* Spontaneous retinal waves drive activation of circuits throughout the developing amniote visual system before the start of visual experience.
* Visual map development in the midbrain, thalamus, and visual cortex is regulated by retinal waves.
* The informational complexity of retinal waves is suitable for establishing multiple intra- and inter-hemispheric visual connections before the start of visuomotor behavior.
* Combinations of new techniques will assist in understanding how emergent activity shapes transcriptional regulation and circuit development.