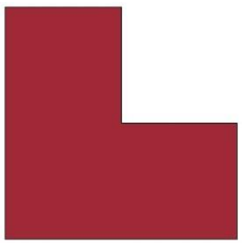
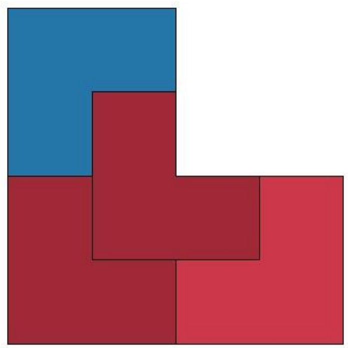
LONG DISTANCE COMMUNICATION IN THE CHAIR TILING

Alex Weston
Hao Fu
Sebastian Demean
HRUMC
April 6th
2013

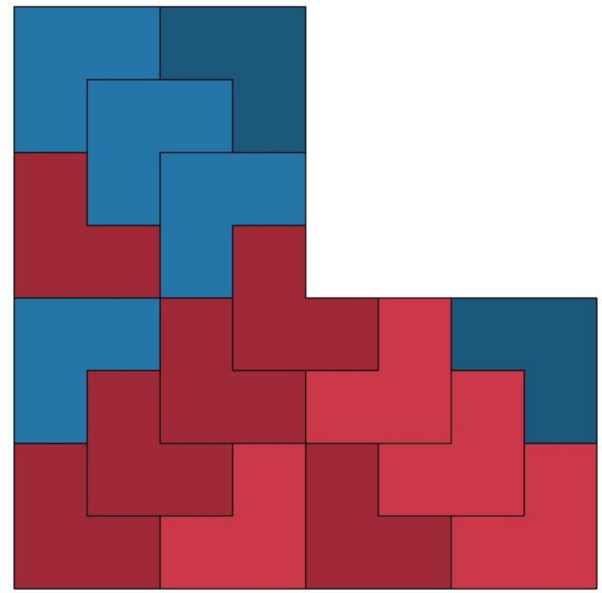
WHAT IS THE CHAIR TILING?



Level 0



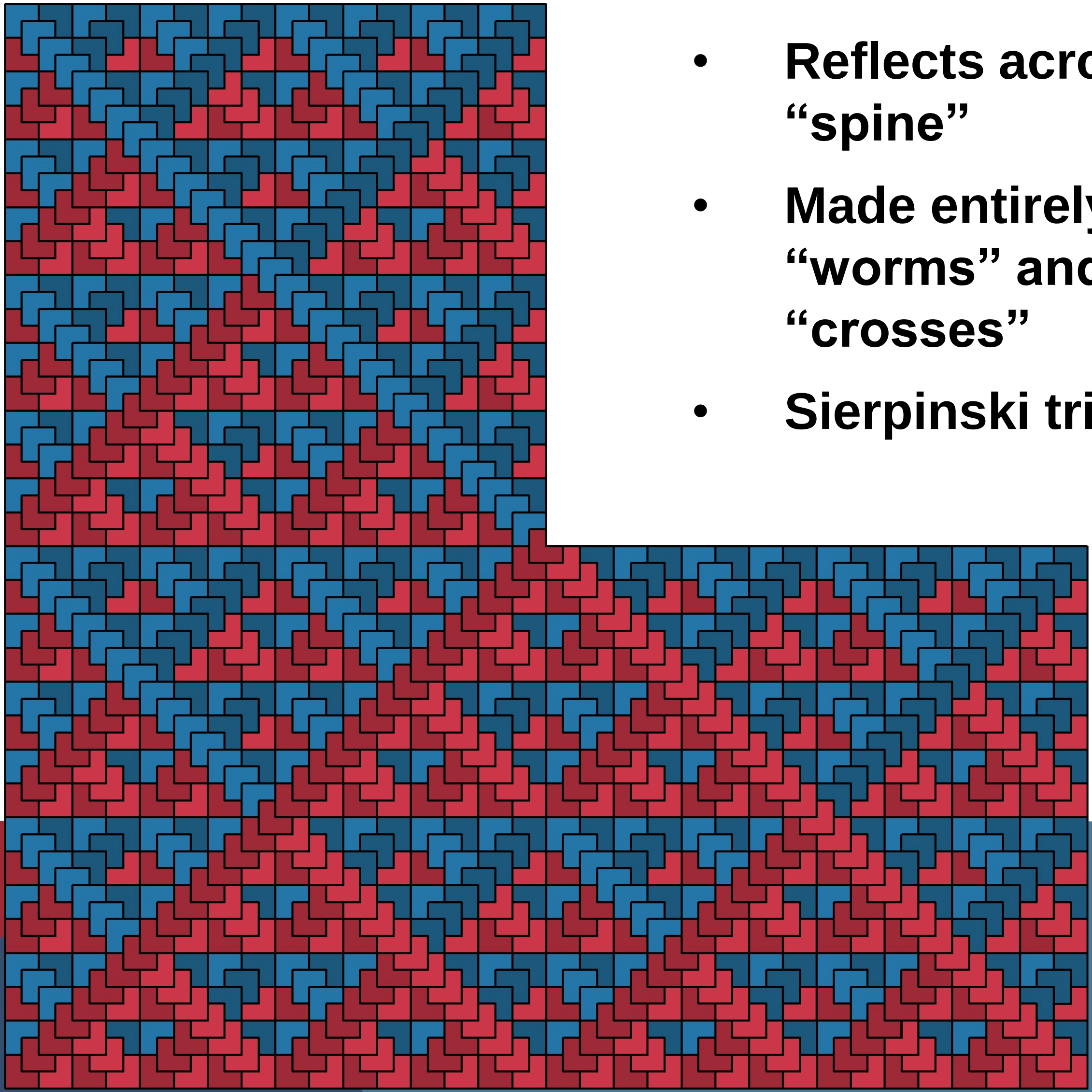
Level 2



Level 3

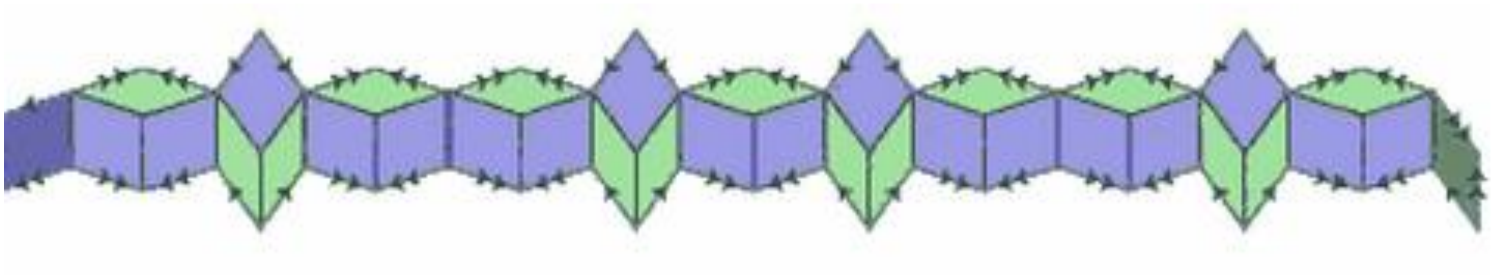
and so on

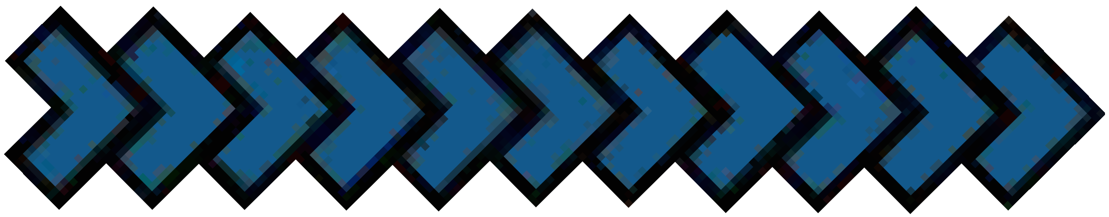
PROPERTIES OF THE CHAIR TILING



- Reflects across "spine"
- Made entirely of "worms" and "crosses"
- Sierpinski triangles

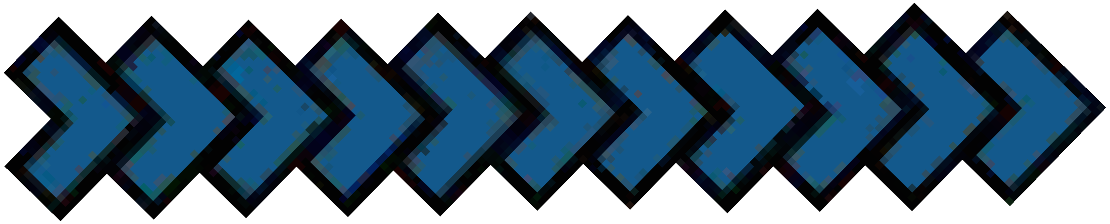
WORMS



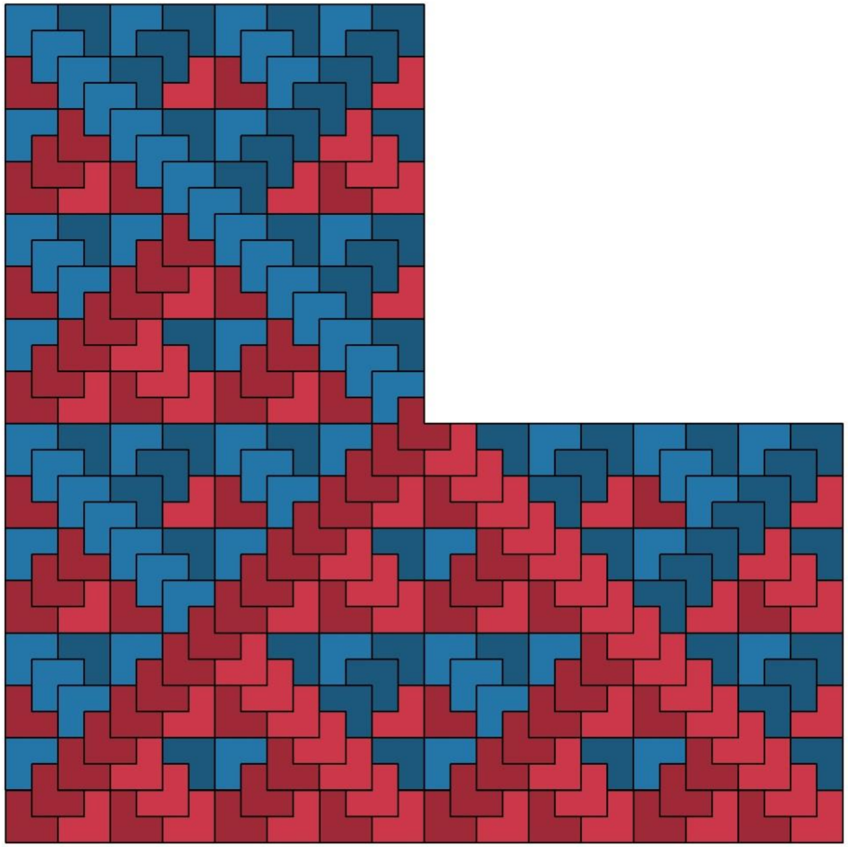


PROPERTIES OF WORMS

- **Worm-levels**
- **Length of worms**
  - "spine" has length 2^n
  - n-level worms have length 2^n-1



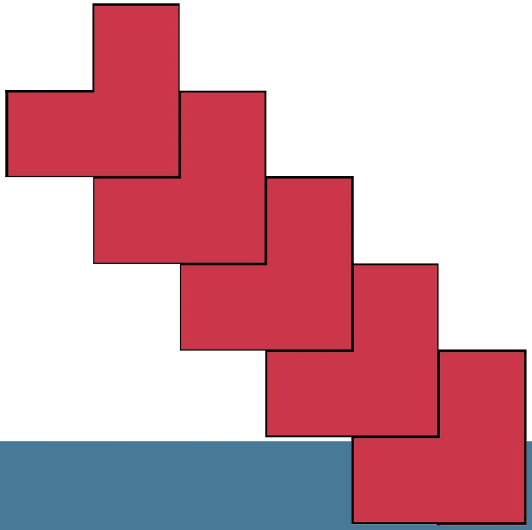
LONG DISTANCE COMMUNICATION



Every worm in the tiling forms a diagonal of some supertile

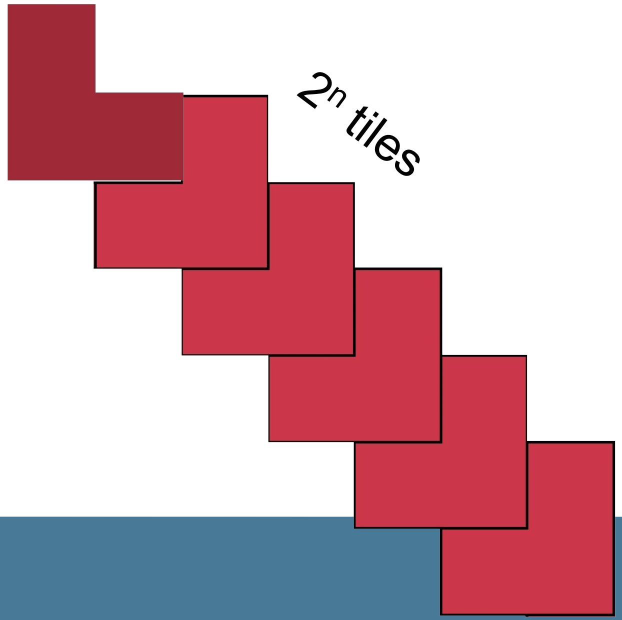
LONG DISTANCE COMMUNICATION

Given a worm of length k that ends in a particular prototile, we know the nth level supertile in the shape of the ending prototile.



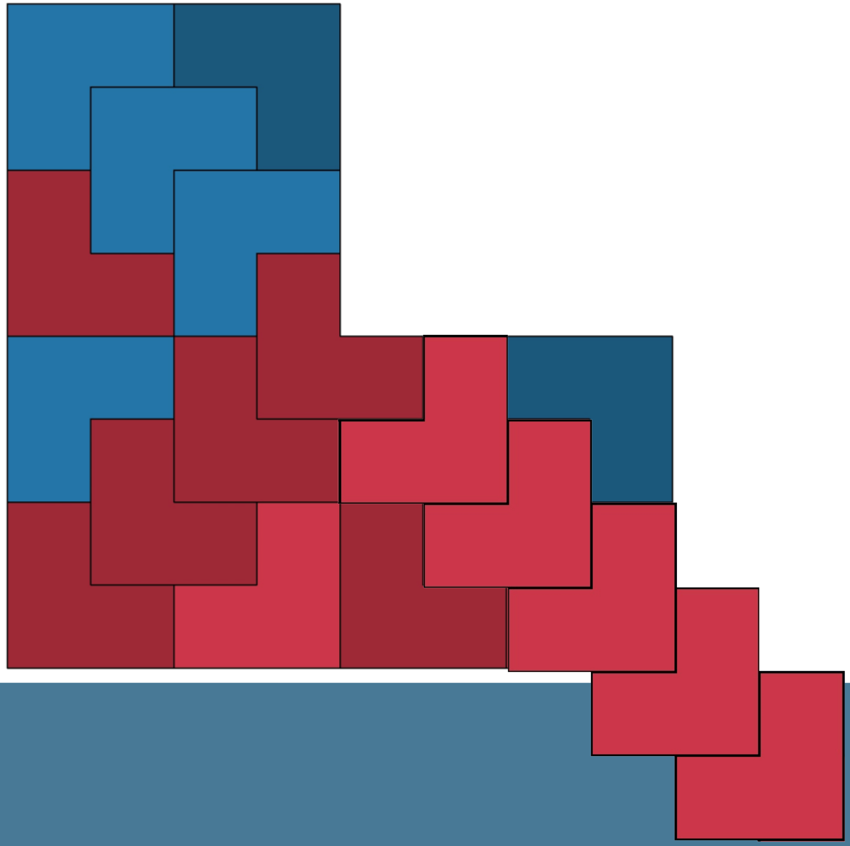
LONG DISTANCE COMMUNICATION

Given a worm of length k that ends in a particular prototile, we know the nth level supertile in the shape of the ending prototile.

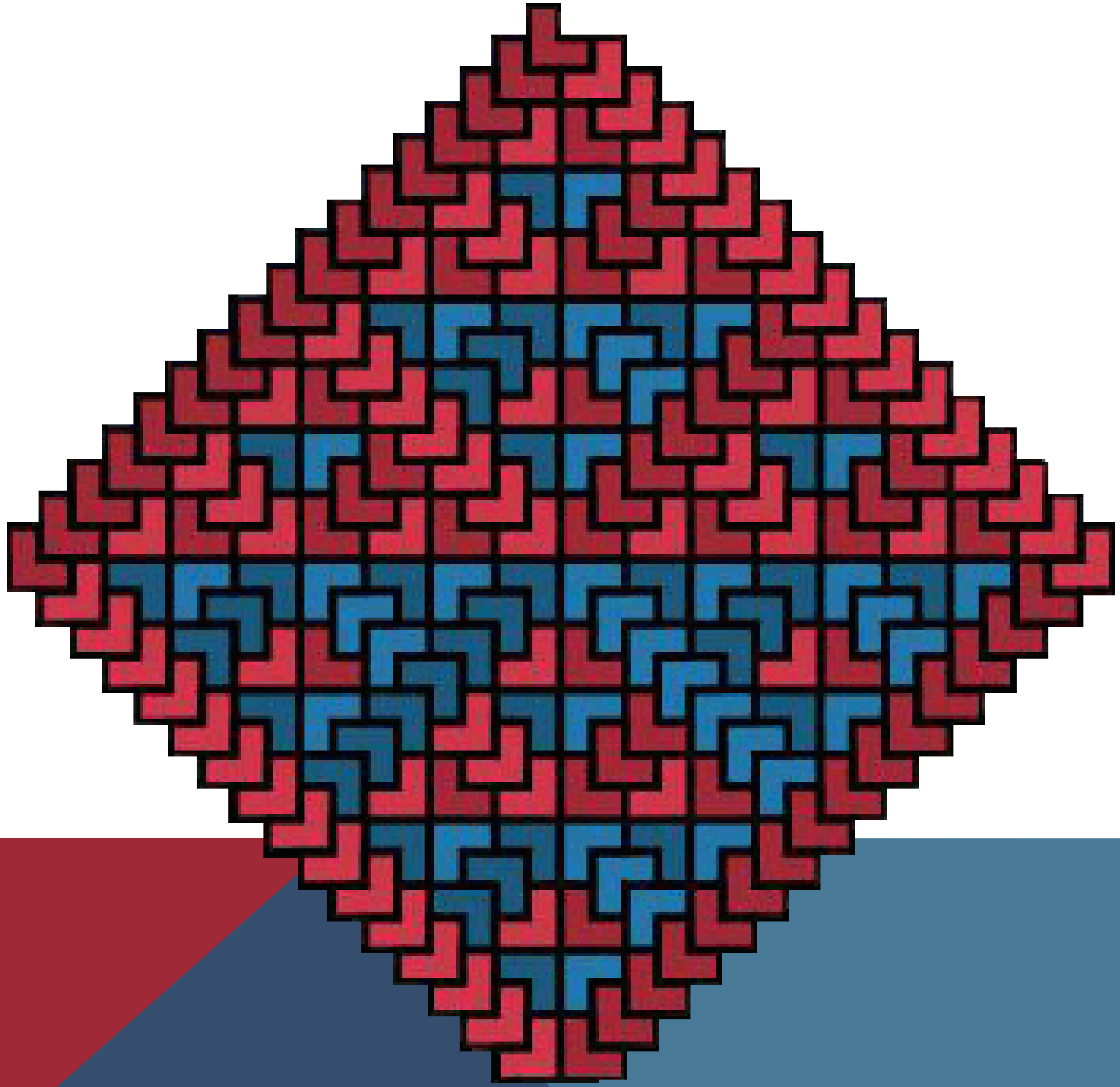


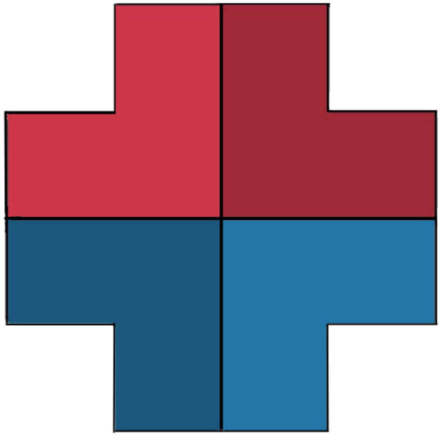
LONG DISTANCE COMMUNICATION

Given a worm of length k that ends in a particular prototile, we know the nth level supertile in the shape of the ending prototile.



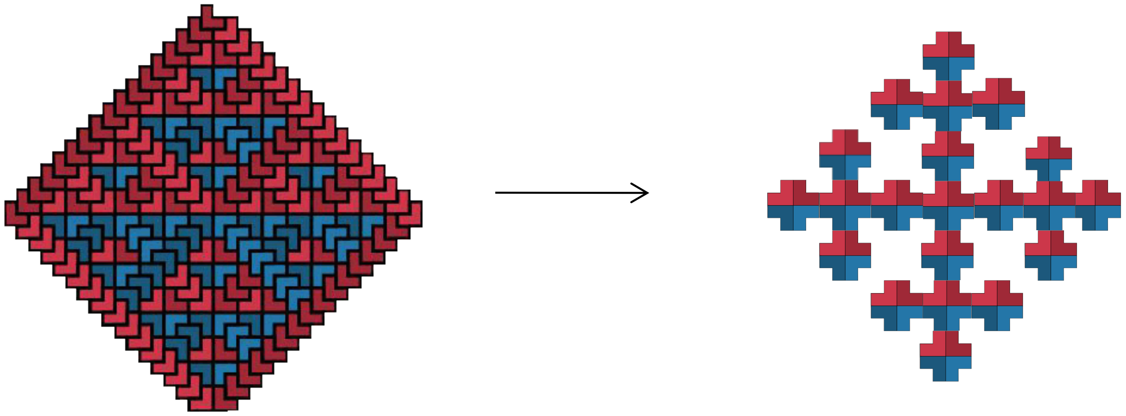
WORMS, SQUARES AND CROSSES





OTHER FORMS OF LONG DISTANCE COMMUNICATION

- Given a square, what can we say about it's surroundings?
- Worms of crosses?



- What information is sufficient to know the whole tiling?

REFERENCES

- Austin, David. "Penrose Tiles Talk Across Miles", Feature Column, American Mathematical Society