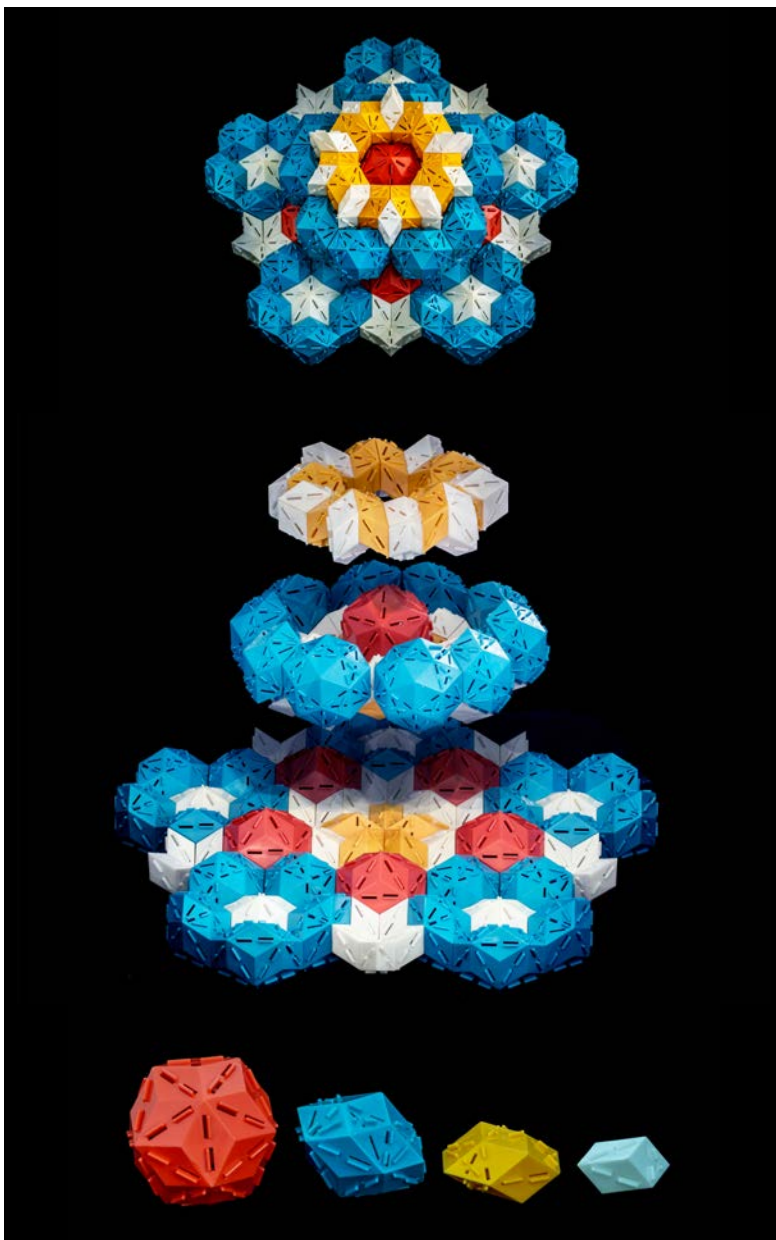


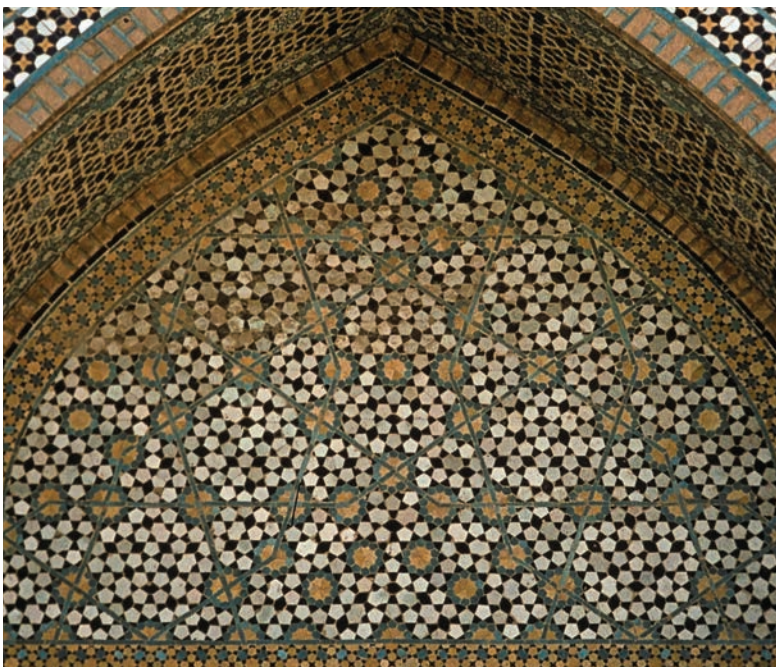
1

Quasicrystal tilings can be made with any symmetry: for example, this pattern, comprised of five different tile shapes, has eleven-fold symmetry.



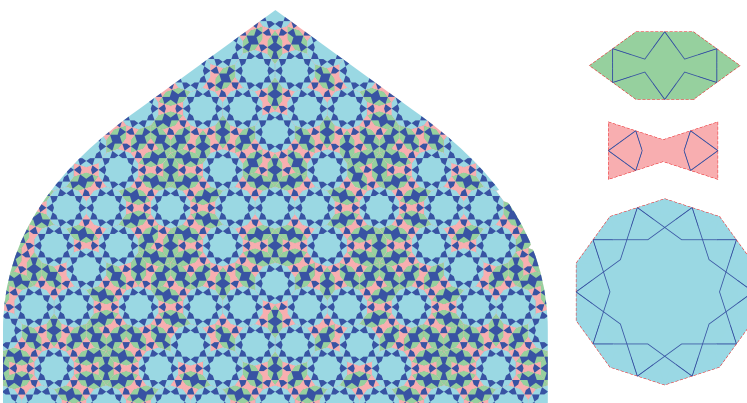
A three dimensional model (top) of an icosahedral quasicrystal built from layers (middle) composed of four different building blocks (bottom). The flanges and slots on the blocks force them to assemble in a quasicrystal arrangement.

3



The remarkable tiling on the Darb-i Imam shrine in Isfahan, Iran, (top) can be viewed as a quasicrystal tiling (bottom left) composed of three shapes known as girih tiles (bottom right).

4



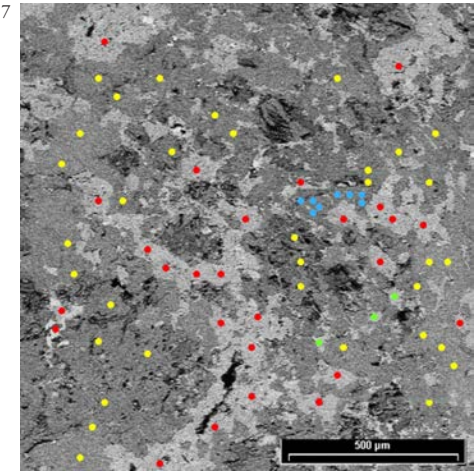
The khatyrkite sample from the Florence museum in its original box (held by putty), next to a euro coin for scale. Middle, the sample is enlarged about ten times.



5



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7

Luca Bindi's electron microprobe study of the sample, measuring its chemical composition from spot to spot. Yellow represents khatyrkite, CuAl_2 ; red is cupalite, CuAl ; green is a crystal mix of AlCuFe ; blue is the first natural quasicrystal, icosahedrite, $\text{Al}_{63}\text{Cu}_{24}\text{Fe}_{13}$.

8

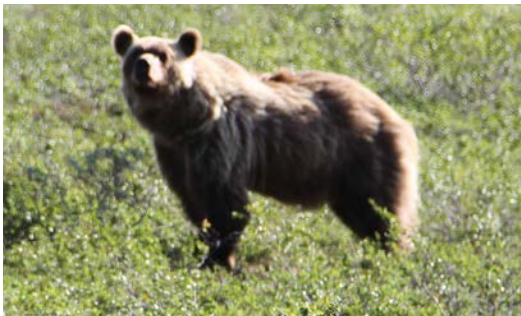


Top: The two behemoths and the expedition team (left to right): Bogdan Markovskii, Glenn Macpherson, Will Steinhardt, Chris Andronicos, Marina Yudovskaya, Luca Bindi, Viktor Komelkov, Olya Komelkova, Paul Steinhardt, Sasha Kostin, Valery Kryachko, Michael Eddy, Vadim Distler, and, in the foreground, Bucks. *Bottom:* A behemoth crash; Bucks, in close-up; and a Kamchatka bear.

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12



Top: Russian scientist Valery Kryachko in Kamchatka (with Paul Steinhardt over his left shoulder) reviews the expedition route with the team. *Middle:* Will Steinhardt along the excavation site at the Listvenitovyi Stream. *Bottom:* Luca Bindi and Paul celebrate their 2011 arrival at the spot along the stream where Valery discovered the Florence sample in 1979.

13



14





Top: Valery Kryachko pans for samples; Glenn MacPherson examines a rock for evidence of a meteor strike; Valery and Luca Bindi check grains; Chris Andronicos and Paul Steinhardt (wearing mosquito gear) map geological features. *Bottom:* The view from the campsite at midnight.



20



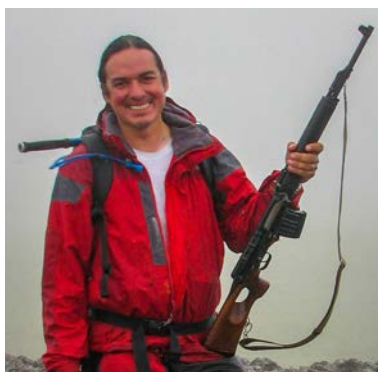
21



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Top: Marina Yudovskaya and Mike Eddy during a mapping expedition; Will Steinhardt preparing to dig at the stream; Chris Andronicos armed with a rifle to defend against bears. *Bottom:* The team celebrating its final night in the field, with Paul Steinhardt holding a flare aloft.

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