

A preliminary analysis of Umberto Argyros' (1871-1960) painting palette via examination of the artwork 'Landscape'

Stelios Kesidis¹, Athena Georgia Alexopoulou^{2,3}, Agathi Anthoula

Kaminari³ and Nikolaos Zacharias¹



1. Introduction & objectives

- Study comprehensively examines Greek painters from the **Munich School of Fine Arts** (late 19th - early 20th centuries).
- Aims to scrutinize painting techniques, and pigment selections, focusing on linking training to academic trajectories.
- Umberto Argyros (1871-1960) stands out, influenced by Munich studies, adopting an "**academic painting style**" through interactions with esteemed artists.
- This trajectory led Argyros to become a **notable professor and director at the Athens School of Fine Arts**.
- Research centers on Argyros' key work, 'Landscape' (Fig. 1).
- Analysis of pigments aims to expose influences on Argyros' artistic progression.
- Goal: Offer insights into **materials, techniques, and artistic development**, shedding light on Argyros' academic journey and Greece's dynamic art scene in the late 19th - early 20th centuries.

2. Materials & Methods

- Subject of analysis: "**Landscape**" by Umberto Argyros (Fig. 1), exhibited at the Gallery of Contemporary Greek Art, Kalamata, Greece.
- The artwork typifies early 20th-century Greek art influenced by **German Impressionism**, preserving contours while intensifying Greek light and color.
- Investigation extensively utilized portable **Raman spectroscopy** (Bruker Bravo) for thorough identification of the artist's palette, encompassing organic and inorganic pigments and their respective chromatic compositions.
- Portable **X-ray fluorescence spectroscopy** (Bruker Tracer 5) was engaged to procure supplementary pigment data.
- **Hyperspectral, UV-induced fluorescence, and false-color imaging** (MuSIS™ HS) methodologies were implemented to delve into the internal paint layers, validate the existence of an underpainting, and visualize the chemical dispersion of pigments.



Figure 1. "Landscape" by Umberto Argyros in visible light, with spots of XRF and Raman analysis.

3. Painting Technique & Pigment Palette

- Argyros opted for **cardboard** as the painting base, accompanied by a **detailed black underdrawing** for intricate elements (Fig. 3 red arrows).
- **Hyperspectral imaging** revealed a hidden house, depicted in an **advanced stage** prior to being covered (Fig. 3 rectangle).
- **UVF** exposed distinct fluorescence in the **covered area**, linked to **lead white** application.
- Intense **blue-white fluorescence** in UVF, combined with **Raman and XRF identification**, indicated **titanated lithopone** presence in exposed regions.
- Limited **reflectance in areas** like the **bottom right** implied a subtle **titanated lithopone base** (Fig. 1 left).
- **UVF and FCIR** aided pigment localization; **cadmium yellow's** distinct fluorescence **pinpointed** its presence in yellow meadows and tree leaves (Fig. 3 left).
- **Raman and XRF** analysis of the obscured house unveiled a **red roof** using **naphthol red AS (PR3)** pigment.
- Further analysis suggested **covering with lead white and cobalt blue**.
- Pigments are applied primarily via **spatula**, supplemented by **brush in specific sections**.

Table 1. Pigments identified through Raman and XRF spectroscopies

Mars red	Hansa orange
Red read	Lead Chromate
Naphthol red AS (PR3)	Titanated lithopone
Naphthol red AS (PR170)	Lead white
Prussian blue	Chalk
French ultramarine blue	Phthalocyanine green (PG7)
Cobalt blue	Bone black
Cadmium yellow	



Figure 3. The painting 'Landscape' by Umberto Argyros. **1:** UVF photography, **2:** visible light photography, **3:** Infrared reflectogram at 940nm, **4:** False color infrared photography. The red arrows show a substrate-exposed area where the subtle layer of preparation layer and part of the extensive underdrawing can be seen. The rectangle shows where the hidden house was before it was covered. (photos by ARTICON Lab, A.A.Kaminari and St. Kesidis)

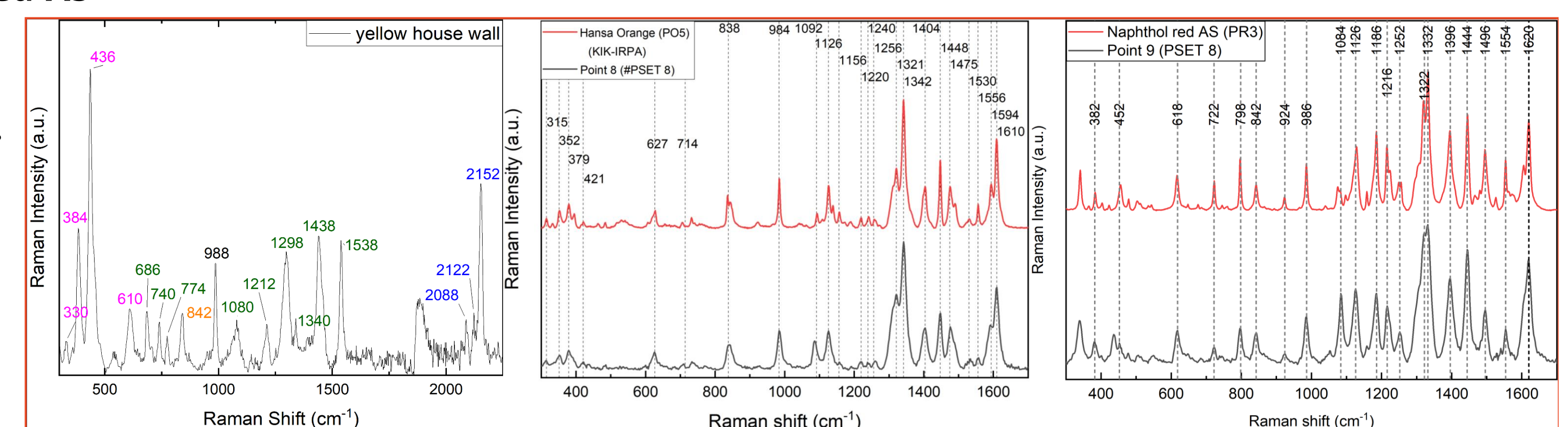


Figure 2. The painting 'Landscape' by Umberto Argyros. **Left:** Raman spectrum from the yellow wall of the dwelling. Magenta= titanated lithopone, green= phthalocyanine green, orange= lead chromate, blue= Prussian blue, **center:** Raman spectrum from the orange roof of the smaller dwelling with the reference spectrum of Hansa orange (KIK-IRPA). **Right:** Raman spectrum from the red roof of the hidden dwelling with the reference spectrum of naphthol red AS (PR3) (KIK-IRPA)

4. Conclusions

- **Argyros' painting** highlights extensive **underdrawing** adhering to **academic precision**, while his **vivid palette** departs influenced by **Impressionist and Expressionist movements**.
- The **detailed underdrawing** suggests **studio** execution over **en plein air**.
- Argyros' palette mainly features **primary colors** with the **exception of phthalocyanine green**, implying grasp of **contemporary color theories**.
- The chosen palette includes pigments prevalent among academic painters, like **Prussian blue, lead red, and bone black**, possibly aligning with **Munich Academy principles**.
- Argyros employs several pigments within each **color category** to achieve desired hues, reflecting a **shift in artistic practice**.
- Presence of **synthetic organic pigments** indicates interaction with **new market-introduced pigments**.
- Identification of **titanated lithopone** dates the painting **post-1950s**, aligning with the choice of pigments.
- Analysis of 'Landscape' by Argyros **enriches understanding** of his **technique, palette, and Greek art** during the **late 19th and early 20th century**. The study **underscores his adherence to and deviation from academic norms**, illuminating **his artistic approach**.

Laboratory
Archaeometry



ARTICON LAB
UNIVERSITY OF WEST ATTICA

ACKNOWLEDGEMENTS

This project was implemented within the scope of the "Exceptional Laboratory Practices in Cultural Heritage: Upgrading Infrastructure and Extending Research Perspectives of the Laboratory of Archaeometry", a co-financed by Greece and the European Union project under the auspices of the program "Competitiveness, Entrepreneurship and Innovation" NSRF 2014-2020.

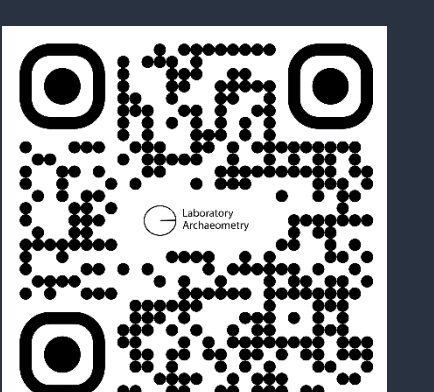


REFERENCES

1. M. Papanikolaou, *Greek Art of the 20th century - Painting - Sculpture*, Baniias, 2006 (in Greek).
2. N. Eastaugh, V. Walsh, T. Chaplin, R. Siddall, *The Pigment Compendium A Dictionary of Historical Pigments*, Elsevier, 2004
3. Gettens, R. J. & Stout, G. L., 1942. *Painting Materials - A Short Encyclopaedia*. New York: Dover Publications.
4. Scherrer, Nadim C., et al. "Synthetic Organic Pigments of the 20th and 21st Century Relevant to Artist's Paints: Raman Spectra Reference Collection." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, vol. 73, no. 3. Aug. 2009, pp. 505-524, <https://doi.org/10.1016/j.saa.2008.11.029>.

AFFILIATIONS

1. Department of History, Archaeology and Cultural Resources Management, University of the Peloponnese, 24100 Kalamata, Greece.
2. Department of Conservation of Antiquities and Works of Art, University of West Attica, Greece.
3. Laboratory of Conservation - Promotion of Visual Arts, Books and Archival Material (ARTICON Lab), School of Applied Arts and Culture, University of West Attica, Greece.



Stelios Kesidis

s.kesidis@go.uop.gr