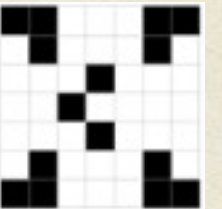


THE X-RULE



Universal Computation in a non-isotropic Life Like Cellular Automata

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DEFINITION

Let G be a group and let A be a set. A cellular automaton over the group G and the alphabet A is a map $\tau : A^G \rightarrow A^G$ satisfying the following property: there exist a finite subset $S \subset G$ and a map $\mu : A^S \rightarrow A$ such that

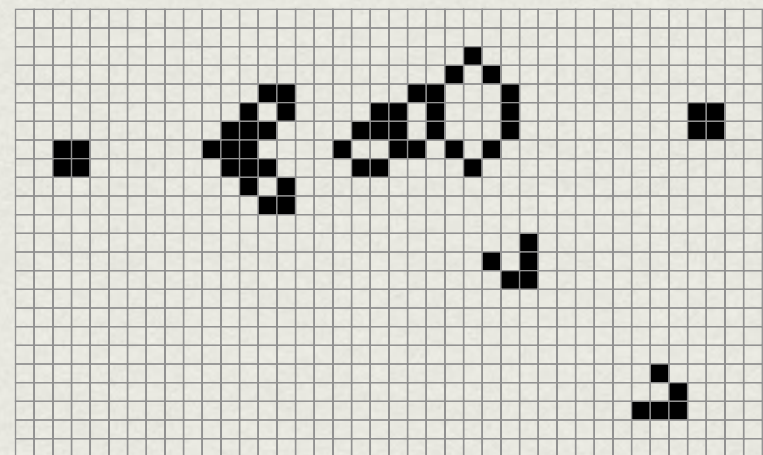
$$\tau(x)(g) = \mu((g^{-1}x)|_S) \tag{1}$$

for all $x \in A^G$ and $g \in G$, where $(g^{-1}x)|_S$ denotes the restriction of the configuration $g^{-1}x$ to S .

GAME OF LIFE

$$G = \mathbb{Z}^2 \quad A = \{0, 1\}$$

B3/S23

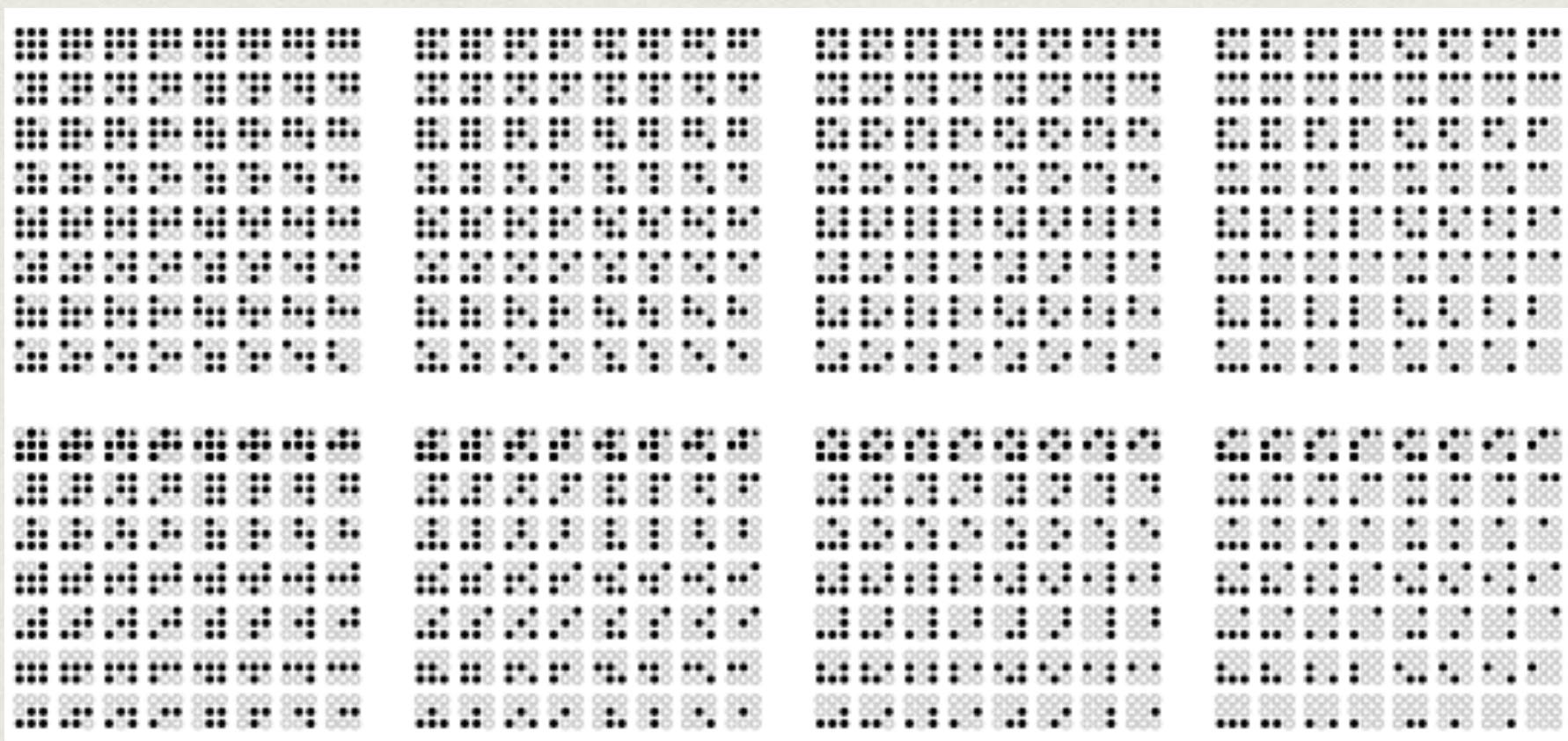


Glider Gun

$$S = \{x_{-1,1}, x_{0,1}, x_{1,1}, x_{-1,0}, x_{0,0}, x_{1,0}, x_{-1,-1}, x_{0,-1}, x_{1,-1}\}$$

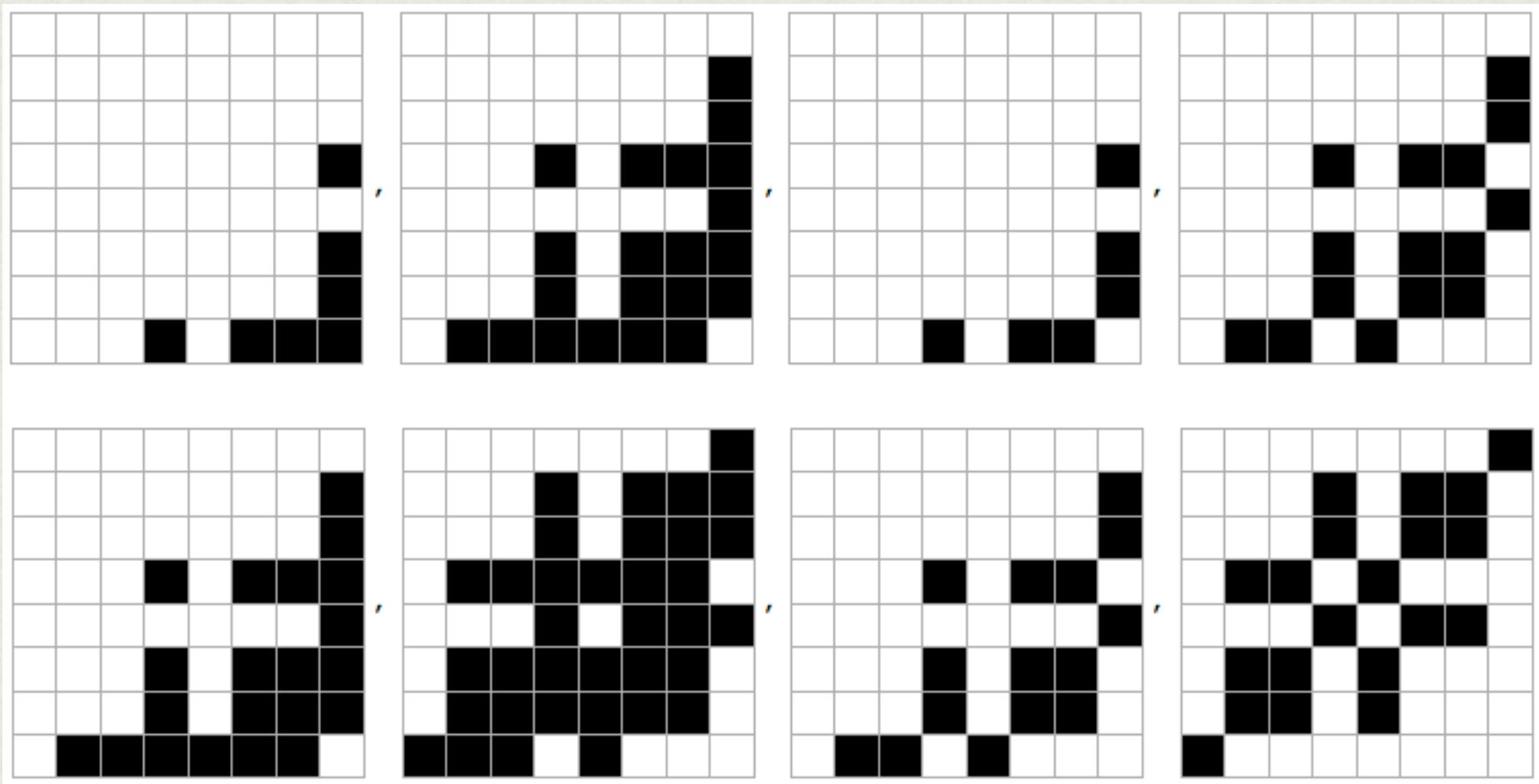


A^S



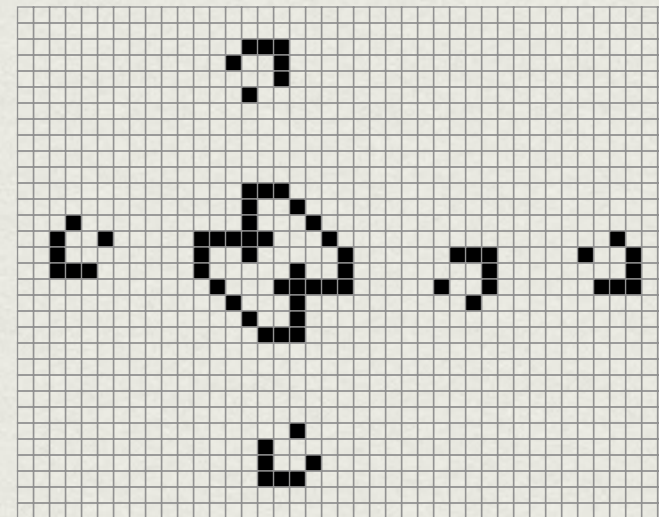
REGLA R

$$\mu : A^S \rightarrow A$$



REGLA R

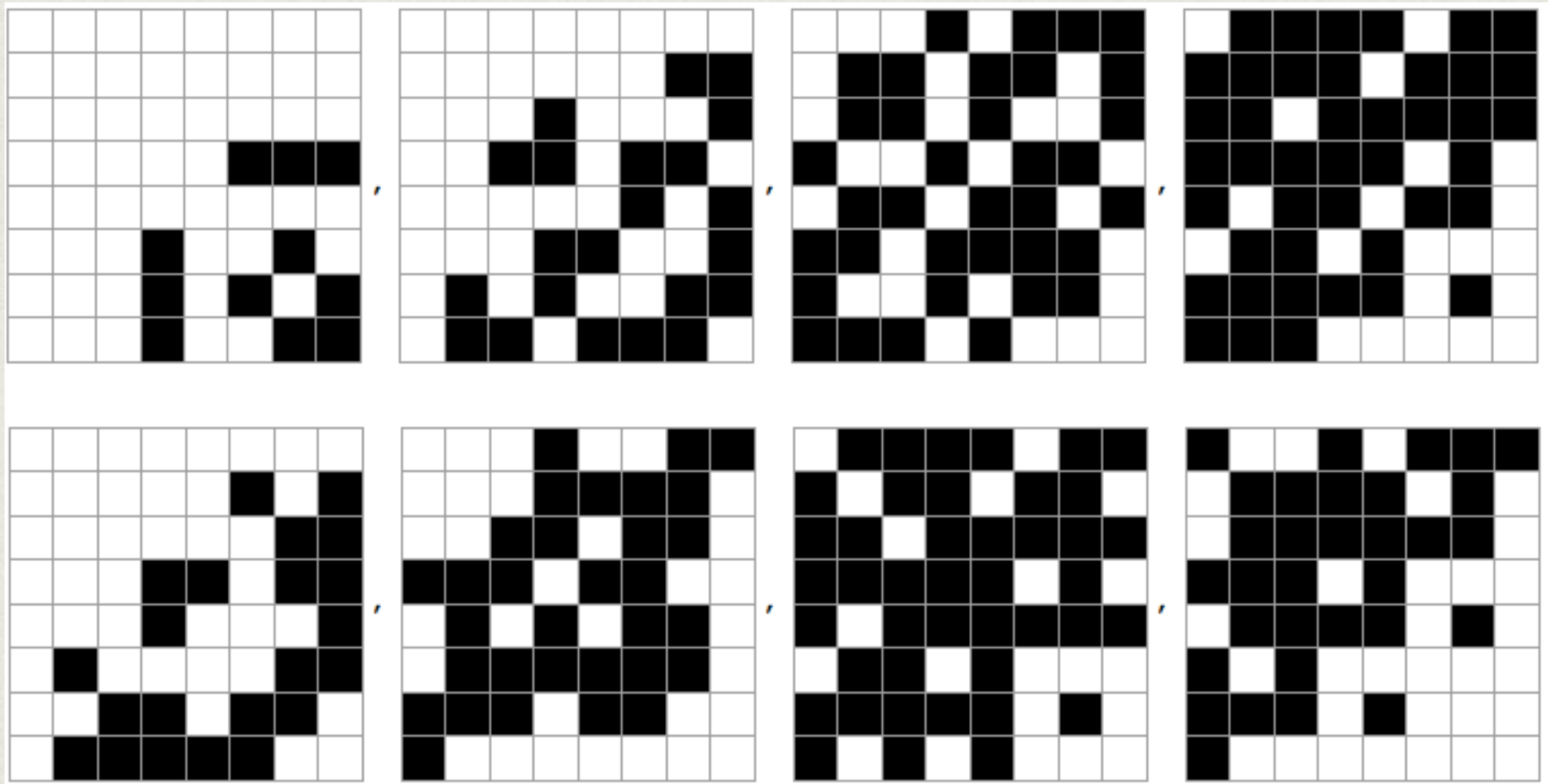
- Manuel Sapin (2004)

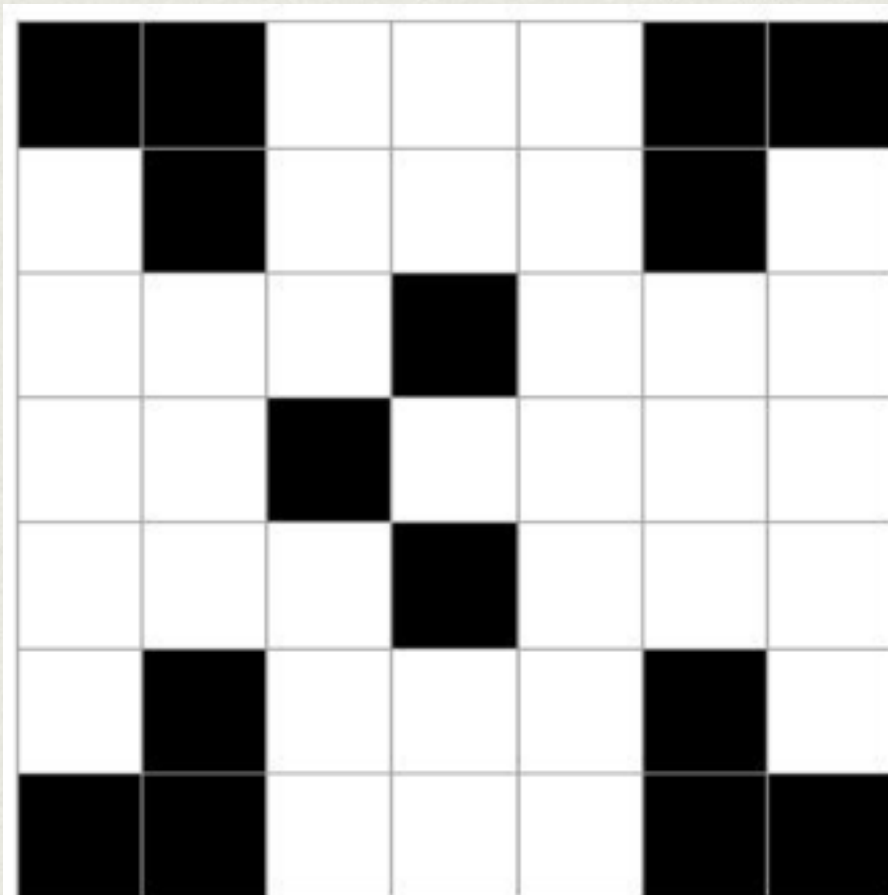


Glider Gun

REGLA R

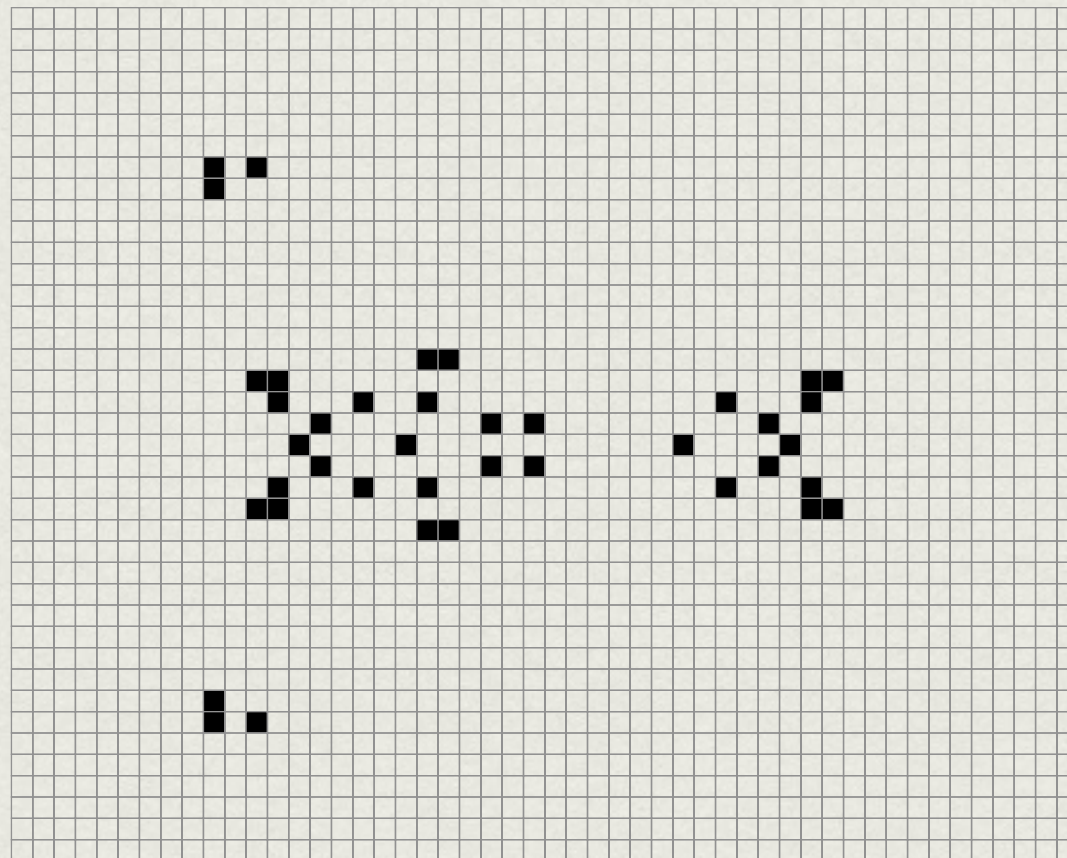
$$\mu : A^S \rightarrow A$$





X-Rule

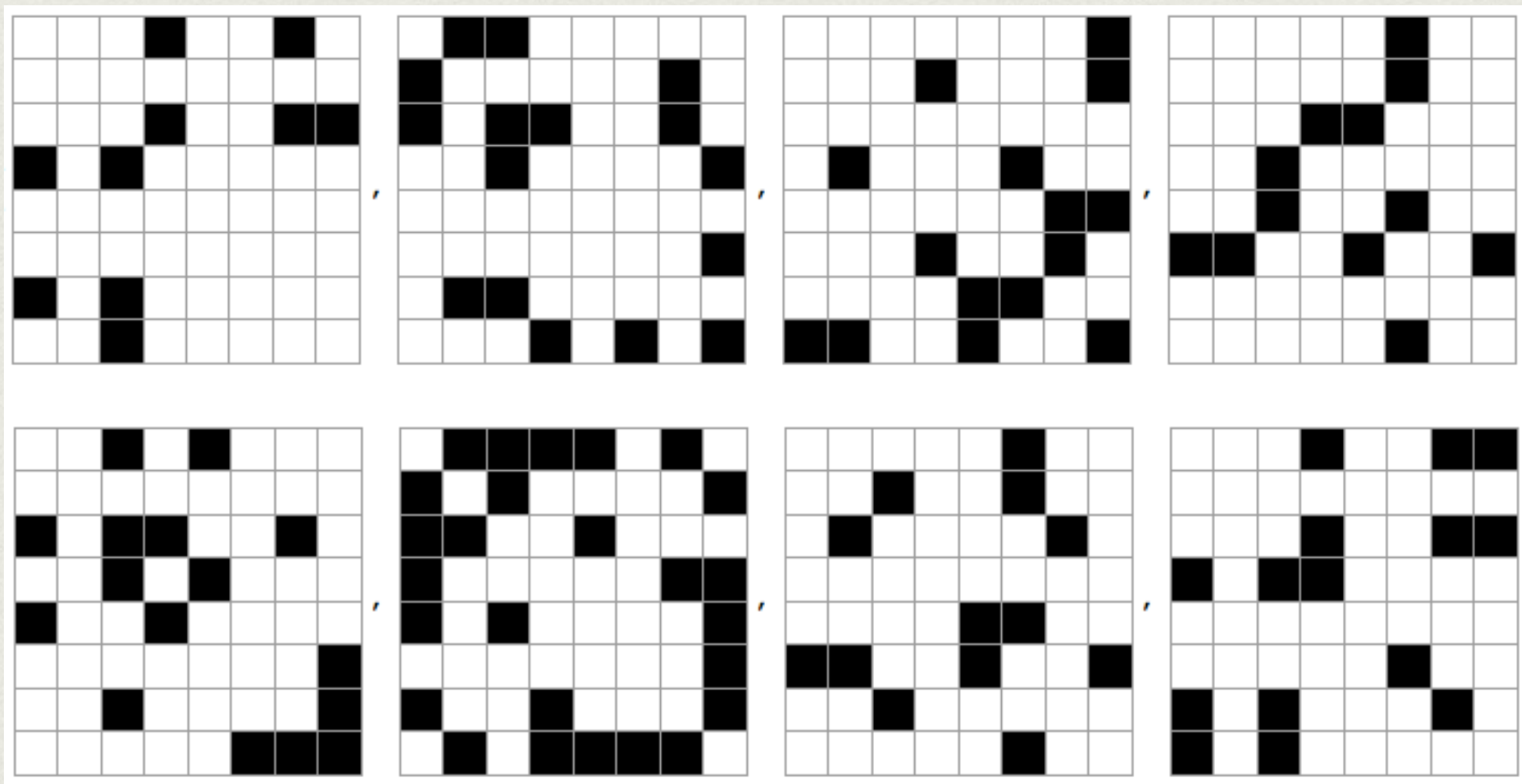
X-RULE



Glider Gun a

REGLA R

$$\mu : A^S \rightarrow A$$



RESEARCH GLIDERS



RESEARCH GLIDERS GUNS