LATTICE LABYRINTH TESSELLATIONS

on the square lattice *--- to say nothing of the triangular lattice*

Intricate (but topologically simple) TILINGS OF THE PLANE

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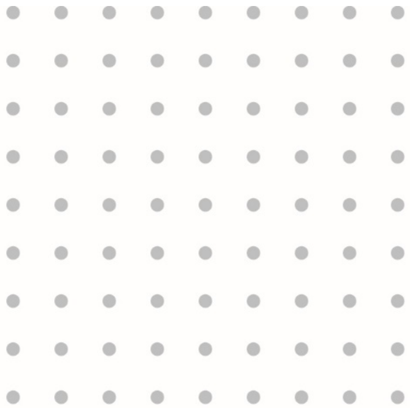
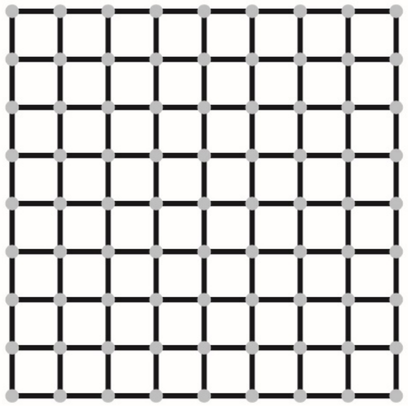
MathsJam Conference 2016

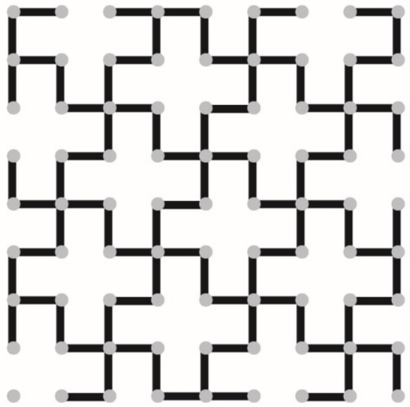
GO ! GO ! GO !



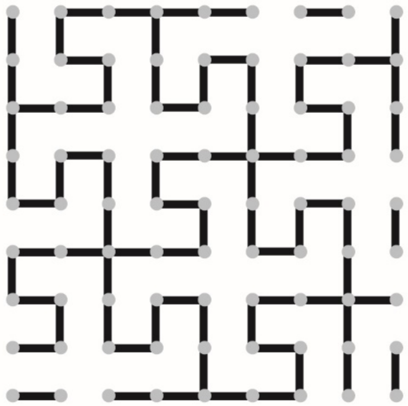
The square lattice of points - *a small part of*



A graph connecting every point of the lattice
Every lattice link is an edge of the graph

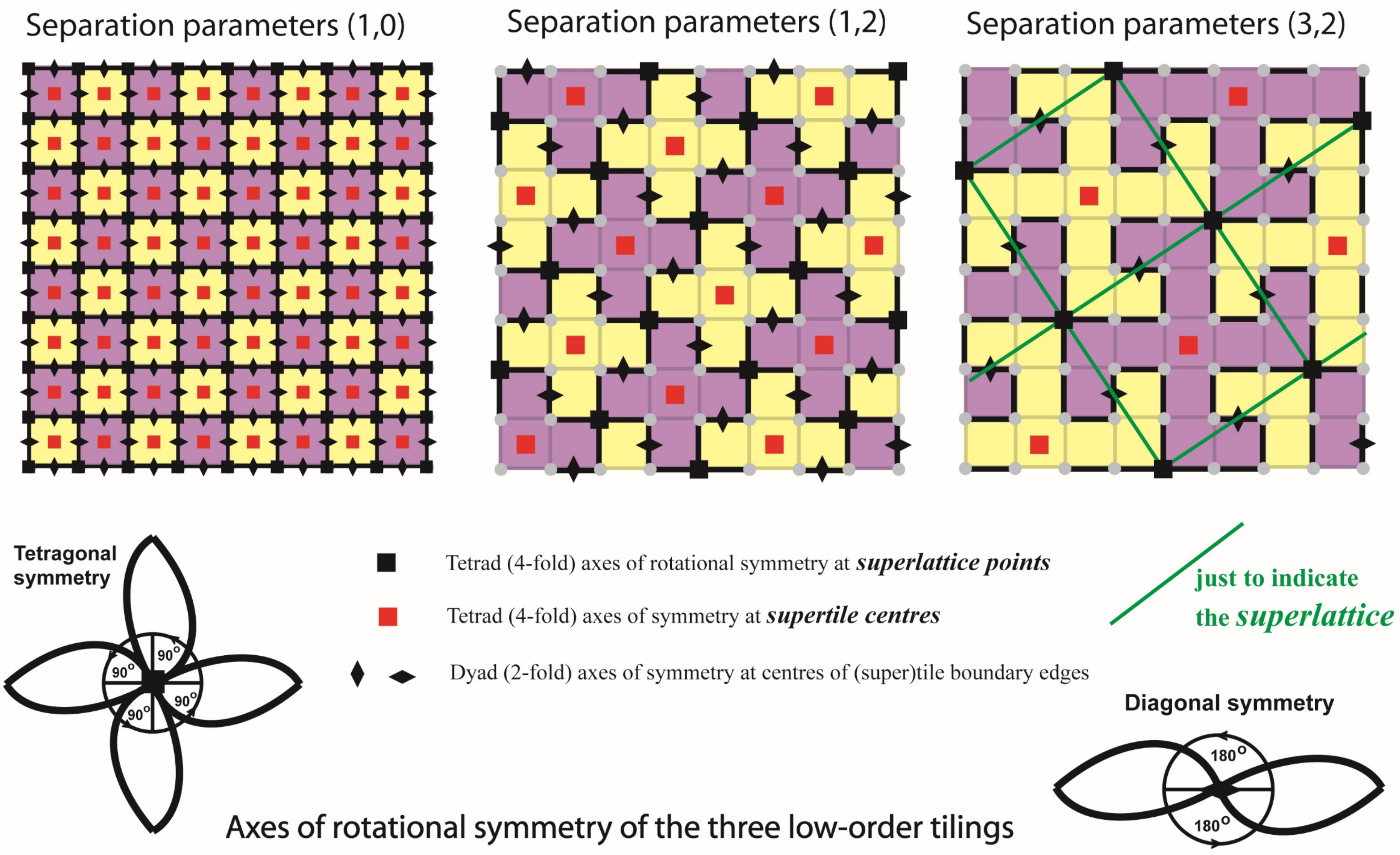


Another graph connecting every point
of the lattice, using only some lattice links.



Yet another graph connecting every l*attice point*
using still fewer lattice links

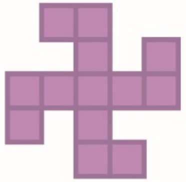
Structure and Symmetry of the Family of Tessellations



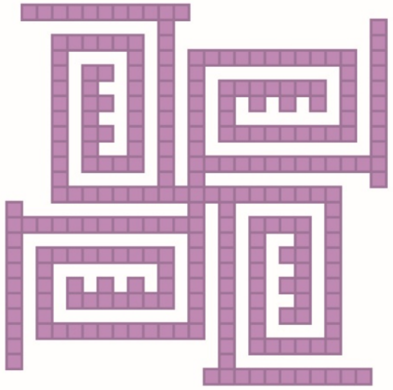
Axes of rotational symmetry of the three low-order tilings

(1,0) 1 tile persupertile

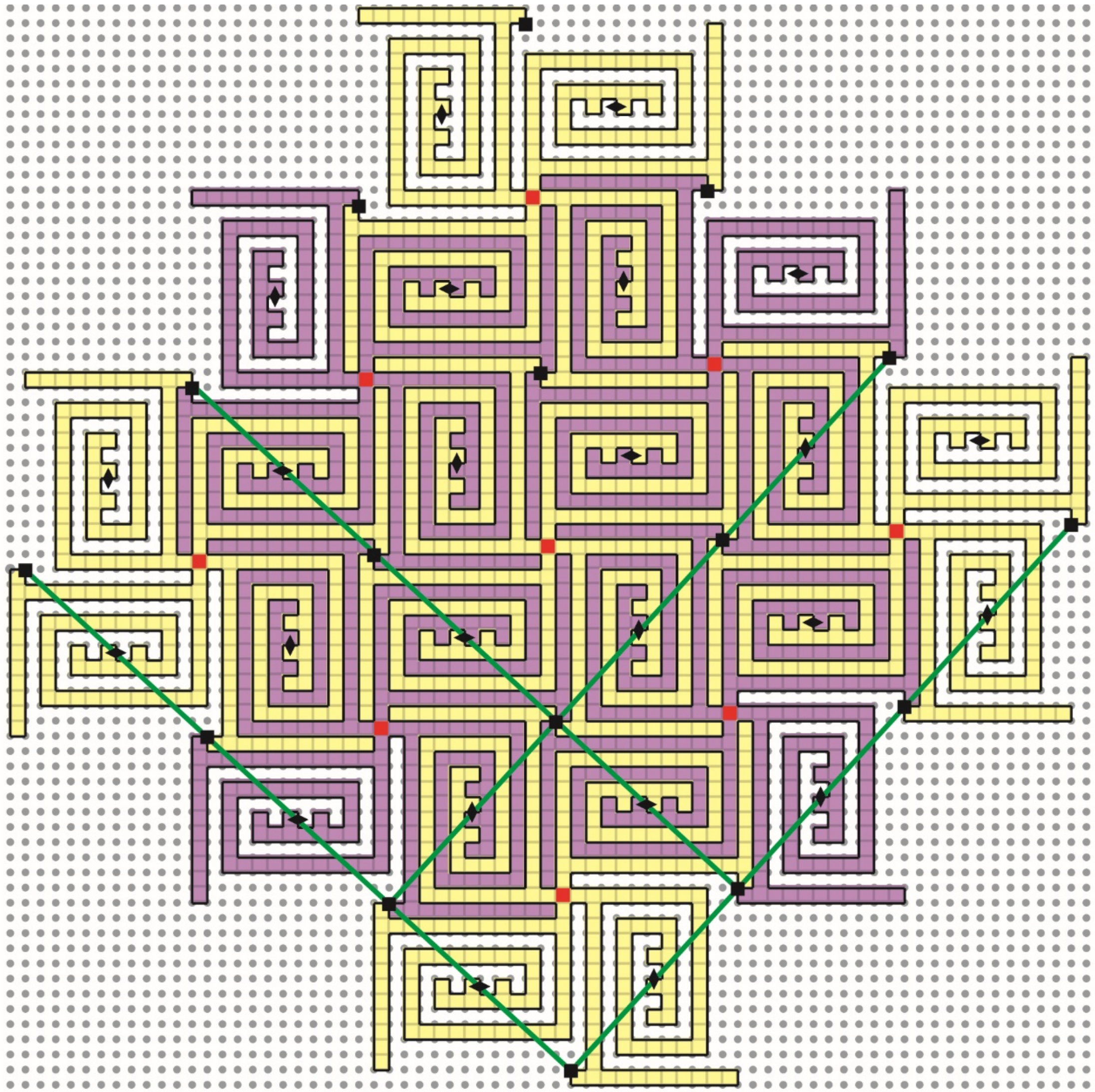
(1,2) 5 tiles per supertile



(3,2) 13 tiles per supertile



(11,12) 265 tiles per supertile



■ Tetrad (4-fold) axes of rotational symmetry at superlattice points

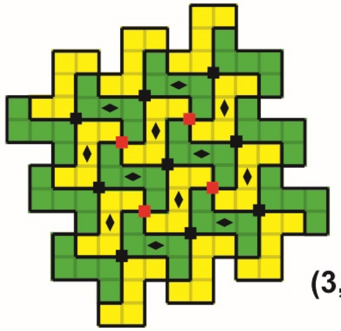
■ Tetrad (4-fold) axes of symmetry at supertile centres

◆ ◆ Dyad (2-fold) axes of symmetry at centres of supertile boundary edges

A higher-order tessellation, being **"Chinese Lattice Labyrinth" (11,12)**
in honour of ***MathsJam Conference*** 12/11/2016

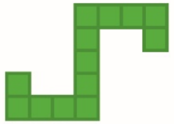
Serpentine Lattice Labyrinth (13,11)

in honour of MathsJam Conference **13/11/2016**

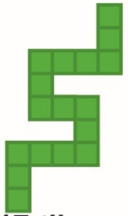


(3,1) 10/2 = 5 tiles per supertile

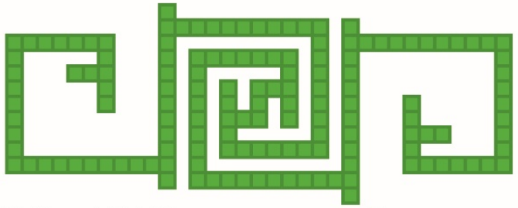
(3,3) 18/2 = 9 tiles persupertile



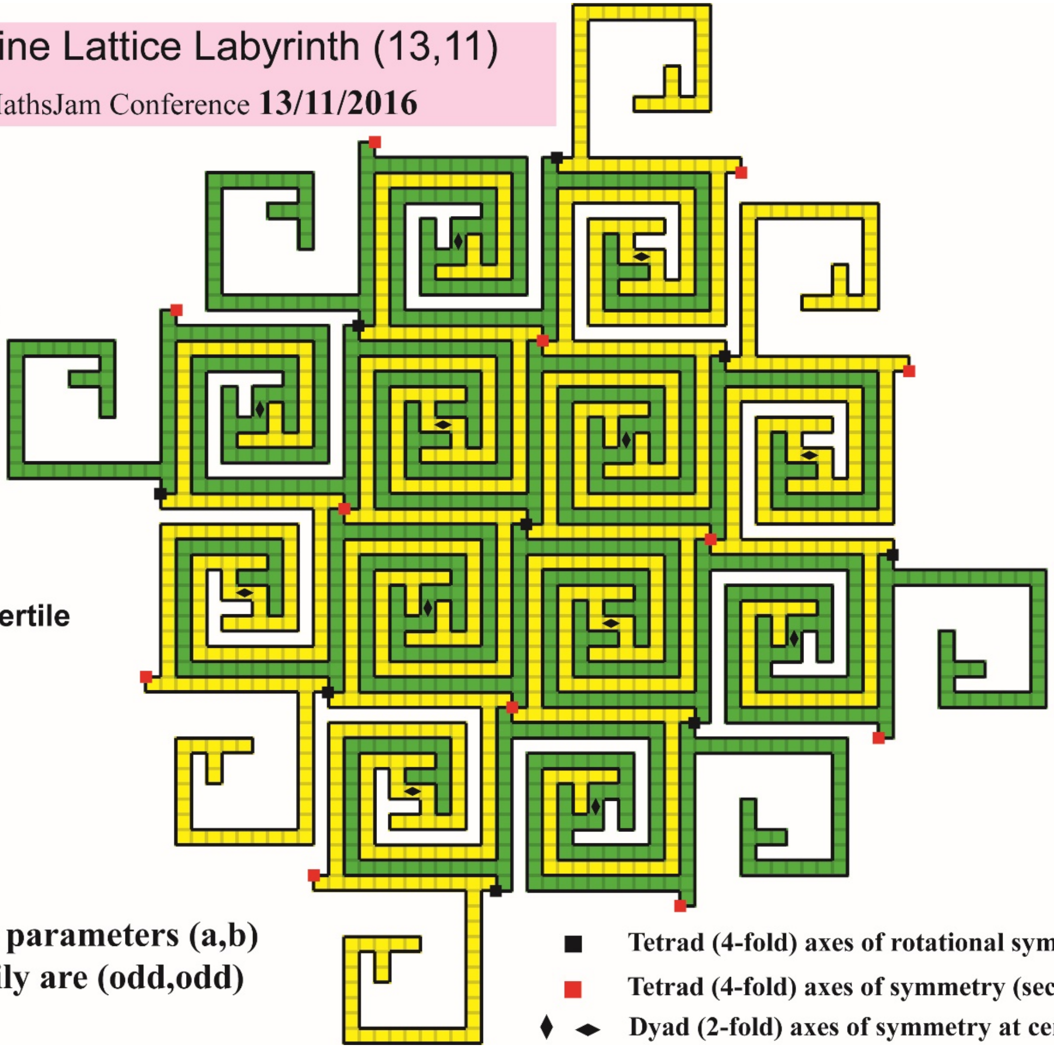
(5,1) 26/2 = 13 tiles per supertile



(5,3) 34/2 = 17 tiles persupertile



(13,11) 290/2 = 145 tiles per supertile



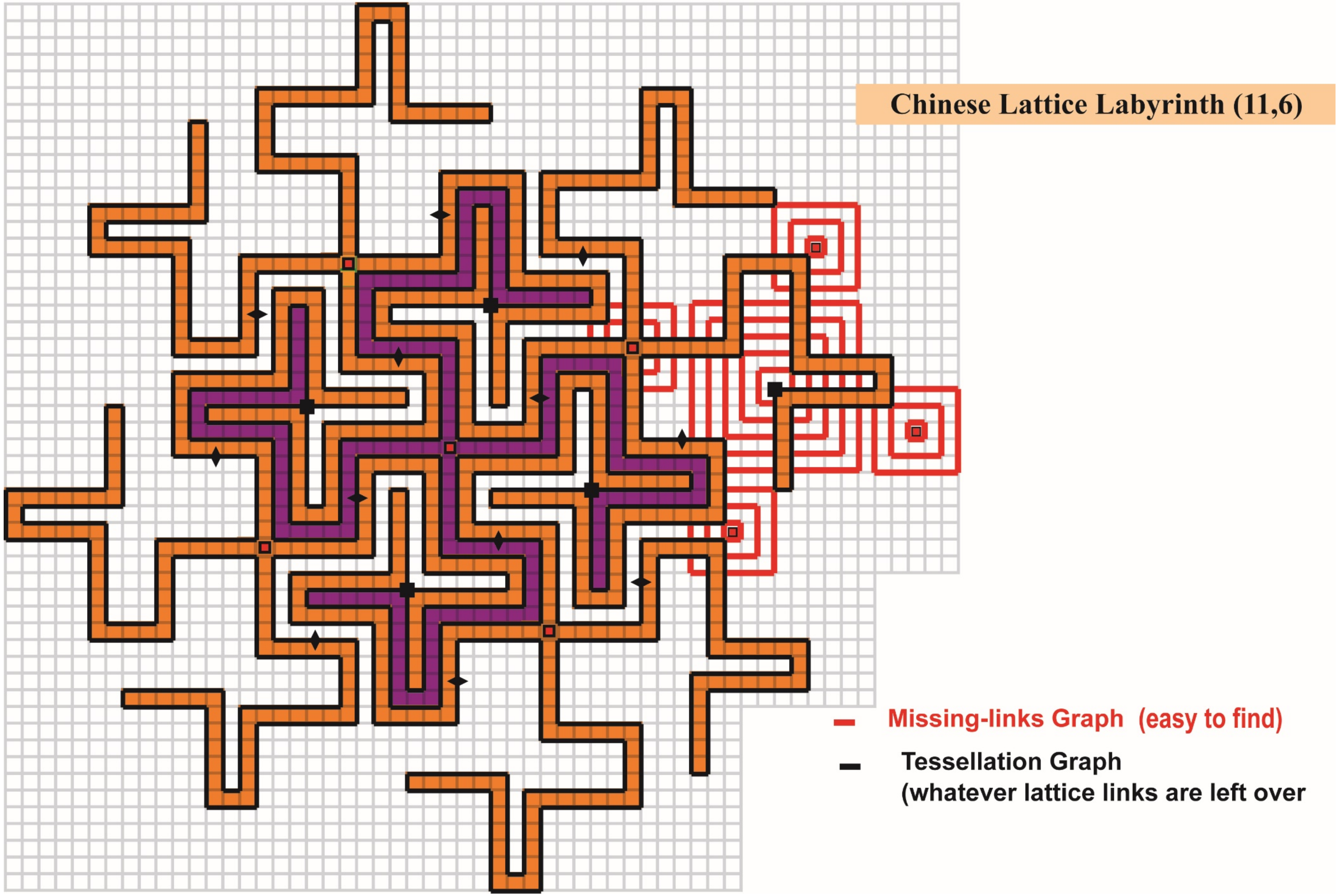
Separation parameters (a,b) in this family are (odd,odd)

■ Tetrad (4-fold) axes of rotational symmetry at superlattice points

■ Tetrad (4-fold) axes of symmetry (second family also at tile corners)

♦ ◆ Dyad (2-fold) axes of symmetry at centres of supertiles

The *missing-links graph* algorithm for generating lattice labyrinth tessellations



.......and as for LATTICE LABYRINTH TESSELLATIONS on the TRIANGULAR lattice
such as Trefoil (21,10) to celebrate October 21st, the birthday of **Martin Gardner**.......

That is for another day