

# Does your Thanjavur have fake gold?

Now there is an easy way to tell without taking it apart — Raman spectroscopy

R. PRASAD  
CHENNAI

People have long known that not every Thanjavur painting that glitters is gold. There was, however, no way to find out if the gold foil and gemstones used in these traditional crafts were authentic or fake - not without ruining the painting. Now there is: Raman spectroscopy.

The gold foil used liberally in Thanjavur paintings serves two objectives: the glitter makes the painting more attractive, and it also prolongs the life of the artefact. Foils made of fake material look similar to genuine gold, making it difficult for consumers to tell the difference.

Ramanathan Venkatnarayan from the Department of Chemistry



**Real glitter:** Using gold foil adds to the life of a painting. ■ R.M. RAJARATHINAM

at the Indian Institute of Technology (BHU) Varanasi, and his team of researchers from SASTRA University, Thanjavur, Tamil Nadu have found a solution that uses Raman spectroscopy to tell whether the foil used in the paintings is made of gold or some other cheaper material.

The researchers tested ten 'gold foils' and found only three to be genuine. In the case of paintings, only one or two out of ten turned out to be genuine gold foil. The gold foils and paintings (most of them made recently) used in the study were sourced from artisans from in and around Thanjavur.

**Art with GI tag**  
Thanjavur paintings have Geographical Indication tags, which puts a premium on their authenticity, but there are no regulations governing the quality or authenticity.

The researchers validated their detection of fake gold by carrying out an energy dispersive X-ray analysis (EDX) of the paintings, which confirmed the Raman

spectroscopy findings. "EDX can also be used to find out if the foil is made of gold. But unlike in the case of EDX, Raman spectroscopy does not require the removal of the frame and the glass," said Dr. Venkatnarayan, the corresponding author of a paper published in the journal *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*.

Raman spectroscopy, which helps identify molecules in 'gold' foil is attractive as it is non-destructive. "We are working to find out the composition of the fake material," Dr. Venkatnarayan said.

The research paper also suggested framing of regulations for Thanjavur paintings.