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Advanced geometry of Islamic art

A study of medieval Islamic art has shown some of its geometric patterns use principles established centuries later by modern mathematicians.



Peter Lu became interested in the subject on a trip to Central Asia

Researchers in the US have found 15th Century examples that use the concept of quasicrystalline geometry.

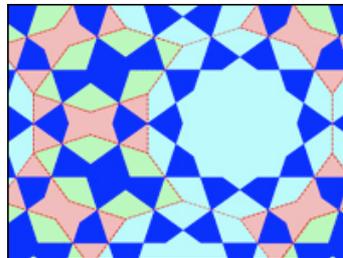
This indicates intuitive understanding of complex mathematical formulae, even if the artisans had not worked out the underlying theory, the study says.

The discovery is published in the journal Science.

The research shows an important breakthrough had occurred in Islamic mathematics and design by 1200.

"It's absolutely stunning," Harvard's Peter Lu said in an interview.

"They made tilings that reflect mathematics that were so sophisticated that we didn't figure it out until the last 20 or 30 years."



How simple shapes are used to form complex geometric patterns

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The Islamic designs echo quasicrystalline geometry in that both use symmetrical polygonal shapes to create patterns that can be extended indefinitely.

Until now, the conventional view was that the complicated star-and-polygon patterns of Islamic design were conceived as zigzagging lines drafted using straightedge rulers and compasses.

"You can go through and see the evolution of increasing geometric sophistication. So they start out with simple patterns, and they get more complex," Mr Lu added.

He became interested in the subject while travelling in Uzbekistan, where he noticed a 16th Century Islamic building with decagonal motif tiling.

Mr Lu, who designs physics experiments for the International Space Station, was in the region in order to visit a space facility in Turkmenistan.

Islamic art traditionally uses a mixture of calligraphy,

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geometric and floral designs because of a prohibition on the portrayal of the human form.

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