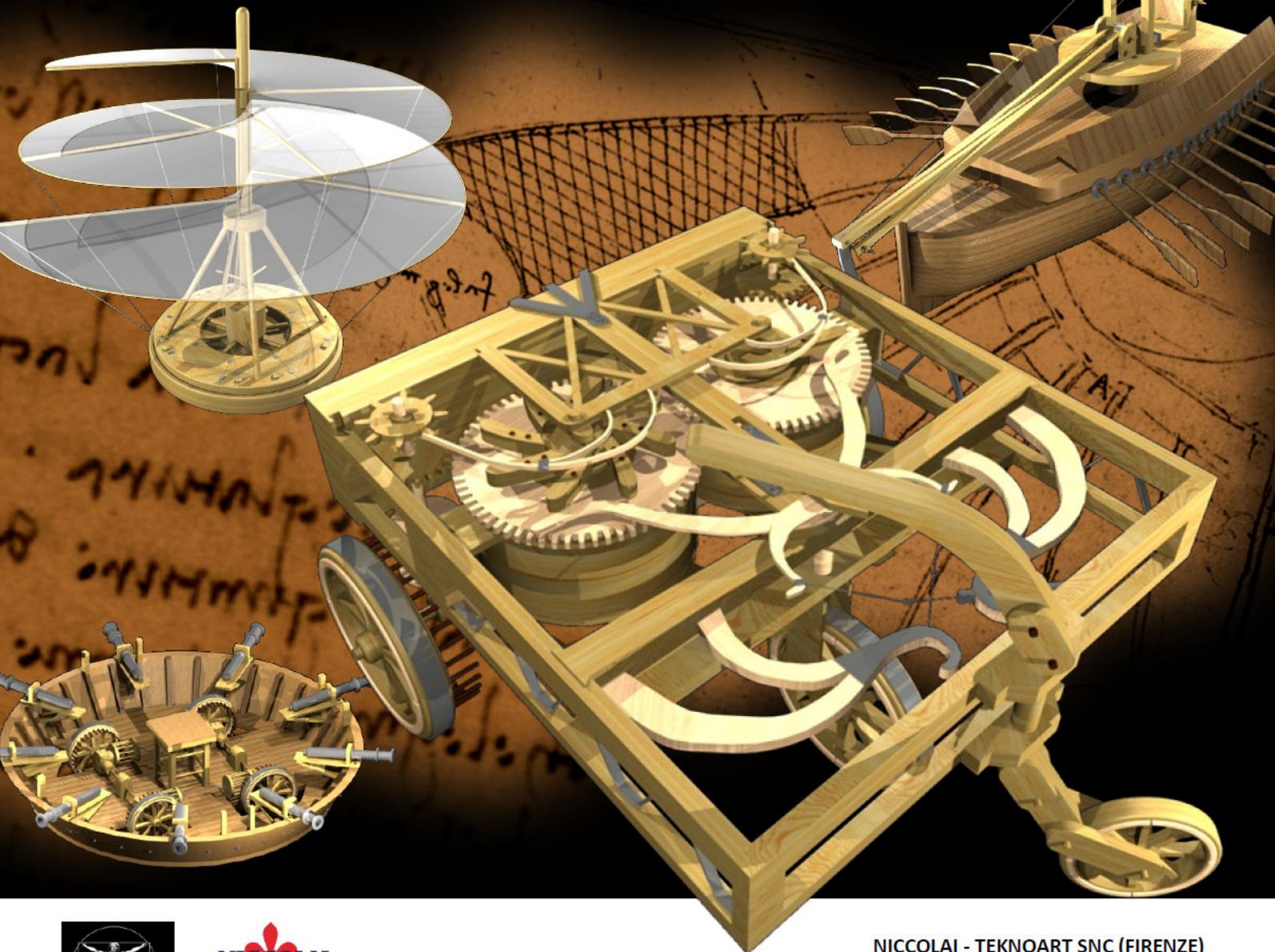


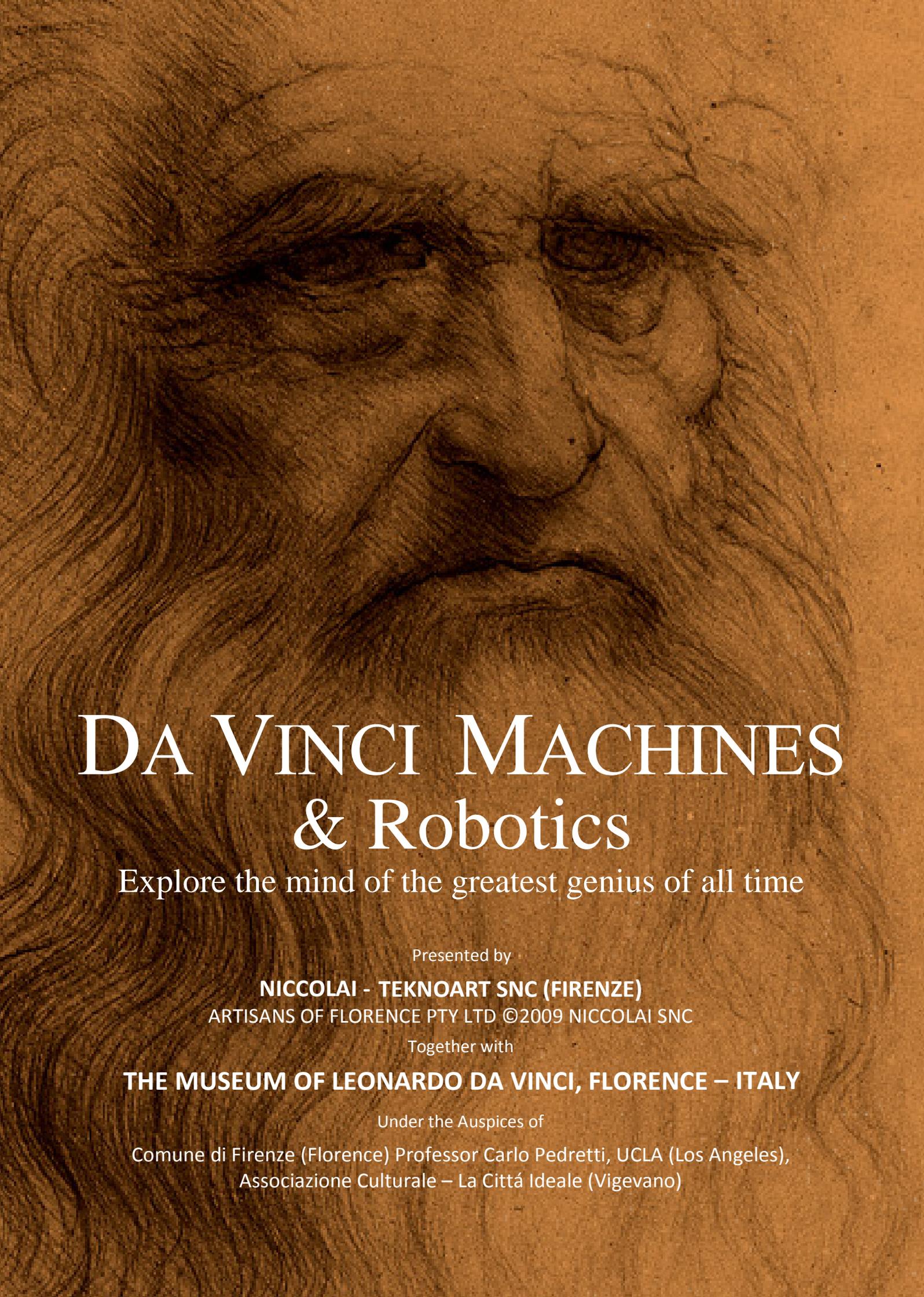
# DAVINCI MACHINES & Robotics

Interactive and Working Machines Brought to Life as Leonardo Intended  
Created by World Acclaimed NICCOLAI TEKNOART, Florence



**NICCOLAI**  
SNC  
TEKNOART  
FIRENZE

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# DA VINCI MACHINES & Robotics

Explore the mind of the greatest genius of all time

Presented by

**NICCOLAI - TEKNOART SNC (FIRENZE)**

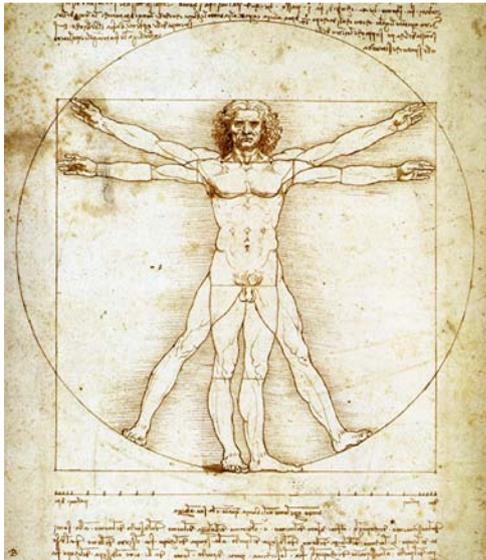
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Together with

**THE MUSEUM OF LEONARDO DA VINCI, FLORENCE – ITALY**

Under the Auspices of

Comune di Firenze (Florence) Professor Carlo Pedretti, UCLA (Los Angeles),  
Associazione Culturale – La Città Ideale (Vigevano)



### VITRUVIAN MAN

*The line of text immediately below the drawing of Vitruvian Man, written in Leonardo's characteristic right to left mirror writings reads "the length of a man's outspread arms is equal to his height".*

*Other notes below the drawing read:*

*From the roots of his hair to the bottom of his chin is 1/10 of a man's height*

*From the bottom of the chin to the top of the head is 1/8 of his height*

*From the top of the breast to the roots of the hair will be the 7th part of the whole man*

*From the nipples to the top of the head will be the 4th part of man*

*The greatest width of the shoulders contains in itself the 4th part of man*

*From the elbow to the tip of the hand will be the 5th part of a man*

*From the elbow to the angle of the armpit will be the 8th part of man*

*The whole hand will be the 10th part of the man*

*The distance from the bottom of the chin to the nose and from the roots of the hair to the eyebrows is, in each case the same, and like the ear, a third of the face.*

*Leonardo da Vinci*

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## MESSAGE FROM THE DIRECTOR & CHIEF EXECUTIVE OFFICER

Early 2002 in Florence, when I met the dynamo Niccolai family duo, father Carlo and son Gabriele, I begged them to allow me to take their wonderful da Vinci machines to Museums around the world. It took some convincing, two years in fact, and after leaving a son behind (as you would in any respectable long lasting medieval contract) I had begun a most exciting, exhibition career and really thought the game was well and truly won over.

Then along came Dan Brown, who alerted the world of the many secrets our Renaissance master was hiding and the scene became a frenzied gold rush of pseudo da Vinci shows, hastily built in a few months by sensationalists and quick-buck profiteers.

There were indeed a number of niggling mysteries surrounding da Vinci, but it was clear to academia and the serious Vincian researchers that Dan Brown was looking in the wrong direction.

Yes, there were missing paintings and the known ones had many hidden cryptic messages (the art historians daily bread and butter) however, many of 'Da Vinci's secrets' were hidden in his machines.

You could certainly expect that in an era lacking patents or copyright protection, one writing mirror image would indeed raise suspicions. Particularly mysterious are the last few years of Da Vinci's life, where apparently he did very little at the King's pleasure... Surely, can you really believe that of Leonardo...? The man who left us 14,000 technical drawings, only after the other two thirds went missing posthumously...?

The task for the Niccolai Group team was daunting and specialised help was sought. Our group expanded with new partners, Sara Tagliagambara (Historian), Mirko Marini (Architect) for animations, Antonio De Vito, acclaimed master of fresco painting whose recreation of the lost *Battle of Anghiari* was hanging in the Museum of Anghiari itself, and the CreaFx young duo, Elena Sardelli and Danilo Carignola (Special Effects) who draw their inspiration from *La Specola* a Florentine wonder, the most amazing museum of anatomical wax reconstructions.

So we (Niccolai Teknoart) began from scratch, revisiting Da Vinci's anatomical studies, repainting his lost works and re-interpreting - even decrypting his notes and instructions in the search for the elusive "missing machines".

Gabriele and I visited world centres for robotics such as MIT in Boston and Milan, but it was clear to us, that with over 150 Vincian constructions under our belt, that we were at the cutting edge of research and well prepared for revealing the *biomimetic* secret studies of Leonardo da Vinci.

By the time the date to launch the DA VINCI ROBOTICS Exhibition was upon us we had decoded artworks, reconstructed flying "drones", animal and human robots.

Our initial effort in constructing Da Vinci's robot produced a rather inanimate but fierce looking "Terminator". However, just as the opening of the Exhibition was due, Gabriele out of desperation, made the brilliant decision to use that "useless, unexplainable mechanical part" - discarded by all for its lack of modern application - that, for the first time, the Da Vinci Robot came to life!

Ironically, we had found the "Heart of *Ironman*". The historical evidence was now so plainly obvious. The result was a wonderful book by Niccolai and Tagliagambara, prefaced by Pedretti: *Leonardo da Vinci, Automats and Robotics* and the ultimate Leonardo da Vinci exhibition was born; the truly amazing, historically documented, **Da Vinci Robotics** covering his work in Art, Anatomy and Robotics.



Luigi Rizzo  
Director and CEO  
Artisans of Florence Pty Ltd  
THE NICCOLAI GROUP

## ABOUT THE MACHINES

### Leonardo Da Vinci Machines and Robots

My father Carlo Niccolai is a skilled Florentine craftsman whose life and passion has revolved around Leonardo da Vinci. He shared his knowledge, passion and his craft with me and together, since 1995 we have established Niccolai-Teknoart SNC and the Leonardo da Vinci Museum in Florence. For over 25 years now, with a dedicated team of artisans, artists and historians, we have been creating machines designed by Leonardo da Vinci which have been shown in numerous museums and exhibitions all around the world.

I first started researching and producing scale prototype machines, preparing for the construction of larger working models, in the early 1990's. To date these number approximately five hundred machines, created by the team of artisans at Niccolai-Teknoart, all meticulously made with materials of the era being wood, iron, cloth, ropes and bronze. In Da Vinci's day, wooden machines required protection from the weather. We replicate the same methods used back then in the workshop today. We discovered that the application of vegetable pitch (produced by burning selected pine in a precise methodology) produced a characteristic reddish brown colour in the wood, different from the natural light colour of just cut wood. We have been able to reproduce synthetically this characteristic colour derived from the precise application of this natural protective tar.

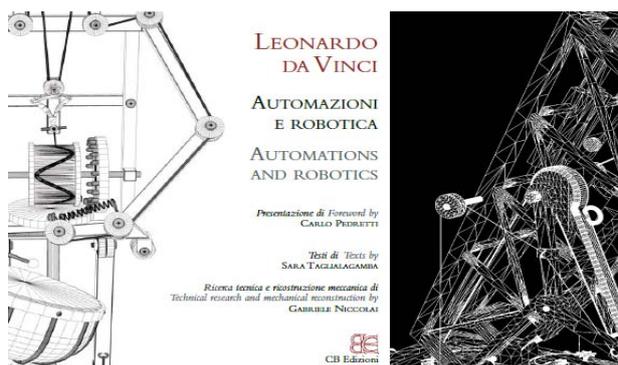


Over the past 20 years, the reconstruction of accurate, working, interactive models based on da Vinci's notes and drawings has been aided by the use of advanced computer cad technologies.

Over all we have created more than 150 functional models. The required research, patience and skill has been contributed equally by the whole team - it's been a long and challenging process but it's been extremely rewarding and satisfying.

As with the "robot", the main character of the DA VINCI ROBOTICS Exhibition, he's a perfect example. Leonardo drew his creation as a machine capable of drumming, but till now no one was able to figure out how it worked. Ironically all the relevant information was laid out in a single sheet, the now famous 579r of Codex Atlanticus, first identified by Carlo Pedretti as an *Automatic Knight* back in 1957. Other codex pages had to be consulted for the final piecing together of the mystery, or the *secret* if you like, in particular, of the one device. (*One can imagine Leonardo's deliberate effort to conceal this important detail from us... over the years I've become accustomed, amused to play this game with Leonardo as this process is repeated over and over with many of his machines reconstructions... this will be the subject of our next book.*) The device contained a rhythmic program that when installed inside the robot, created a drumming motion. This key "missing device" had been discarded by all, us included, for its problematic appearance and function. You can imagine my satisfaction in presenting Professor Pedretti with the final solution to his 1957 discovery.

The discovery of the device function together with other revelations on Leonardo da Vinci's humanoid and animal automatons and flying drones are the subject in the recently released book *Leonardo da Vinci Automatons and Robotics*, a collaborative project I worked on with Sara Tagliagamba with assistance from Carlo Pedretti.



Gabriele Niccolai  
Director of Projects  
Head of Research & Development  
THE NICCOLAI GROUP  
Artisans of Florence Pty Ltd

## ABOUT THE MACHINES

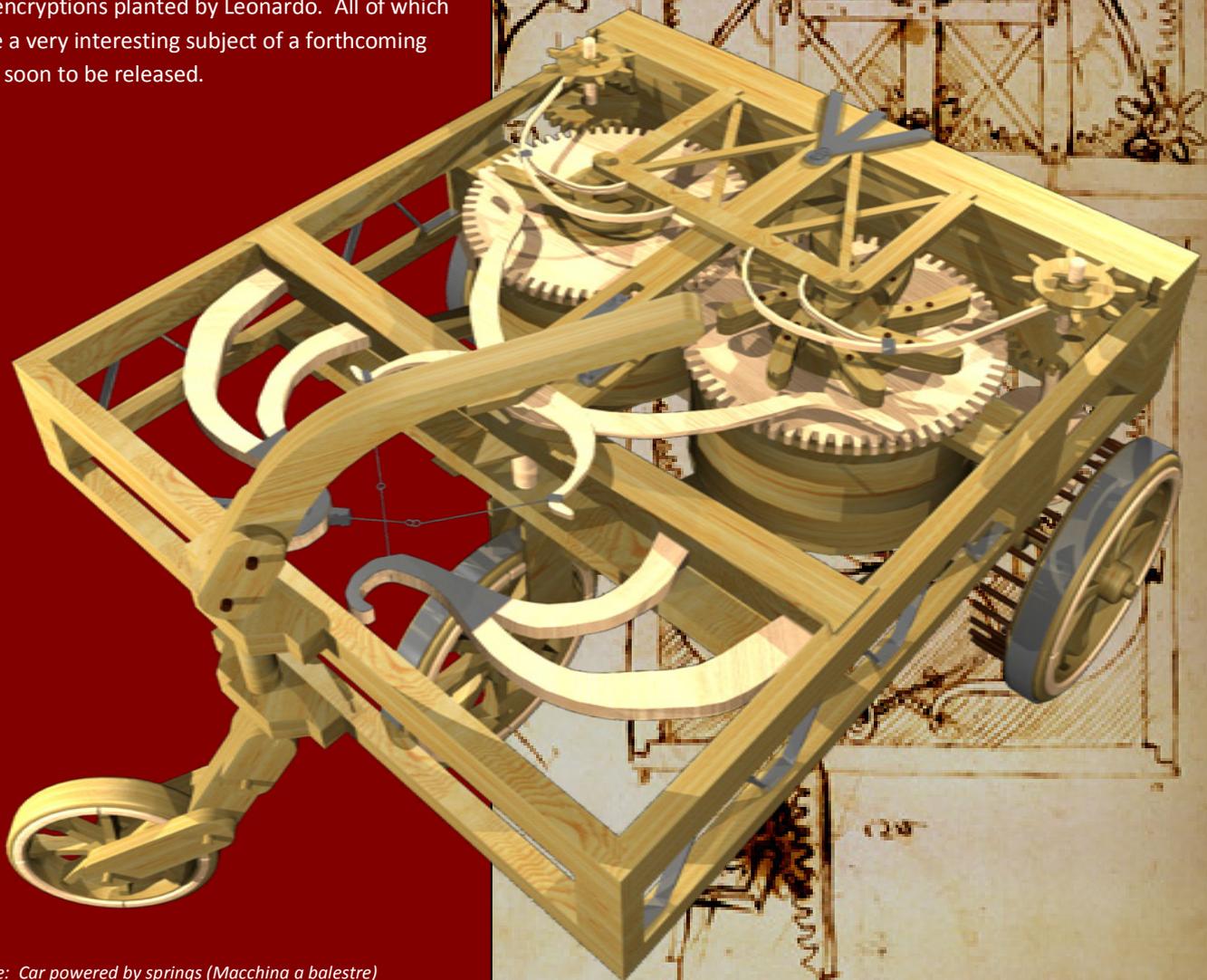
The machines displayed in the **DA VINCI MACHINES & ROBOTICS EXHIBITION** have been constructed over a number of years by the team of Florentine artisans from the **Niccolai-Teknoart** group.

They are the result of fine craftsmanship, interpretation, skill and modern day technology.

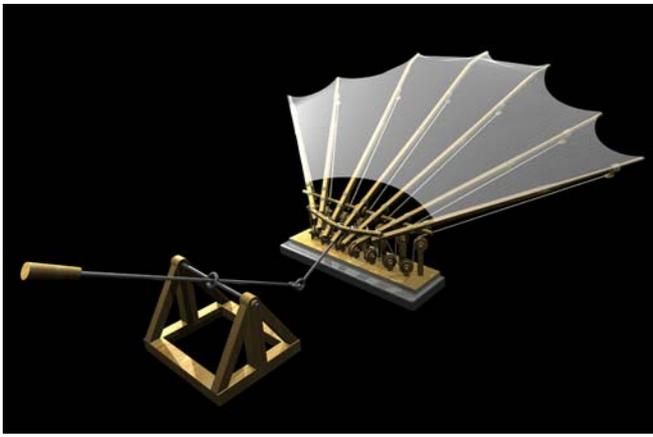
Firstly, the artisans pay particular attention to detail in order to reflect Leonardo's objectives; they use only materials of the time - wood, cotton, brass, iron and cord.

Then interpretation of language is very important as Leonardo used local idioms, familiar only to *Florentini*.

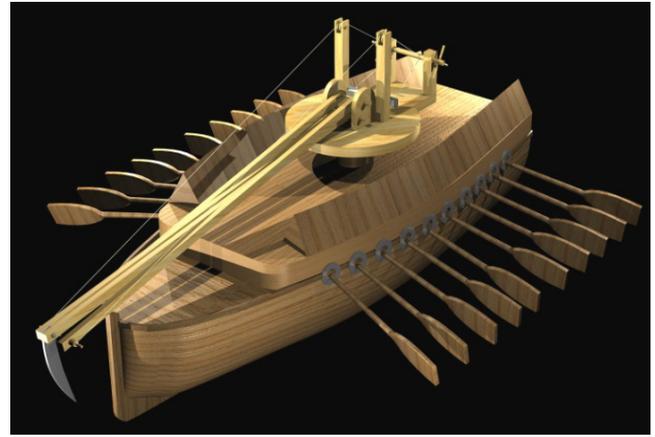
Computer technology is also part of the process, used to calculate the exact scale and proportion of each model and finally, there is a great deal of skill required to identify the secret clues, the decoys and encryptions planted by Leonardo. All of which make a very interesting subject of a forthcoming book soon to be released.



Above: Car powered by springs (*Macchina a balestre*)  
LV 12 Codice Atlanticus F.812r



Above: Flapping wing experiment (Ala Battente)  
LV 20 Manoscritto B.F.88v

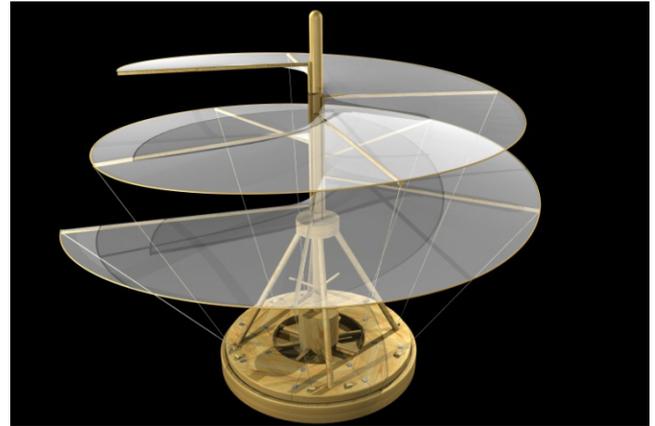


Above: Boat with blades 'The Scorpion' (Barca con Falce - Escorpio)  
LV 43 Codice Ashburnham 2037 F.8 r

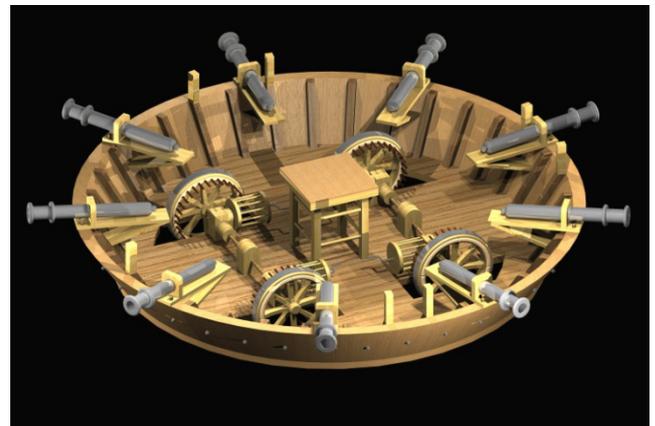
*The interactive machines (many of which are scale models and some are life size), are a popular aspect of the **DA VINCI MACHINES & ROBOTICS EXHIBITION** as visitors can touch and handle these models to gain a first-hand appreciation of how they work.*

Explanatory notes and illustrative panels with Leonardo's drawings accompany each model.

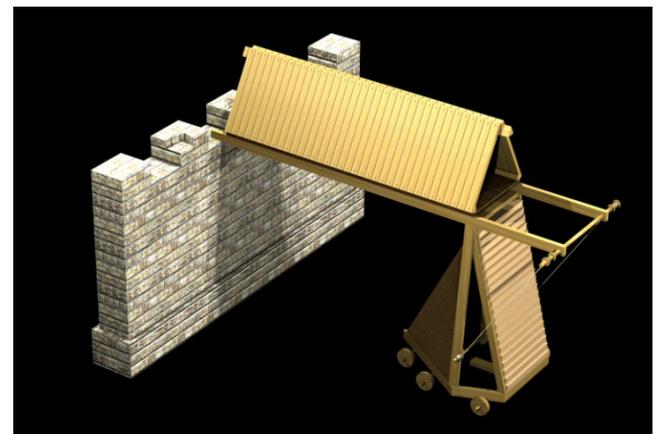
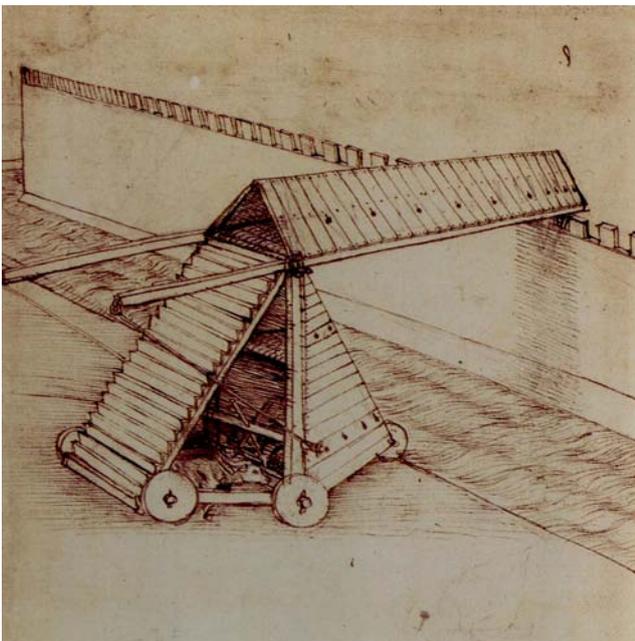
The copies of the Codices together with animated computer programs enhance the scientific, cultural and educational experience of each exhibit.



Above: Air screw (Vite aerea)  
LV 21 Manoscritto B. F.83 v



Above: Tank (Carro Armato)  
LV 57 Codex British Museum F.1030



Above and left: Defence of town walls (Difesa Delle Mura)  
LV 44 Codex Atlantico F.139 r

# ABOUT THE EXHIBITION

Leonardo da Vinci dedicated himself with passion to scientific studies in anatomy, biology, mathematics and physics. His manuscripts, known as **Codices**, exhibit ingenious solutions to practical problems of his time and he was able to imagine future possibilities such as flying machines and automation.



At Leonardo's death all his writings and sketches were inherited by his trusted assistant and scholar, Francesco Melzi. He kept and catalogued them carefully but after his death most of the work was dispersed. About a quarter of Leonardo's manuscripts have survived, most have been grouped by later scholars in Codices and Manuscripts of various chronology and size.

The original concept, worldwide, to create an exhibition of 'interactive machines' based on Leonardo's notebooks was conceived by the Niccolai Firm in the early 1990's.

**Over the past couple of years an expanded Niccolai, Teknoart, Artisans of Florence Group has been able to uncover further missing (hidden?) details, making the machines even more realistic. Thus creating a truly unique exhibition – one that is more relevant in today's society.**

Working in conjunction with the Leonardo da Vinci Museum in Florence and with the endorsement of eminent scholars and historians, the exhibition that 'brings to life' Leonardo's genius and inventions was realised. Since then the exhibition has travelled the world showing in major cities and centres that include Florence, Siena, Venice, Naples, Warsaw, Madrid, Berlin, Hong Kong, Dubai, Melbourne, Sydney, Perth, Canberra, Auckland, Taipei, Vienna, California, Texas, Montreal, Chicago, Detroit and now Hollywood.

**The DA VINCI MACHINES EXHIBITION proudly presents in excess of 60 machines from original da Vinci drawings. Featuring his amazing flying machines, nautical, hydraulic and architectural innovations, ground-breaking applications of civil engineering and incredible war machines. There are 15 high quality reproduction artworks, giant art panels, computer animations, film screenings and rare copies of Leonardo da Vinci Codices - Codex Atlanticus (1478–1519) the largest with 401 sheets, held in the Ambrosiana Library Milan, and Codex on Anatomy Windsor Collection (1502\_ 1513) Windsor Castle Royal Library, London**

The Exhibition is presented and displayed in themes:

- |                |                                 |
|----------------|---------------------------------|
| <b>Theme 1</b> | <b>Robotics</b>                 |
| <b>Theme 2</b> | <b>War Machines</b>             |
| <b>Theme 3</b> | <b>Flying Machines</b>          |
| <b>Theme 4</b> | <b>Nautical &amp; Hydraulic</b> |
| <b>Theme 5</b> | <b>Principles of Mechanics</b>  |
| <b>Theme 6</b> | <b>Artwork (Reproductions)</b>  |



THEME 2 – WAR MACHINES



THEME 3 – FLYING MACHINES



THEME 4 – NAUTICAL AND HYDRAULIC



THEME 5 – PRINCIPLES OF MECHANICS



THEME 6 – ARTWORK (REPRODUCTIONS)

# ROBOTICS - Theme 1

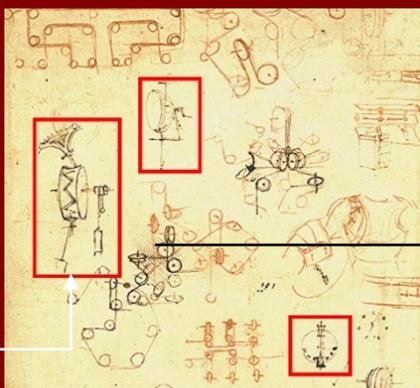
Among Leonardo's vast range of projects, in 1495 he sketched what is believed to be the world's first robot. It took the form of a human-shaped automaton, which is a machine that moves by mechanical means.

The drawings have now been realised as full-scale models, which were built strictly according to Leonardo's original specifications and display the inner workings of the robot, with pulleys and cables designed to replicate movement of the limbs and joints.

The mechanical frame was to be encased in medieval styled metal armour. The robot warrior was capable of performing human-like actions. As in Leonardo's original drawings, the robot's hand waves, the head nods, the body sits, and the anatomically correct jaw opens and closes.

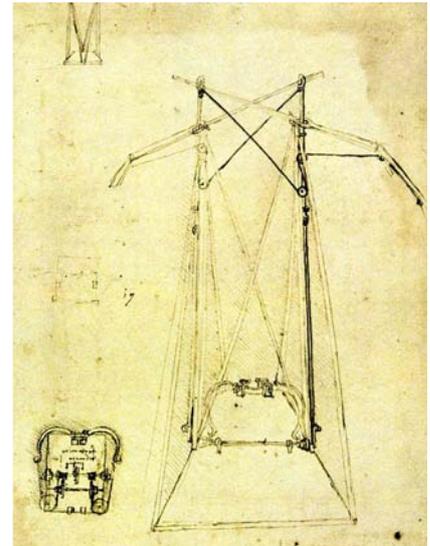
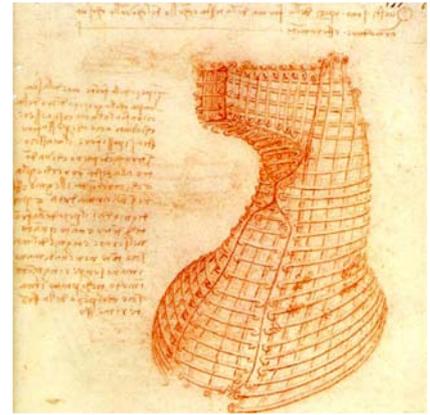
However when Teknoart sought to replicate Leonardo's design, the joints grinded and chafed. This was perplexing for the artisans.

Over a period of a year, they kept returning to the blueprint sketches of the robot in the Codex Atlanticus.

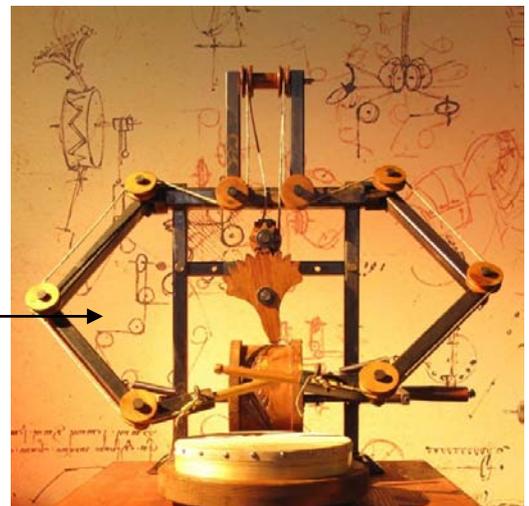


## The DISCOVERY

At last they made a breakthrough, they discovered a mechanism that contained a rhythmic program device which would drive the strings and direct the pulleys to the movement of the wrist. This in turn connected to rods which beat the sound of a drum. As soon as the focus shifted, all the other mechanical problems were minimised. As a result, this robot drums a consistent beat - a precursor to the drum machine.



Top right: Casting of the Horse Codex Madrid 11F 149r  
Above: Flying Robot (Drone) Codex Atlanticus F314 r-b



Centre right: The Robot Drummer  
Right: Robot Internal Mechanism  
Above: Robot metal armour  
Left: 'The missing device' Codex Atlanticus F 579r (detail)

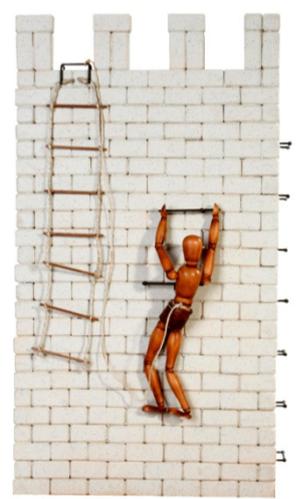
## WAR MACHINES – Theme 2

The Italian Renaissance peaked in the late 15<sup>th</sup> century as foreign invasions plunged the region into turmoil.

Although Leonardo's work on 'War Machines' seems to contradict his respect for nature, he was still a man of his time and the need for military engineers provided him with employment, travel opportunities and the chance to continue his scientific work unhindered.

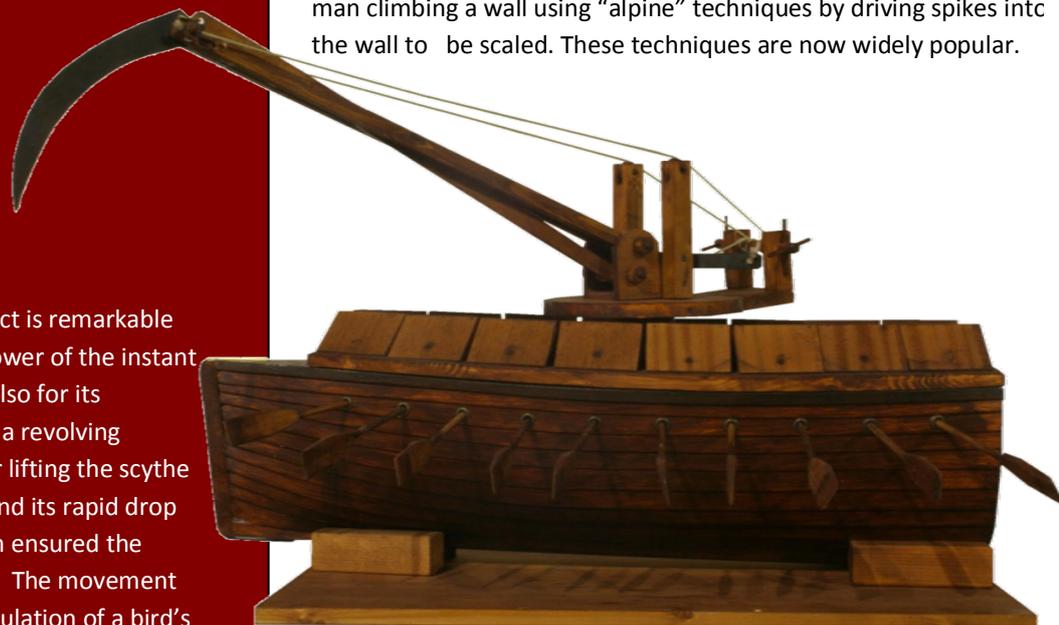


The Escorpio (Scorpion) project is remarkable not only for the aggressive power of the instant drop of the large scythe but also for its manoeuvrability by means of a revolving platform. The mechanism for lifting the scythe worked by crank and gears, and its rapid drop together with this mechanism ensured the effectiveness of the machine. The movement of the scythe mimics the articulation of a bird's wing – showing that Leonardo was once again a pathfinder for the new science: BIOMIMETICS



Above: Assault techniques (*Tecnica D'assalto*)  
LV 45 Codice Atlantico F.59v

Leonardo invented many attack and defence systems. Here we see man climbing a wall using "alpine" techniques by driving spikes into the wall to be scaled. These techniques are now widely popular.



Above: Boat with blades 'The Scorpion' (*Barca con Falce-Escorpio*)  
LV 43 Codice Ashburnham 2037 F.8r

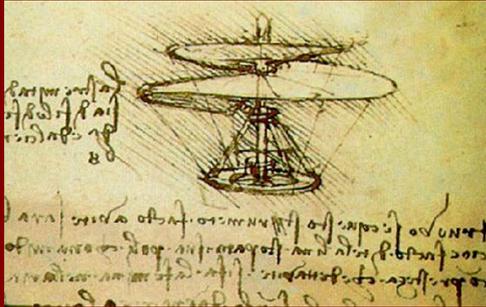
Below: Leonardo's design for an armoured vehicle made from wood and operated by eight men was made in circa 1487. The 'tank' was operated by turning the cranks. The solution of making this tank 'operational' was only achieved by the uncovering of a 'hidden mechanism'.



Above: Tank (*Carro Armato*) British Museum F.1030

## FLYING MACHINES – Theme 3

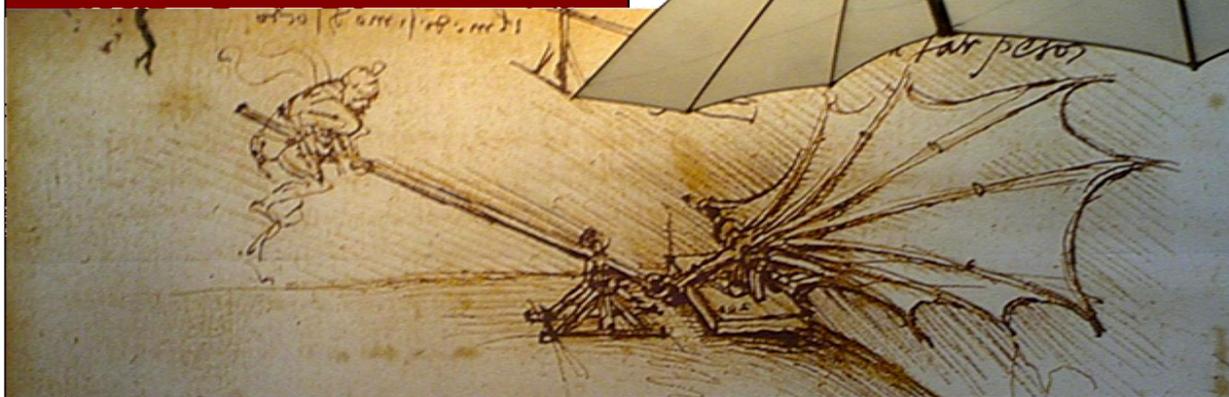
From his childhood days, roaming the hillsides of Tuscany, Leonardo was thoroughly mesmerised by birds. He dreamed of man being able to fly. Later, he filled notebooks with sketches and studies that focused on the way wings move – their curve, their strength and their flexibility. He studied how creatures of flight become and stay airborne, noting how wings interact with air currents, demonstrating an unprecedented knowledge of aerodynamics.



Based on his observations of birds in flight, Leonardo designed many man-powered flying machines.



In the image below, Leonardo has based the wings on those of a bat. He usually substituted wood for bone, leather for muscle and cloth for skin, and constructed an elaborate system of hinges, ropes and pulleys which enabled the pilot to operate the wings with his feet, as detailed in the image above.



Left and Above: Air screw (Vite aerea) LV Manuscript B F.83v

The drawing on the left is certainly one of Leonardo's most famous designs since in it one recognises an ancestor of the helicopter. This craft made of reeds, linen, and iron thread would have been operated by four men who, by rotating a shaft, could lift themselves off the ground.

It is clear that the mechanism so conceived could never have taken off, but the idea remains that with an adequate force the machine could actually have spun itself into the air and surely enough, Leonardo had hidden such mechanism into his drawing.



Above: Vertical Ornithopter 'Vertical Flying Machine' operated by one man Codice Atlantico F.824v

# NAUTICAL AND HYDRAULIC – Theme 4

The drawing of the breathing apparatus on the right is one of Leonardo's most famous ideas to aid humans to remain underwater, no doubt based on his anatomical studies on the behaviour of fluids in the lungs and the heart.

Leonardo had realized that the ancient apparatus of a single breathing tube was inadequate, if not deadly, since it did not allow for an effective air replacement; in the long run, the expired air would only stagnate in the pipe, obstructing the incoming fresh air. To function, the apparatus must then channel fresh air and stale air separately. For this Leonardo adopts two tubes, each fitted with a valve that regulates the opening and closing. The two valves are operated by breathing and work alternately: when one opens the other closes. In this way, by inhaling, fresh air flows in the first tube, while exhaling, stale air is pushed in the second and drained to the outside.

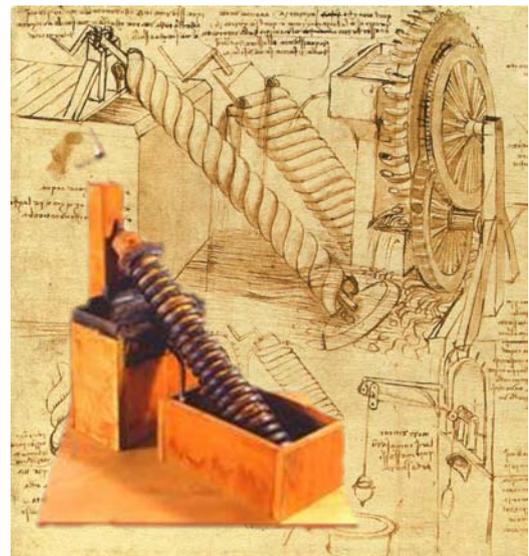


Above: Diver (Palombaro) LV 55 Codex Arundel F.24v



Above: Arched bridge (Ponte Arcuato) LV38 Codice Atlantico F.22r

Above is a model after one of the 'light and strong bridges' Leonardo designed and promised in a letter to the Duke of Milan. To be made of materials easy to find such as small logs and easy to carry, it was assembled by interlocking the logs without ropes or tools. It was strong enough to support the weight of a number of people and allowed for rapid and unexpected 'troop deployment'.



Above: Archimedes' screw (Vite de' Archimede)  
LV 02 Codex Atlantico F.26v



Above: Movable bridge (Ponte Mobile)  
LV26 Codex Atlantico F.855r



Above: Paddle boat (Barca a Pale)  
LV 25 Manoscritto B.F.83r

# PRINCIPLES OF MECHANICS – Theme 5

Throughout his life, Leonardo da Vinci was an inventive builder who thoroughly understood the principles of mechanics of his time and largely contributed in many ways to advancing them.

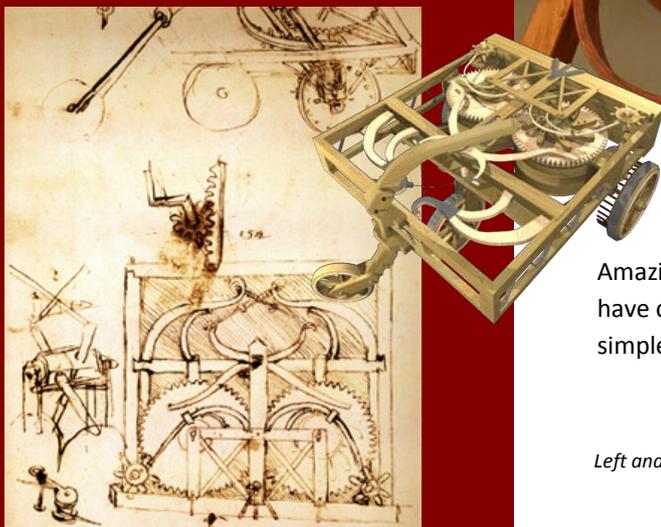
According to Leonardo's observations, the study of mechanics, with which he was quite familiar as an architect and engineer, also reflected the workings of nature.



Left: Bicycle (Bicicletta) LV 31 Codice Atlanticus F.133v

Right: This is one of the most famous Leonardo's inventions. It is a self moving car propelled by a complicated mechanism powered by leaf springs (balestre). The car system suggests that an operator would have to hand-load the leaf springs.

The stored energy is transmitted to the driving wheels by means of a complex set of gears. He also incorporated a small rudder-wheel to steer the car.



Above: Corkscrew mechanism (Meccanismo Elicoidale)  
LV 07 Codex Madrid I F.17v

Leonardo's machines often require the transformation of motion from one plane into another using a "universal screw" – a mechanism often employed by Leonardo because it spread frictional resistant forces over the many grooves providing extra safety for its users – a concept quite revolutionary for the time.

Left: This is one of the many mysteries still surrounding Leonardo's life and work. During restoration of the Codex Atlanticus, this drawing was found between two glued in pages. The lack of detail in the drawing and the signature of Leonardo's pupil, Salai, lead us to think that the drawing is not by Leonardo, but by his pupil, who may have copied the bicycle from a model seen in his master's workshop.



Amazingly, recent mechanical details and historical facts have come to light making the operation of the car much simpler and more plausible.

Left and above: Car powered by springs (Macchina a balestre)  
LV 12 Codice Atlanticus F.812r

## ARTWORK (Reproductions) - Theme 6

As a child Leonardo da Vinci showed precocious genius in math, music and art.

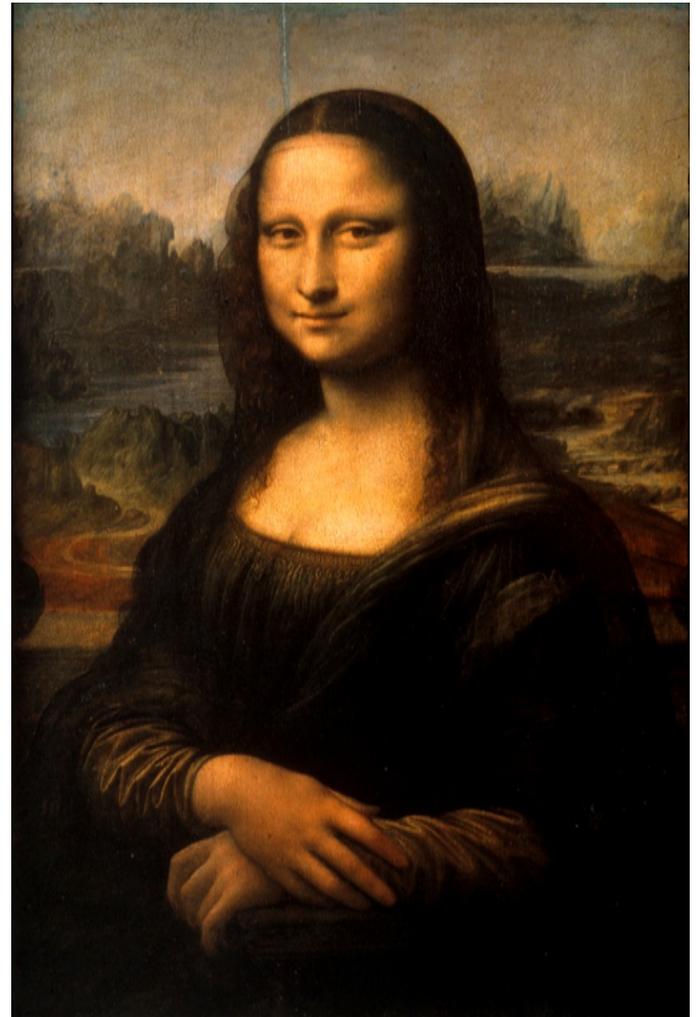
His greatest desire was to be apprenticed to a painter, a profession which was looked down upon at the time.

Eventually, his father was worn down by the boy's undeniable talent, and took him to Florence to study painting, sculpting and engineering under the great Andrea del Verrocchio.

Leonardo quickly outstripped his master (though he continued to study with Verrocchio until around 1476) and was admitted to the Florence painters' guild in 1472.

Only 15 paintings directly attributed to Leonardo da Vinci survive. There are others that remain contentious, or those that are actually lost.

The known masterpieces of Leonardo da Vinci have been reproduced for this Exhibition, including the most famous and most valued of all, the Mona Lisa. The Exhibition reveals the findings of recent scientific research including x-ray analyses, adding to the mystic of the painting that each year, six million people visit the Louvre in Paris, to view.



Portrait of Lisa del Giocondo (Mona Lisa) oil on poplar 77 x 53cm c. 1503-



Virgin and Child with  
St Anne c. 1502-1513



Portrait of a Musician  
c. 1485



The Virgin of the Rocks  
c. 1495-1499/1506-1508



Portrait of Cecilia  
Gallerani c. 1489-90



Annunciation c. 1473-1475(?)



The Last Supper c. 1495-1497

# EDUCATION PROGRAM

The world class, **DA VINCI MACHINES EXHIBITION**, in collaboration with the Leonardo Da Vinci Museum in Florence, explores how through the power of observation and experimentation Leonardo da Vinci made extraordinary advances in every discipline in which he worked: he was an inventor, mathematician, artist, anatomist, scientist, architect, engineer and musician.

The exhibition demonstrates Leonardo's approach and understanding of the basic physical principles behind everything that happens. It provides Schools and Teachers with the opportunity to bring the Italian Renaissance, art, lifestyle, culture, science and history into the classroom.



## DA VINCI MACHINES EXHIBITION

Website for updates and contact details  
[www.romanmachines.com/davincimachines](http://www.romanmachines.com/davincimachines)

Presenting in excess of 60 interactive machines based on the original da Vinci drawings. Featuring his amazing flying machines, nautical and hydraulic inventions, architectural innovations, groundbreaking applications of civil engineering and incredible war machines. There 15 reproductions of his most famous artworks including *The Mona Lisa*, giant art panels, computer animations, film screenings and rare copies of the Leonardo da Vinci Codices

Providing a variety of subjects for teachers to integrate into classroom programs, such as science, physics, engineering, history, mechanics, mathematics, culture and art.

## TEACHER RESOURCES

Education Resources which include ideas and formats for experimenting and integrating the Exhibition themes and content into classroom programs are available, providing a valuable teaching tool for all schools bookings excursions.

Suitable for all school levels through to University, offering the potential for students to achieve a number of Outcomes in their own state's Curriculum and Assessment Framework - Primary, Secondary and Tertiary Studies.

### Primary Levels:

Art (Exploring and responding), History (Historical knowledge and understandings, Historical reasoning and interpretation), Design, Creativity and Technology (Analysing and evaluating), LOTE (Intercultural knowledge and language awareness), Science (Science knowledge and understanding, Science at work) Thinking Processes (Inquiry, Reflection, Evaluation).

### Secondary Levels:

Art (Exploring and responding), History (Historical knowledge and understandings, Historical reasoning and interpretation), Physics, Italian, Design, Creativity and Technology (Analysing and evaluating), LOTE (Intercultural knowledge and language awareness), Science (Science knowledge and understanding, Science at work) Thinking Processes (Inquiry, Reflection, Evaluation), Visual Communication and Design (Exploring and responding).

### Various Studies:

Art (Unit 1: Art and meaning, Unit 2: Art and culture, Unit 3: Interpreting art, Unit 4: Discussing and debating art), Physics, Design and Technology, Italian History, Systems Engineering, Studio Arts (Unit 1: Interpretation of art ideas and use of materials and techniques, Unit 2: Ideas and styles in artworks, Unit 3: Professional art practices and styles, Unit 4: Art industry contexts), Visual Communication and Design (Unit 2: Communication in context).

### Tertiary studies:

Art, Art-History, Cultural Studies, Design, Engineering, Graphic Design, History, Science, Physics, Technology and Woodcraft.



Luigi Rizzo and Gabriele Niccolai



Teknoart SRL workshop, Florence, Italy



Carlo Niccolai, Professor Carlo Pedretti, Gabriele Niccolai

**\*Carlo Pedretti Dr. Lt. 1928**

Emeritus Professor Leonardo Studies UCLA (USA).

\*Advisor to the Italian Government on matters Da Vinci. In addition, adviser to Queen Elizabeth II, British Library, King of Sweden, Bill Gates and the Niccolai family on matters Da Vinci. Author of over 40 books, recipient of Italian Government Gold Medal for Services to Culture and a Congressional Citation by United States of America Government, both awarded 1972.

## THE TEAM

In 1995 the Niccolai firm of father and sons, in co-operation with noted academics and working in close collaboration with *Professor Carlo Pedretti\**, enriched the study of Leonardo Da Vinci's mechanics by creating a series of interactive models using materials from the time such as wood, cotton, brass, iron and cord and presented each exhibit with a replica code page of the recently re-discovered Codex Madrid, from which its design was taken.

In 2001 the Italian Government recognised the high quality and skill achieved by the Niccolai family by conferring upon them the special award "Italia che Lavora" (Italy at Work).

Over the past fifteen years *Leonardo da Vinci Machines Exhibitions* have been organised in Florence, Siena, Venice, Naples, Palermo, Warsaw, Madrid, Hong Kong, Dubai, Melbourne, Sydney, Perth, Adelaide, Brisbane, Wellington, Auckland, Taipei, Vienna, Berlin, Helsinki, Chicago, Seattle, Sacramento, Huston, Detroit, Seoul and Hong Kong. All have been endorsed by scholars and have received official patronage by the hosting municipal councils and have featured in TV and documentaries and even in Hollywood movies:

- *Da Vinci: Unlocking the Genius*, Discovery HD Channel (Canada)
- *Da Vinci*, Documentary by Japanese Channel NHK
- *Bridge to Terabithia*, Walt Disney Film
- *The Bike Build*, A Living History Documentary, Beca NZ
- *Da Vinci "Anatomy To Robots"*, ABC 7.30 Report

In 2005 the Niccolai-Teknoart Group expanded with new partners, Mirko Marina (Architect) for animations, Antonio De Vito (Artist), CreaFx (Special Effects), Sara Taglilagamba (Historian) and Luigi Rizzo (Physicist for Science/Education) and undertook new projects.

In 2009-2010 the new Exhibition *Da Vinci Secrets "Anatomy to Robots"* was staged in Melbourne, Sydney and Seoul making headlines for its 15<sup>th</sup> century 'working robots' – never seen before. The discoveries are the subject of a new book titled *Leonardo da Vinci: Automations and Robotics*, CB Editions.

In 2009-2010 the new Exhibition *Machina – Technologia Dell'Antica Roma* staged at the Museo Della Civiltà Romana, Rome, was awarded the 'Gold Medal' of the President of the Italian Republic. It has also featured in TV documentaries in Italy and international magazines such as *Focus*, *Newton*, *National Geographic* and *Scientific American*.

In 2011 a new Exhibition is to be launched by Niccolai-Teknoart SNC (Firenze) Artisans of Florence Pty Ltd.

### JULIUS CAESAR EXHIBITION MILITARY GENIUS and MIGHTY MACHINES

Journey back in time, re-live history and discover the life, the culture, the determination and the genius that carved the great  
ROMAN EMPIRE 52BC – 476AD

# EXHIBITION STORYLINE

## Introduction

Movie, scenes of beautiful Florence, time-line displays and rare codices set the mood for a most amazing journey and storyline... visitors enter the period and the surrounds where Leonardo da Vinci began his working life thus helping to create the Renaissance of Mankind.

Western society was still a backward and ignorant culture when with the fall of Constantinople in 1452 - accelerating the influx of Greek scholars with their bundles of manuscripts of stored up wisdom on Greek science, philosophy and technology; the emergence of Arabic science; the philanthropy and policies of the Florentine lords - the Medici... all major influences, and the best example of multi ethnic collaboration, merged into Florence.

People of the East meeting people of the West. A convergence and exploitation of **classical knowledge with new knowledge to new problems with new solutions**. All combining with the vigor and energy of a new society and an economic climate in which ideas flourished and **the modern revolution began**.

Leonardo filled dozens of notebooks, large and small (Manuscripts & Codices) with his thoughts and drawings, recording half a century of reflections, projects and experiments across a vast spectrum of the arts, technology and science. Even though over the centuries less than one-third of these writings have survived those that have come down to us - the surviving manuscripts, provide powerful evidence of Leonardo's far-reaching activities and his bold investigations. **They form the largest and the most outstanding documentary corpus for the studying of the history of art and above all, of the science and the technology of the Renaissance.**



Navigate his many crafts, witness the inspiration he gained from sea creatures which enabled him to become the **greatest "Biomimeticist"** in the world and a **Hydraulics Machine Engineer**.

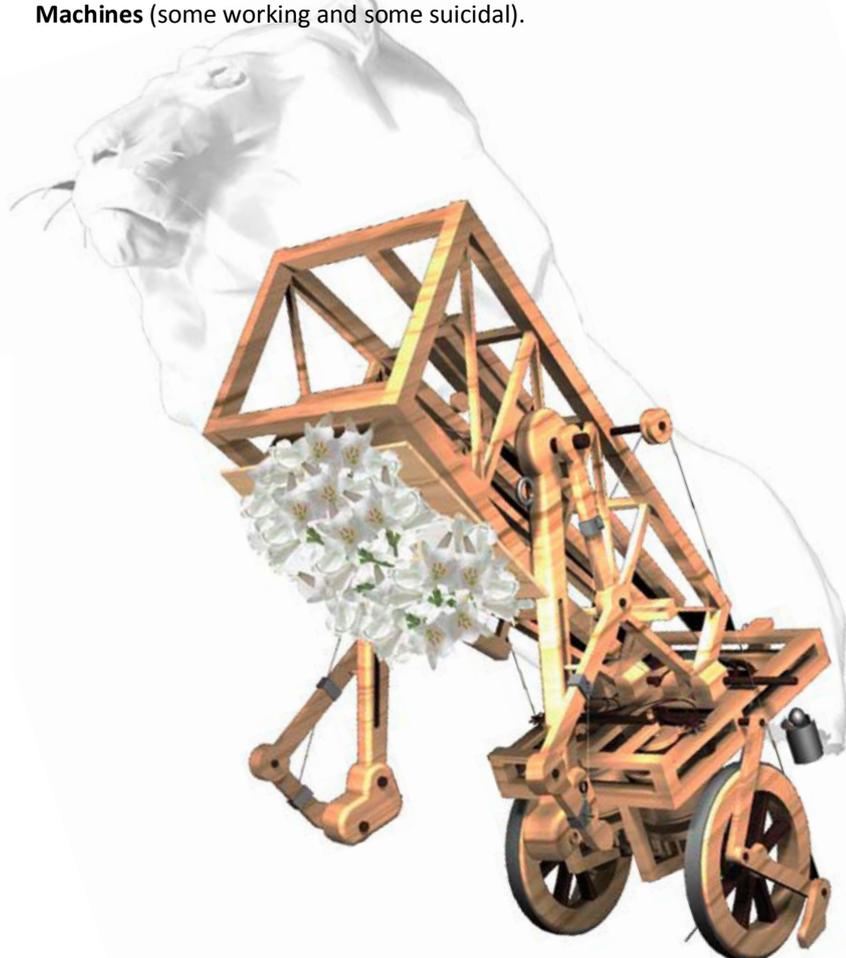
Become a physicist/engineer and operate the revolutionary **Civil Machines** Leonardo had thought of to build his Ideal City... **but above all...**

Enjoy the **Paintings and the Theatrical Machines** that Messier da Vinci, the Court Artista & Intrattenitore, actually built for the enjoyment of Dukes and Kings, and now for the fun of children and adults of all humanity.

## THUS THE VISITOR ENTERS THE INCREDIBLE WORLD OF THE GREATEST GENIUS OF ALL TIME

Leonardo's dreaming of incredible **War Machines**, which thanks to the dedicated work of the Artisans of Florence, confirmed by academics and engineers, finally can be seen in action.

Relive Leonardo's dream of giving man flight, by testing theoretically and practically the many prototypes of **Flying Machines** (some working and some suicidal).



# EXHIBITION OVERVIEW

## AIM

To review and reinterpret Leonardo's iconic inventions and his scientific foresight and compare it with the latest scientific methodology and thinking. This updated exhibition is designed to enlighten 21st century visitors of the magnitude of a 15th century man's vision, genius and achievement in our modern world of science, technology and art, and to make Leonardo's work even more relevant in today's society.

**The DA VINCI MACHINES & ROBOTICS EXHIBITION** was conceived to create an enjoyable platform upon which the vision and genius of Leonardo da Vinci could be presented to reveal the connection between his studies in Art and Nature to the wonders of Machines, not only for the present world of mechanical achievements but also pointing to futuristic scenarios.

## PLANNING EXHIBITIONS

The ongoing research, development and construction program of da Vinci Machines is an important process that has been the key in the success of the Niccolai-Teknoart SNC Group. To date, over 150 machines have been constructed from the 14,000 (approximate) drawings by Leonardo.

*Niccolai-Teknoart SNC has the technology and expertise the work with Exhibitors to fulfil specific requirements and even 'custom-make' new machines. Previous Exhibitions have included 'LIVE' demonstrations/constructions during the Exhibition with the new machine remaining onsite with the Museum and/or Sponsor.*

## THEMES

Following introductory panels on 'Florence' and important 'Time-Line Events' and a display of Leonardo's manuscripts (Codices), the Exhibition is presented in five Themes:

<b>Theme 1</b>	<b>Robotics</b>
<b>Theme 2</b>	<b>War Machines</b>
<b>Theme 3</b>	<b>Flying Machines</b>
<b>Theme 4</b>	<b>Nautical &amp; Hydraulic</b>
<b>Theme 5</b>	<b>Principles of Mechanics</b>
<b>Theme 6</b>	<b>Artwork (Reproductions)</b>

**KEY FEATURES** – in excess of 60 Exhibits (Presented below is the 'basic package' which can be extended or reduced to suit requirements and budgets of venues).

<b>Robotics</b>	Long thought to have been lost to humanity, The Artisans of Florence have reconstructed many of Leonardo's lost robots including his legendary Robot Drummer
<b>War Machines</b>	War machines and weapons based on drawings sketched by Leonardo primarily to impress his lord and master Duke Ludovico il Moro, best viewed in conjunction with the 3D animations
<b>Flying Machines</b>	Working models recreated in the Florentine workshops of the NICCOLAI-TEKNOART™ using only materials of the time and adhering meticulously to Leonardo's notes and drawings, showing how he developed his many prototypes from fantasy to successful flying machines
<b>Nautical &amp; Hydraulic Machines</b>	Machines by Leonardo to tame and utilize water as a source of energy, as a means of navigation and as inspiration to many inventions. (The process scientists now call Biomimetics')
<b>Principles of Mechanics</b>	<u>Interactive</u> machines included are studies of cranes and mechanical devices to reduce frictional forces, to enhance mechanical advantage and to improve safety for users and examples of optical applications and other general scientific considerations

## EXHIBITION OVERVIEW

<b>60 Stands</b>	To hold informative label for each exhibit
<b>40 Virtual Animations</b>	3D animations divided into 4 themes and suitable for touch-screen, demonstrating how each machine works
<b>3 Rare Copies of Codices</b>	Valuable, leather bound manuscripts
<b>1 Showcase</b>	Codice display
<b>1 DVD</b>	'Leonardo da Vinci Genius' 55 minute movie with screening permission
<b>Bases and Plinths</b>	Every exhibit, except those 'free-standing', come supplied with own base

### ACCESSORIES (Optional)

<b>10 Wall Dividers</b>	Panel dividers built by the Teknoart artisans using the same material used in Leonardo's days – designed to highlight the machines
<b>4 Large Theme Headers</b>	Carved in timber
<b>4 Video Players</b>	To screen computer animations
<b>2 Showcases</b>	Glass showcases specifically designed to display models and codices
<b>60 Labels</b>	A4 printed colour label for display and/or digital file for thematic wall text (English only)
<b>1 DVD</b>	Promotional video of artisans at work constructing the 'Da Vinci Bike'

### MERCHANDISE

<b>Gift shop items</b>	We supply 'Da Vinci' merchandise as part of the exhibition on a consignment basis at no extra cost. Each Venue has full rights to choose what they want to sell and pays only the wholesale cost of items sold.
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### VISITOR HIGHLIGHTS

- Seeing Leonardo's legendary Robots for the first time after their disappearance 500 years ago!
- Witnessing the world's first helicopter, tank, scuba diver, car... and discovering Leonardo's real purpose
- To feel and touch and in most cases, operate the reconstructed machines themselves
- Discovering the connection between Leonardo's passion with nature, his technical inventions and his art
- Learning how Leonardo protected what he was inventing back in the 15<sup>th</sup> century
- The opportunity to witness in one space, under one roof, all of Leonardo da Vinci's masterpieces.
- Admire critically *Leonardo's* masterpieces and discover how details shed new light and interpretations to his work and technique - *an experience not to be missed for the 'artist at heart'*
- To look upon the *Mona Lisa*, re-presented to the public not just as she looks today in the Louvre in Paris but how Leonardo had intended

**SUITABILITY** - The exhibition is highly recommended and suitable for the general public, people of all ages and all levels of education.

# EXHIBITION LOGISTICS AND BOOKING INFORMATION

## TOUR DATES

Please enquire on availability.

## BOOKING TERM

Minimum period of three months (not including bump-in and bump-out periods). Extension of the term is negotiable.

## FLOOR SPACE

Exhibition requires approximately 400-800m2  
Exhibition requires approximately 4000-8000ft2

## SETTING UP

Set up time seven (5) days Dismantle time five (5) days Includes two (2) Teknoart Artisans with Museum assistance.

## SHIPPING

One (1) x 40' shipping container required to transport the complete Exhibition.

## SHIPPING COSTS

Fixed Inbound cost x1 Truck, outward freight and transport is included in the rental cost

## RENTAL

Rental price and payment arrangements available on request.

## CONTACT ARTISANS OF FLORENCE

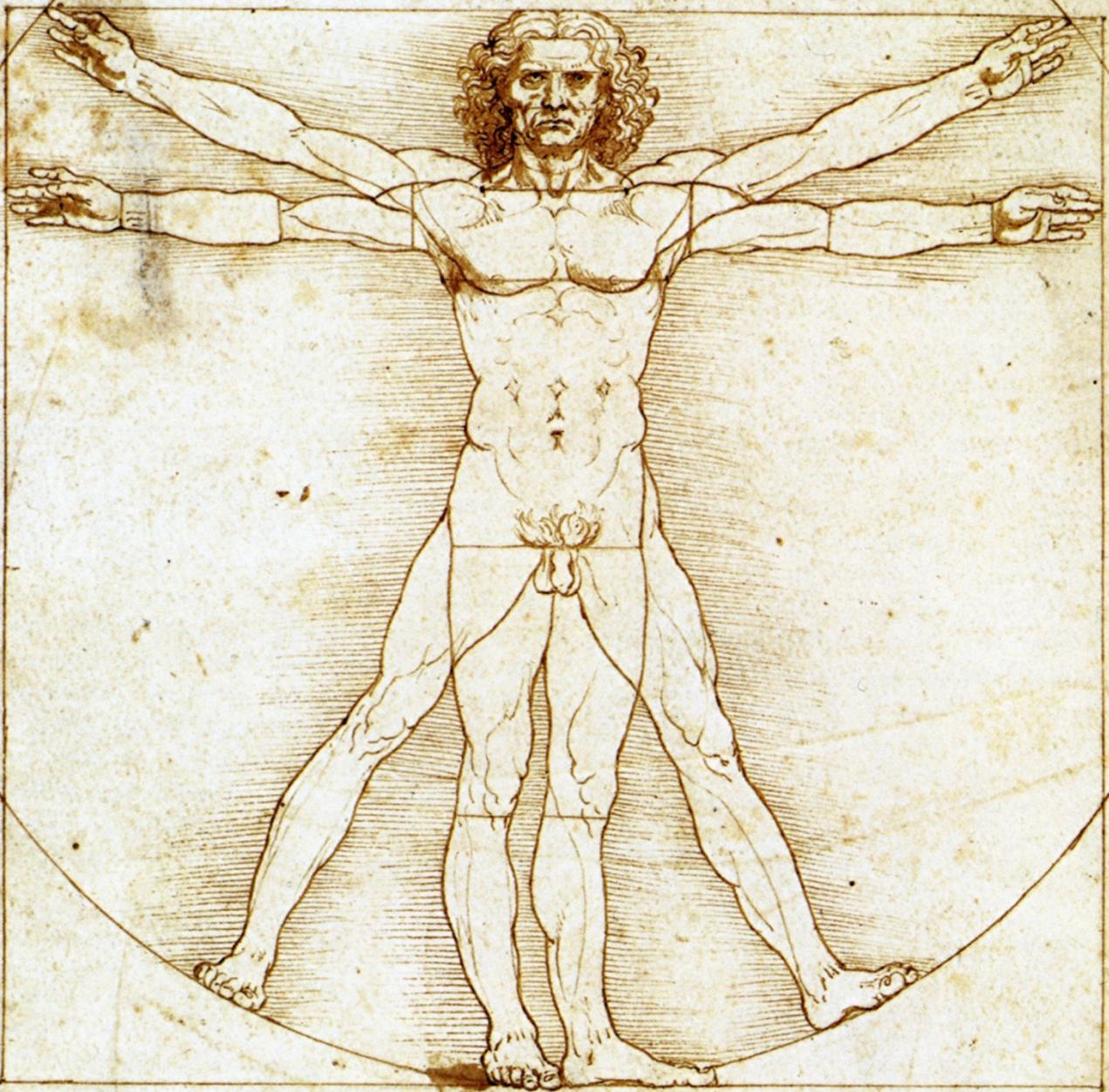
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[www.ArtisansofFlorence.com](http://www.ArtisansofFlorence.com)



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