

Hidden colours of Albania: Fresco pigments study from an isolated church in Leshnicë, 18th–19th century

In the 18th and 19th centuries, fresco painting in the Balkans evolved under the influence of political shifts, religious continuity, and cultural exchange. Despite Ottoman rule, Orthodox Christian traditions remained strong, blending with local and folk elements to create a unique artistic language. These frescoes became not only religious symbols but also quiet affirmations of cultural identity and resilience, foreshadowing the region's modern art movements. Artists primarily used natural pigments like lead white, calcite, and ochre due to their availability and durability, while rare pigments such as azurite and lapis lazuli appeared only occasionally. Although synthetic colors like Prussian blue and chrome yellow spread across Europe in the 19th century, their use in the Balkans remained limited, reflecting regional preferences and the enduring legacy of Byzantine art.

The frescoes in the Monastery of the Presentation of Christ (Ipapandia) in Leshnicë e Sipërme were analyzed in situ using portable μ -XRF across 34 points, revealing that different painters likely worked at different times. The church pigments show distinct elemental profiles tied to their colors, with Fe-rich ochers and Cu-containing greens being most common. Elevated levels of Pb, Hg, and Sb suggest the use of hazardous minerals such as cinnabar, stibnite, or minium, possibly indicating regional practices or environmental contamination. The high antimony content in red and black pigments points to the deliberate use of Sb-rich materials. Overall, the results reveal complex pigment mixtures shaped by local sources and historical techniques.

Primary author: Prof. ÇAKAJ, Olta (Department of Physics, Faculty of Natural Sciences, University of Tirana)

Co-authors: Dr GJEÇI, Eranda (Department of Physics, Faculty of Natural Sciences, University of Tirana); Ms ZAIMI, Eleni (Department of Physics, Faculty of Natural Sciences, University of Tirana); Mr FIRANJ, Ramadan (Department of Analytical Instrumental Methods, Institute of Applied Nuclear Physics, University of Tirana); Prof. YLLI, Fatos (Department of Analytical Instrumental Methods, Institute of Applied Nuclear Physics, University of Tirana); Mr VOKOPOLA, Gentian (The National Institute of Cultural Heritage, Ministry of Economy, Culture and Innovation, Albania); Dr XHAFERRI, Era (The National Institute of Cultural Heritage, Ministry of Economy, Culture and Innovation, Albania); Mrs NESTURI, Enkelejda (The National Institute of Cultural Heritage, Ministry of Economy, Culture and Innovation, Albania)

Presenter: Prof. ÇAKAJ, Olta (Department of Physics, Faculty of Natural Sciences, University of Tirana)