Procedural Phasor Noise
Thibault Tricard and Semyon Efremov, Cédric Zanni, Fabrice Neyret, Jonàs Martínez, Sylvain Lefebvre

Motivation

• The reformulation of Gabor noise to allow the generation of highly contrasted patterns
• The generation of bi-material microstructure using a fast procedural approach

Reformulation

Gabor noise is, at any point, a sum of weighted sine waves. We reformulate this as a single sine wave through phasor addition

\[ G(x) = \sum_{j=0}^{n} e^{-nh^2 \|x - x_j\|} \cdot \sin(F \cdot (x - x_j) \cdot u) \]

\[ G(x) = I(x) \cdot \sin(F \cdot x \cdot u + \varphi(x)) \]

In each point we compute the instantaneous phase \( \varphi \) and the local intensity \( I \).
Those two information can then be reinterpreted using a sine wave or any other periodic function

Results

The reformulation we propose allows us to control precisely the oscillation shape, and to create multi-material objects with controlled ratio and orientation.