

# **C**CRITICAL HERITAGE IN CROSS-CULTURAL PERSPECTIVES. INTERDISCIPLINARITY, INTERNATIONALIZATION AND SOCIAL MEDIA IN CULTURAL HERITAGE: SOME CASE STUDIES

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## **1. Introduction**

First of all, my greetings go to all the personalities and people present, with a special thank you to Professor Luo Weidong, Vice President of the Zhejiang University, for inviting me to this International Conference “Critical Heritage in Cross-Cultural Perspectives”, organized by this University in collaboration with Hangzhou, Urbanology Research Council and the Korea Foundation for Advanced Studies and other Institutions.

I am honoured by this invitation also with regard to the objective announced by the Organizing Committee, concerning a significantly important theme at international level and closely related to my field of interest “Art and history, culture, heritage”. My greetings also include Professor Zhang Gangfeng, who during these past months has given me some good advice and suggestions from an organizational point of view.

## **2. Art and science: art is science**

The first assertion is: “art and science are two different ways of reading reality”. This concept “reading reality” is very important for us and for the study of Cultural Heritage. In fact “read” is synonymous of this path: knowledge, interpretation, evolution of art work. This sequence is carried out by historians for subjective evaluation, and by technicians for objective evaluation. These dual possibilities represent the “core and nucleus” of my Conference and, correspondently, the study of Cultural Heritage. [1-3]

### *In relation to “art”*

It is true that many ways and many means are used for artistic products, which however determine different sensations for users, when their “reading” is possible and clear, that is their conservation state is good. One of the greatest and most versatile geniuses in the history of humanity – Italian artist and many-sided personality – Leonardo da Vinci underlines:

in Italian: *“La sapienza è figliola della sperienza... E la sperienza non falla mai, sol fallano i nostri giudizi”;*

in English: *“Wisdom comes from experience... And experience never fails, only our judgments do”.*

I highlight these keywords: “Wisdom”, “experience” and “judgments”, that is experience and consequent wisdom determines judgments. This fundamental concept is at the basis of the present topic.

### *In relation to “science”:*

It is true, however, that “science”, as an extension of technology, is always in pro-

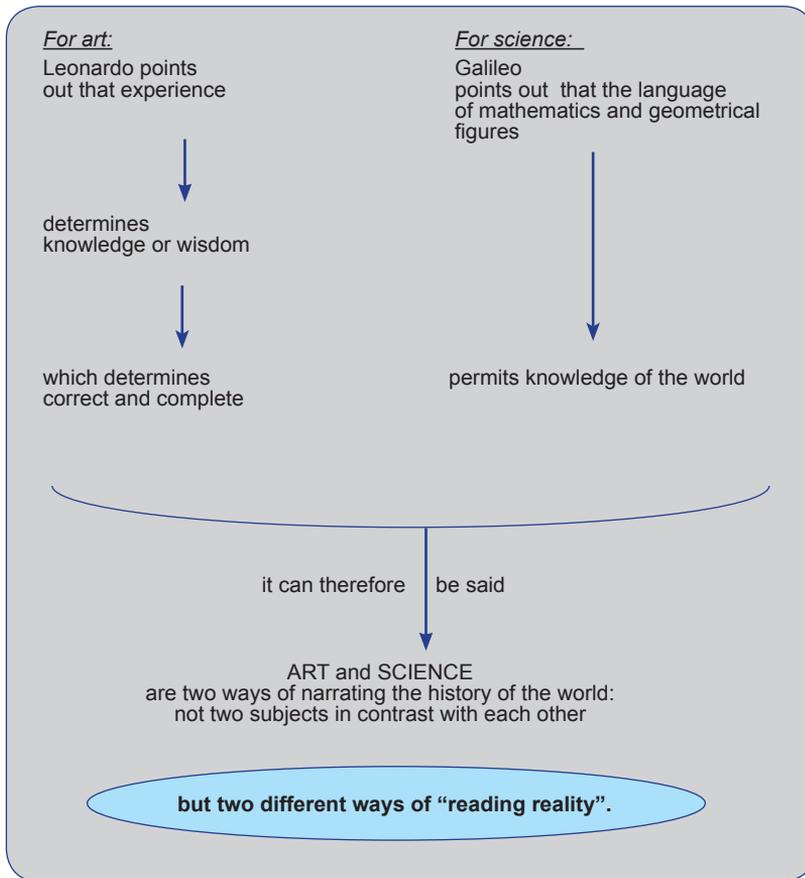
gress and causes a sense of incompleteness. Another Italian, physicist but also a versatile personality, Galileo Galilei points out:

in Italian: *“L’Universo è scritto in lingua matematica, e i caratteri sono triangolari, cerchi, ed altre figure geometriche, senza i quali è impossibile intendere”* ;

in English: *“The Universe is written in a mathematical language, where the characters are triangles, circles and other geometrical figures, without which it is impossible to understand things”*.

Again in this case, I underline these expressions: “mathematical languages”, “geometrical figures” and “understand things”, because they are fundamental to the same topic.

In relation to these concepts:



From this mutual relationship between art and science, the position and the assertion by Giulio Carlo Argan, Italian art critic, politician, academic, manager, ensues in the 80s: "All works of art are artifacts, but not all artifacts are works of art". And, in relation to the previous assertions by the geniuses Leonardo and Galileo, Argan added that the judgment of artistic value depends on the mental process and, therefore, on the method. This involves specific parameters outside the aesthetic pleasure or the emotions determined in the spectators. Judgment, on the other hand, derives from experience and, consequently, the question: "How is it possible to speak of a mental process, of method, of judgment without referring to education and, therefore, teaching and research?" "Method" from "methodology" that is "study of methods" includes the various operative steps of this path concerning the complete intervention on the work of art: history, diagnosis, restoration, conservation, prevention and, consequently, knowledge of the material typology of the art object.

### *B. Cultural heritage as economic heritage*

The art object, because it is of a material nature, involves economic aspects. But a number of immaterial values, such as previous sensations and aesthetic emotions with consequent intellectual enrichment, are undefinable and difficult to quantify in economic terms. [4] It is possible, therefore, to define the art work:

- scarce: because it is unique, not reproduced and it deteriorates;
- useful: because it satisfies the enjoyment of the individual and, at the same time, the need of culture for the community which identifies itself in the art object;
- durable: because its presence and meaning remain through time for generations and their identity;
- meritorious: because, satisfying the previous needs, it justifies public and private financial support;
- a refuge: because in this particular period of economic crisis it represents an alternative investment.

### *C. Art between price and value*

In relation to the holistic value of art work, that is composed of different aspects, now it is important to underline the economic, financial, mercantile and marketable aspects: in fact "everything in art must have a price". It is necessary to distinguish the price from the value: the price is what is paid; the value is what is obtained. The price quotes of an art object represent a big cultural calamity in the current art market. [5-6] But, in truth, the value, which derives from an art work and the consequent moments of intensity and dialogue of the user, is an important aspect not referable to a method but to an individual sensitivity and, previously, to a single artist. This phrase by William Blake is emblematic: "If the parts of perception were cleansed, everything would appear as it is, infinite". It is the artist who permits the interaction between user and art work that: is perception and sensitivity. And, in relation to the holistic value of art work, this is a set of values connected to different scientific areas:

- historical-humanistic area (cultural, historical, artistic, aesthetic);
- philological-philosophical-social area (symbolic, spiritual, social);
- technical-economic-managerial area (technical, economic, financial, mercantile, marketable);
- legal-identity making area (of identity, of authenticity, of interdisciplinarity, of internationalization).

### **3. Interdisciplinarity and internationalization in the study of cultural heritage**

#### ***Interdisciplinarity***

The study and the approach of the various and integrated scientific experiences and competences are fundamental for “the good of cultural goods”. [7-8]

In this manner the answer to the wide-ranging and complex problems related to the authenticity, protection and valorization of cultural heritage, is complete and correct. But, at the same time, interdisciplinarity is necessary for the training, teaching and education of the professional figure in this sector and for competing at a national and international level.

In the past this aim was random and fragmented, but now it must be the result of a more specific and comprehensive form of research.

#### ***Internationalization in culture and research***

The evaluation of research is both a current and difficult topic, because various theories and criteria determine various results. An emblematic example is the annual compilation of the best Universities in the world. There are various classifications from different studies of:

- Taiwan Ranking;
- QS World University Rankings;
- Times Higher Education;
- Academic Ranking of World Universities (ARWU) of the Jiao Tang University of Shanghai.

In relation to the last Institution, the American Universities (Harvard, Stanford, Berkeley) are the best, after come English Universities and then Italian Universities (Bologna is the first or among the first): there are criticisms and controversies in relation to arguable and partial criteria. In the case of Shanghai, the methodology is concerned fundamentally with scientific and not humanistic publications, with studies in English and in favouring the important academic Institutions.

In the case of the sector of Cultural heritage this evaluation is very hard and difficult, because the evaluation of the publications must necessarily be considered interdisciplinary scientific products. Consequently, there is an evaluation by technicians and another evaluation by historians, and – there is worse to come – an evaluation by a person who is not a researcher in this specific sector, even if just occasionally: this is the current and confused situation, because the specific expert is rare.

However, without doubt, the perseverance and enthusiasm of the researchers in Cultural heritage and the meaning, deriving from art work in its role of joy, contemplation, enjoyment, sadness, pathos are always present.

These qualities, not quantified and not classified, go beyond local and national confines.

#### 4. Cultural and Environmental Heritage in relation to social media

This topic includes two fundamental aspects which will be the object of discussion:

- The first is related to the importance of education and research in the “system: artifact-environment-biota”. I would like to remind you about the necessity to consider this system for the strict interrelation between artifact and environment both in external and confined areas, with the aim not only of protecting artifacts but also safeguarding human health.

- The second aspect is connected to the various means with which currently social media express their potentialities referred to cultural and environmental heritage.

In relation to the first point, these are the various operative steps of the methodological path for the protection and valorization of the “system: artifact-environment-biota”: [9]

For the protection the phases are:

- Historical anamnesis
- Diagnosis
- Interventions of restoration and/or maintenance and/or conservation
- Prevention
- Monitoring

For the valorization:

- Management
- Fruition

keeping in mind the ethical aspects.

In relation to the second aspect, that is the interrelation between the environmental and cultural heritage and ongoing change of social media, the question is: “What is the connection between “Environmental and cultural heritage and social media?”. In relation to the ethical aspects of the environment, which must be considered cultural heritage, there is currently a conflict between “nature and science”: it talks about the defence of the environment, that is “environmentalism” as an alternative to technology. On the contrary, ethical principles are fundamental for the use of technology in environmental safeguard, that is “e-environmentalism”, and for those who are subjected to the actions of technology, not for those who employ it for their own interest.

Another aspect is related to “information bulimia”, concerning the large quantity of data and consequent memorization of knowledge: the resolution is connected to the appropriate tools for understanding and transmitting this data. And this assertion can be reposed for different scientific areas:

“What is the use of hundreds of lines and links on chemistry on a page of Wikipedia, if I have to stop at the third line, because I don’t understand anything?”

From this derives the importance of clarity, restraint and correctness of the information.

## 5. Education and research

Initially, I think that the following assertion is pertinent to our life and, in particular, to cultural and environmental heritage: “Our past is part of our future through our present”.

This truth is applied in art, because the various artistic expressions, conceptions and productions are linked to each other and to the history of man. But the same truth also represents the basis for education and research conducted by me at the Department of Cultural Heritage, Alma Mater Studiorum University of Bologna, Ravenna Campus, Italy, founded in 1998.

In relation to this, the concepts and aims, connected to interdisciplinarity and internationalization, are realized with the historical and technical-experimental strategies and methods for the protection and valorization of cultural heritage.

### Education

I mention two book series directed by me:

- Book series: “Cultural Heritage and Environment”
- Book series: “Training and Research in the sector of Cultural and Environmental Heritage”

The first book series includes 11 volumes and deals with various topics concerning the various and complex problems of work of art: characterization of material typologies, evaluation of conservation state, authentication, scientific methodologies, restoration, valorization, art market: both general and specialist subjects.

The second book series includes the first volume with the interventions of experts from Universities, Organizations, Ministries, from different scientific extractions and competences, who participated in several Study Days, organized by me on training and research in the sector of Cultural and Environmental Heritage, with the aim of presenting numerous and critical aspects of the situation and condition.

The second volume, concerning the technical and legal aspects in indoor areas (Museums, Libraries, Archives, art Galleries) is in print.

In relation to my didactic and managerial activity, there is the Master in “Planning and Promotion of Artistic and Cultural Events”. The content is related to technical, legal, economic, financial, of internationalization aspects and is directed at post graduates who will represent the professional figure for the management of cultural and artistic events: in this manner demand and offer are met in the work market. Involved are: Cultural and Production Units, Ministries, Research Centers. Next year the Master will be in English, becoming international.

### Research

- The Diagnostic Laboratory for Cultural Heritage

It has been indicated as an “Institution of excellence” among public Italian Institutions and Universities by Change Performing Arts, an international company which organizes artistic and cultural events, by the Italian Ministry for Cultural Heritage and Activities and by the National Institute for Foreign Trade.

The Laboratory has various diagnostic-analytical technologies for the study and monitoring of the “system: artifact-environment-biota” for the corresponding themes

connected not only to historical anamnesis, knowledge, conservation, authenticity, virtualization, restoration, conservation, cataloguing of artistic, archeological, archival, book, musical, architectonic, monumental, demoethnoantropological artifacts, but also to monitoring and preserving the environment: the aim is the protection and valorization of artifacts and also safeguarding human life.

This slide shows the sequence of diagnostic-analytical technologies:

- for environmental monitoring, for example, to measure illumination, quantification of the dusts PM10, 25, 1, etc.

- for monitoring artifacts. The instruments are used in relation to different material typologies: documentation and cataloguing of images, morphological and mineral-petrographic analysis, qualification and quantification of degradations, chromatic alterations, determination of chemical elements, etc...

- Themes of research

I quote my research themes concerned not only with indoor and outdoor areas of collocation-conservation of art works, but also with problems of authenticity and suitability of products used for restoration, conservation, maintenance of cultural heritage:

1. Appropriate methodologies and analytical techniques for the characterization of cultural heritage;

2. Air pollution and deterioration of monuments and historical and artistic environments;

3. Micro and macroclimatic monitoring in confined spaces: Museums, Libraries, Archives

4. Art diagnostics and verification of authenticity;

5. Evaluation of the suitability of products used for restoration, conservation and maintenance of cultural heritage.

- Historical-artistic Journal “Conservation Science in Cultural Heritage”

The Journal is available in hardcopy and online. It was founded in 2001 and edited by my Department and various Italian and foreign Universities, Research Centres and Academies, among these I point out, with great pleasure, the presence of Zhejiang University and the introduction of Luo Weidong and Zhang Gangfeng as components of the Advisory Committee.

In respect of the principles and aims of internationalization and interdisciplinarity, the Journal has several international certifications and is present in various websites and platforms that is: EBSCO Publishing and Wilson Company (USA) with numerous Institutional links from all over the world.

- Historical-technical Journal “Conservation Science in Cultural Heritage” available in hardcopy and online



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Complutense University of Madrid

## 6. Case studies

The second part of my conference is dedicated to some emblematic case studies, chosen appropriately, and related to: “St. Peter’s Basilica in Rome” [3, 9] (*Figura 1*) and “Gioconda with columns” [10] (*Figura 2*).



*Figure 1. St. Peter's Basilica in Rome*



*Figure 2: Gioconda with columns*

### 6.1 “Restoration project for the façade of St. Peter’s Basilica in Rome”

On this occasion I was invited by the Italian President of the Academy of Sciences to talk about this restoration, carried out by ENI – Technologies (a large Company: National Hydrocarbon Board). The occasion was one of great significance for Christianity and for the world: the Jubilee year 2000.

The objectives of this restoration project are:

1. Study of the artifact, which includes its historical anamnesis and technical phases of restoration
2. Analysis of the environment
3. Collection and documentation of historical and technical results on a database

#### **General aspects**

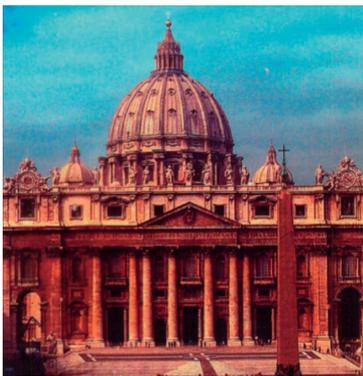
It is scientifically significant to underline the various competences involved in this project with a synthesis of archival, bibliographic and iconographic knowledge together with technical, material and environmental aspects.

It was possible in this manner to carry out the intervention of restoration with the various operative phases related to: cleaning, consolidating, filling, reconstruction of missing parts and protecting.

#### **Historical-aesthetic aspects**

On this occasion I also made some objections in relation to the colouring of the façade under the dirt, repropoused in the 1700s, that is:

- the columns and the attic are white;
- the façade is ochre (*Figures 3-4*);
- the Benediction Loggia is partly red and partly green (*Figures 5-6*).



*Figure 3. The façade and columns before the intervention: with the layer of dirt*



*Figure 4. The façade and columns after the intervention: with the various parts cleaned*

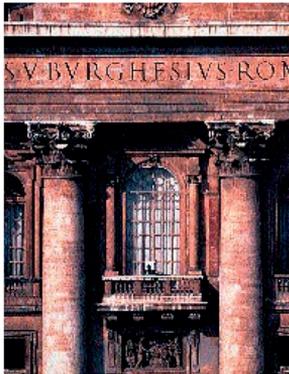


Figure 5. The Benediction Loggia before the intervention: with the layer of dirt



Figure 6. The Benediction Loggia after the intervention: with red and green colors

<p>1) <b>Before intervention:</b> Basilica with dirt and smog</p>		
<p>2) <b>After present intervention:</b> Basilica with - white: columns and attic - ochre: façade, - red and green: Benediction Loggia,</p>	1	2
<p>3) <b>After present intervention:</b> Basilica with - white: columns and attic with patina - and the remainder as in the second image</p>		3
<p>4) <b>After present intervention as in 1612:</b> Basilica with - white: columns and attic with patina - ochre: façade and Benediction Loggia</p>	4	

Figure 7. The specific parts of the Basilica with the various possibilities of colour

Objective scientific proof established these colours as those used in the 1700s, highlighting the correct intervention of “cleaning” and not “repainting”. At the same time these stratigraphic examinations have shown, under the layer of colour used in the 1700s, the colourless plaster used in 1612 by Maderno, who realized, in a very distinguished and well-balanced manner, the various shades of colouring of the whole façade, determining pictorial effects with the movement of the masses:

- White columns;
- Light ochre attic, façade and Benediction Loggia.

The consequent question is: “Why not repropose the colours used by Maderno, which would probably create a more harmonious effect?”

This in respect of two fundamental principles on the basis of correct intervention of restoration, that is: the historic instance and the aesthetic instance. But, at the same time, there is another need connected today with pollution which determines the layer of dirt and consequent problem of conservation. And, therefore, the necessity for a light layer of dirt to remain, with the purpose of protecting the façade which determines contemporarily an “ancient patina” representing the passing of time: the conservative instance. Finally I think that the result of these needs should be a meeting between baroque and present aesthetics, causing a well-balanced soft colouring (*Figure 7*).

### ***Study of the artifact***

The various steps of the methodological path employed for the restoration of the Basilica are:

Before:

- photogrammetric examination, for documentation and recording;
- diagnosis of conservation state, for stone degradation, stratification of chromatisms;
- thermography and georadar, for information on geometry and body of façade, for presence of different materials.

After:

- restoration - for cleaning with JOS technique (which consists of spraying bidistilled water delicately over the surface of the facade)
- for filling with traditional mortar (slaked lime + powdered travertine and not cement + rubber as in a previous intervention of 1985-86)
- for biocidal treatment, for biological pollution and corrosion of metal (brackets, clamps).

### ***Analysis of the environment***

For the analysis of the environment, a Mobile Laboratory was used with automatic instruments which qualified and quantified the chemical pollutants: carbon oxide, nitrogen oxides, sulfur dioxides, total suspended particulate. The Optical system with Fourier Transform Infrared Spectrometry (FTIR) was also used for the characterization of materials and study of chemical bonds.

### ***Creation of a database***

As I mentioned before, all data related to diagnostics, intervention techniques, restoration documentation and environmental monitoring are collected and processed on a database, with the aim to repropose the same methodological path over time.

### **Considerations**

In my final comments on the restoration project of the façade of St. Peter's Basilica, I underlined:

- a. the correct methodological path;
- b. the dilemma related to the colouring of the Basilica façade, that is the respect of Maderno's decision in 1612 or the successive intervention in the 1700s, which constitutes a historical, aesthetic and conservative problem;
- c. in relation to this last aspect, the absence in the sequence of analytical data of a significant parameter, that is "the index of greying or fouling", to follow the evolutionary trend of the degree of alteration-degradation of the Basilica façade.

### **6.2 "The historical-artistic and diagnostic-analytical study of the painting "Gioconda with columns"**

The reference to the art work "Mona Lisa - Gioconda", one of the best art works in the world, by Leonardo da Vinci, one of the greatest geniuses of humanity, is natural. In relation to these paintings, that is "MonaLisa-Gioconda" and "Gioconda with columns", there are three theories:

- a. the opinion of some historians is this: the painting "Mona Lisa Gioconda" by Leonardo, considered a "universal art work" deprived of the two columns to make a "pendant" for a smaller painting;
- b. but another theory is related to the addition of these columns after either by Leonardo or by other artists;
- c. again another hypothesis concerns the "Gioconda with columns" as the second painting by Leonardo or a copy.

These different possibilities, in relation to our painting "Gioconda with columns", require this question related to its attribution: "Is our painting, artistically very fine and refined, by Leonardo, or by one of his followers, or a copy of the original, or a second art work by Leonardo or a copy of the latter?"

The subjective and objective evaluation represents the aim of this case study, directed at the identification of the material components and characterization of the pictorial technique of the painting. The historian, the diagnostician, the restorer, the physicist contributed in reaching a correct and complete resolution, in respect of the fundamental criteria: interdisciplinarity. [11-12]

### **Diagnostic-analytical investigations**

The analyses are carried out on the painting in the private Museum of St. Petersburg, where it is conserved, and also on the samples taken from the artifact in the Diagnostic Laboratory for Cultural Heritage of the Department of Cultural Heritage of Bologna University (Ravenna Campus) using diagnostic-analytical technologies.

These are the investigations with the various analyses and the most important corresponding figures:

- macroscopic analysis (*Figures 8-9*);
- evaluation of conservation state (*Figures 10-11*);
- characterization of the support (*Figure 12*);
- radiocarbon dating of the support (*Figure 13*);
- characterization of the preparatory layer of the support (*Figure 14-15*);
- characterization of the binder (*Figure 16*);
- characterization of the primer of the support (*Figure 17-18*);
- identification of the pigments (*Figure 19*);
- definition of the painting technique (*Figure 20*);
- definition of the *sfumato* (*Figure 21-22*).

### Macroscopic analysis

- In figure 8, the photograph in the visible of the painting;
- In figure 9, the wooden support and the two supporting canvases of the painting



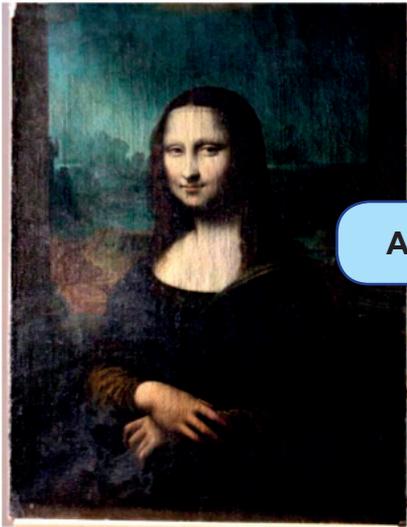
Fig. 8. Photograph in the visible



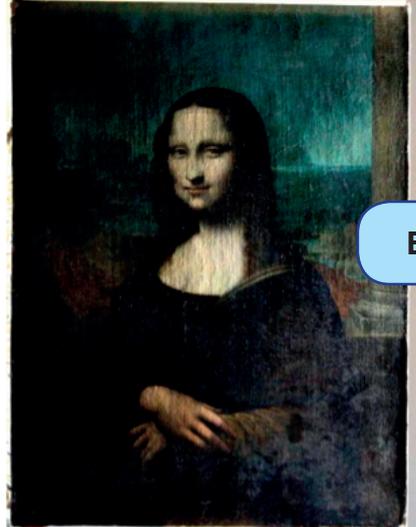
Fig. 9. Detail of support made of two canvases nailed to wooden frame

### Evaluation of conservation state

- In figure 10, the image, using *raking light*, which made the pictorial surface uneven and
- In figure 11 the different reintegrations (retouching and repainting) made over time using *ultraviolet fluorescence*.



A



B

Fig. 10. Image using raking light left (A), right (B)



Fig. 11. Image using ultraviolet fluorescence

### Characterization of the support

- In figure 12, the weave of the linen canvas using scanning electron microscopy (SEM) and its dating (figure 13) using radiocarbon.

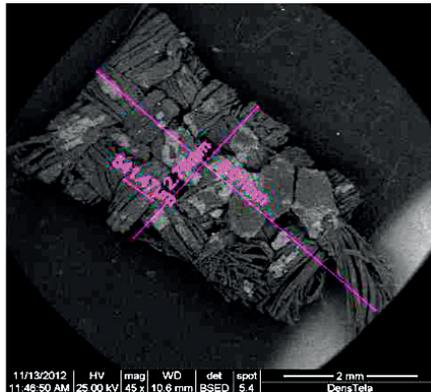


Fig. 12. Sample of canvas observed using SEM

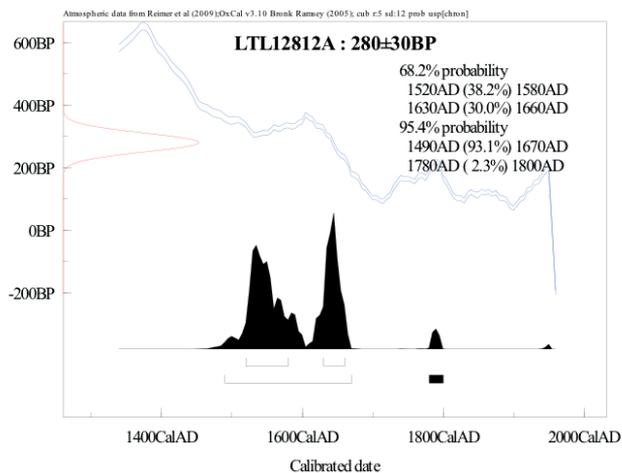


Fig. 13. Radiocarbon dating of the support

### Characterization of preparatory layer

- In figure 14, the composition of different layers using electron microscopy;
- In figure 15 the identification of chemical elements with XR Diffractometer (EDX).

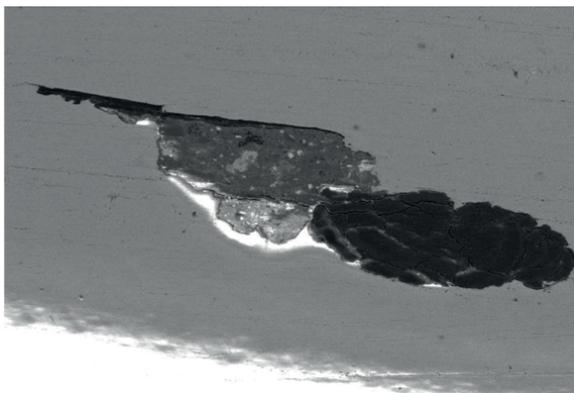


Fig. 14. Photograph using electron microscopy (250x)

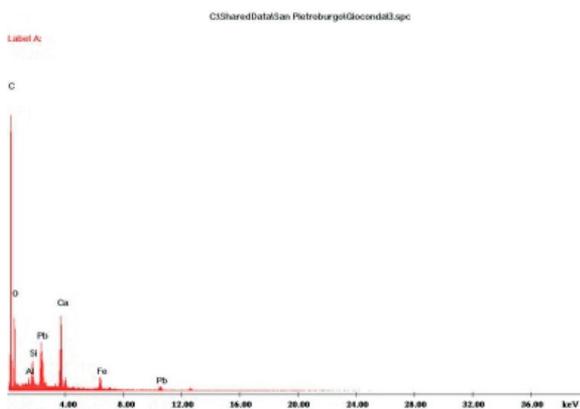


Fig. 15. EDX spectrum of red layer of preparation

### Characterization of the binder

- In figure 16, the chemical composition of the binders with Fourier Transform infrared spectrometer (FT-IR); [13]

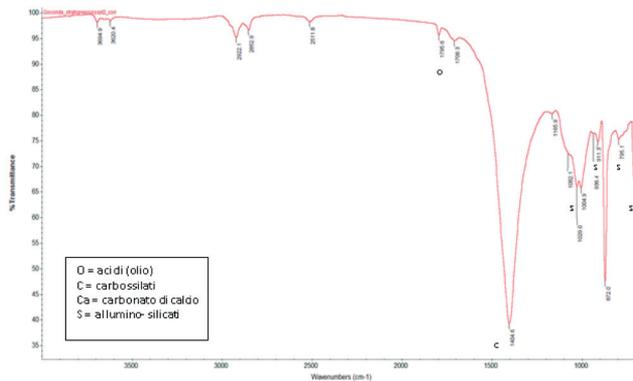


Fig. 16. FTIR spectrum of preparatory layer

### Characterization of the primer

- In figures 17 using SEM and 18 using FT-IR, the chemical composition of the primer in relation to compounds; [13]

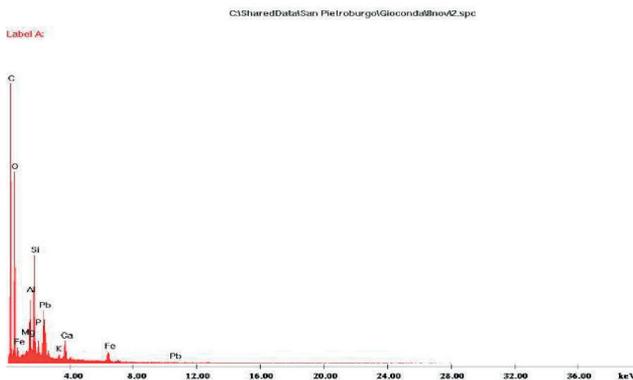


Fig. 17. Scanning electron microscopy with microanalysis: spectrum of the primer

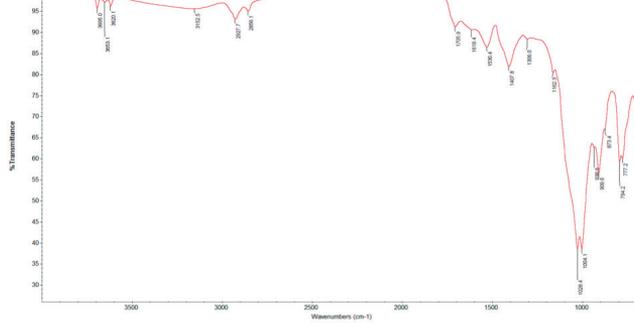


Fig. 18. Fourier Transform Infrared spectrometry: spectrum of the primer

### Characterization of the pictorial layer

- In figures 19 the identification of pigments using XRF,
- in figure 20 the definition of the painting technique in infrared spectrometry and
- in figures 21-22 the definition of sfumato through the study of colorimetric values using colorimetric spectrophotometer.

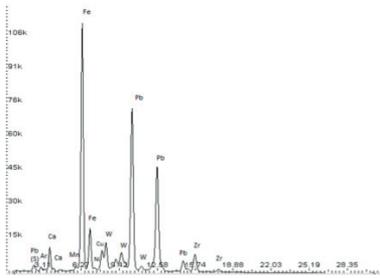


Fig. 19. Sample n. 5, dark area of neck: burnt sienna or burnt umber mixed with white lead and presence of copper to give the pigment a brown shade



Fig. 20. Detail of hands in infrared spectrometry: absence of preparatory drawing

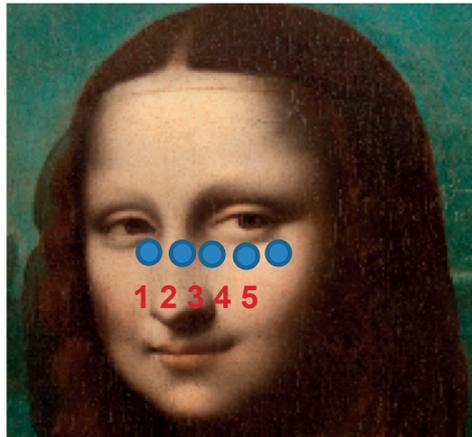


Fig. 21. Points of spectrophotometer colorimetric analysis: the brightness decreases from the lightest parts to the darkest by means of the coating of the pigments

	L	a*	b
1	54,3	7,96	22,11
2	53,15	7,60	21,17
3	50,44	7,63	17,58
4	45,77	7,02	16,8
5	30,80	3,16	7,06

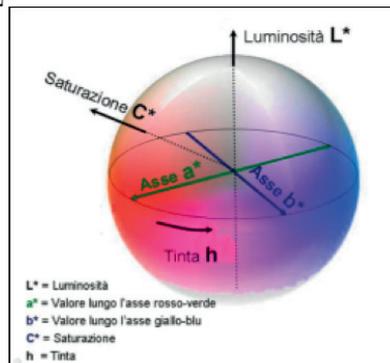


Fig. 22. Colorimetric value of the flesh tones and chromaticity diagram.

## ***Final considerations and comparison with Leonardo's "Mona Lisa – Gioconda"***

### 1. In relation to the support:

- a. in our case it is linen cloth: this kind of support spread throughout Europe from 1450;
- b. the woven texture of the linen cloth appears irregular and coarse;
- c. the size of the support is compatible with "standard" ones used from the beginning of the 1600s in the Flanders area.

On the contrary: the Louvre "Mona Lisa-Gioconda" is on wood.

### 2. The colored preparation in our case is constituted by:

- organic binder: drying oil
- white component constituted by calcium carbonate (white clay type "Spanish white");
- red-brown component: iron aluminosilicate hydrates, minium (Pb<sub>3</sub>O<sub>4</sub>) or litharge (PbO). The use of colored preparations started at the beginning of the mid-1500s

On the other hand:

- this preparation is a German-Flemish practice;
- the presence of baryte in the preparation, which permits a lesser quantity of pigment to be used with consequent economic saving, can be traced back to a period from 1620 to 1680 in the Paris area;
- Leonardo used a preparatory layer of plaster;
- the use of calcium carbonate in the preparatory layer was very rarely used in Italy until 1520-1530 and used in a limited manner later, while it was usually used in Northern Europe from the second half of the 1400s.

### 3. In relation to the primer

The colored primer above the bole preparation was used from the second half of the 1500s.

### 4. In relation to the drying oil

The presence of litharge in drying oil became widespread in Northern Europe from the end of the 1500s and later on in Italy.

### 5. In relation to the dating

The dating of the canvas support (68% between 1520 and 1660) excludes the period of Leonardo's life and work (1452-1519).

### *Conclusion*

The complete information is illustrated in Figure 23, comparing the resulting time spans with the period of Leonardo's life. [14]

### *Dating*

The painting “Gioconda with columns”, attributable to a period between 1590 and 1660, is a copy of the artifact “Mona Lisa” by Leonardo.

### *Chromatic Representation*

The very fine, elegant and expressive painting of the “Gioconda with columns” however lacks the full color of Leonardo’s landscapes: in the painting under examination there is, therefore, an evident chromatic representation quite different to Leonardo’s usual representation. Another distinctive element is the modest design.

### *Technical Execution*

A further specification is related to the technical execution, which is of Nordic derivation, in particular German-Flemish influenced by the French school: the assertion derives from the presence of baryte as an additive in the preparation. From this, the importance of the characterization of the material components, which represents the basis of the objective evaluation.

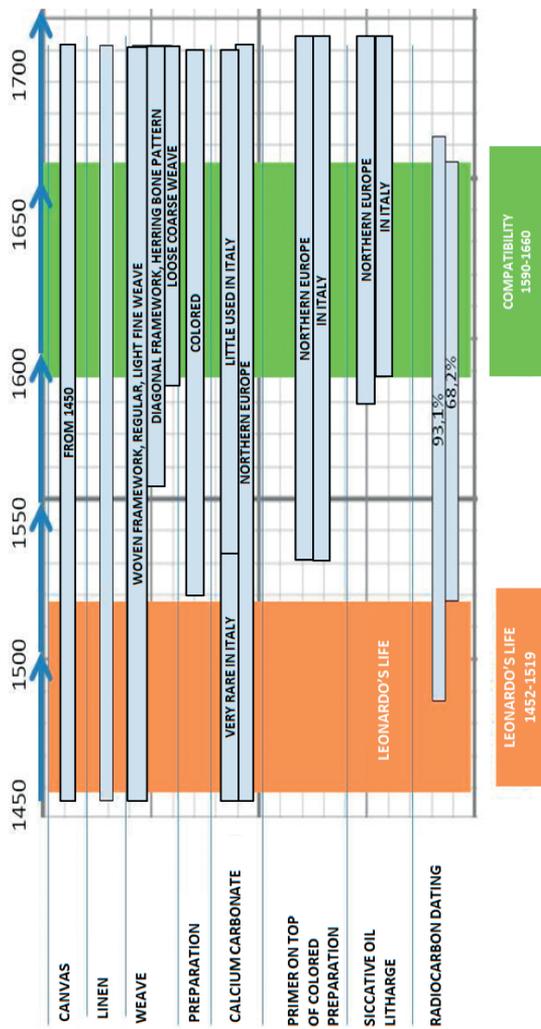


Figure. 23 Temporal collocation of the work in relation to the period of Leonardo's life (in red) and possible compatibility with the temporal findings related to the analyses performed (in green).

## 7. Conclusion

The last thought is this:

*“Beauty outside us, is beauty inside us”.*

In relation to this assertion, I report, my words in the opening of the Journal “Conservation Science in Cultural Heritage”.

*“And this is true, if it is true that:*

*Perhaps, the greatest challenge one must face up to is that of beauty.*

*Because individuality, difference, superiority, excellence is beautiful,*

*while everything that is standardization, number, quantity, dullness and normalization is ugly.*

*How can we have economic development with the beautiful?*

*How can we conserve the beautiful, which the past has left us?*

*How can we continue to create the beautiful, choose the beautiful, diffuse the beautiful and educate people to respect the beautiful?*

*I think that we can if, from the beginning, there is beauty inside us”.*

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### **Summary**

Initially the holistic value of art work and the synergy between art and science have been highlighted. The second part is dedicated to dealing with some emblematic case studies, which represent the result of historical-artistic and technical-experimental competences.

