IMUB

UNIVERSITAT DE BARCELONA

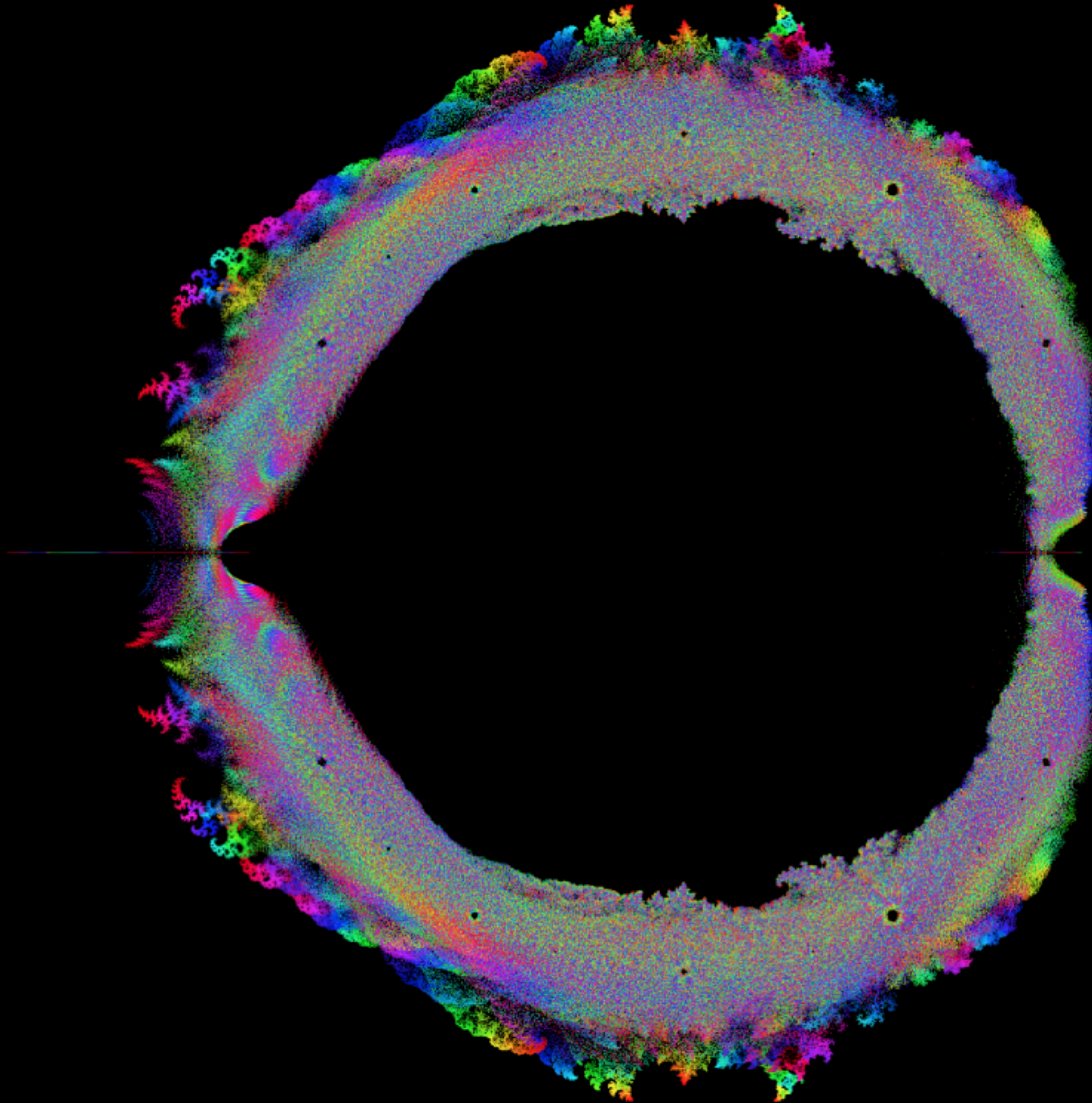
Thank you!

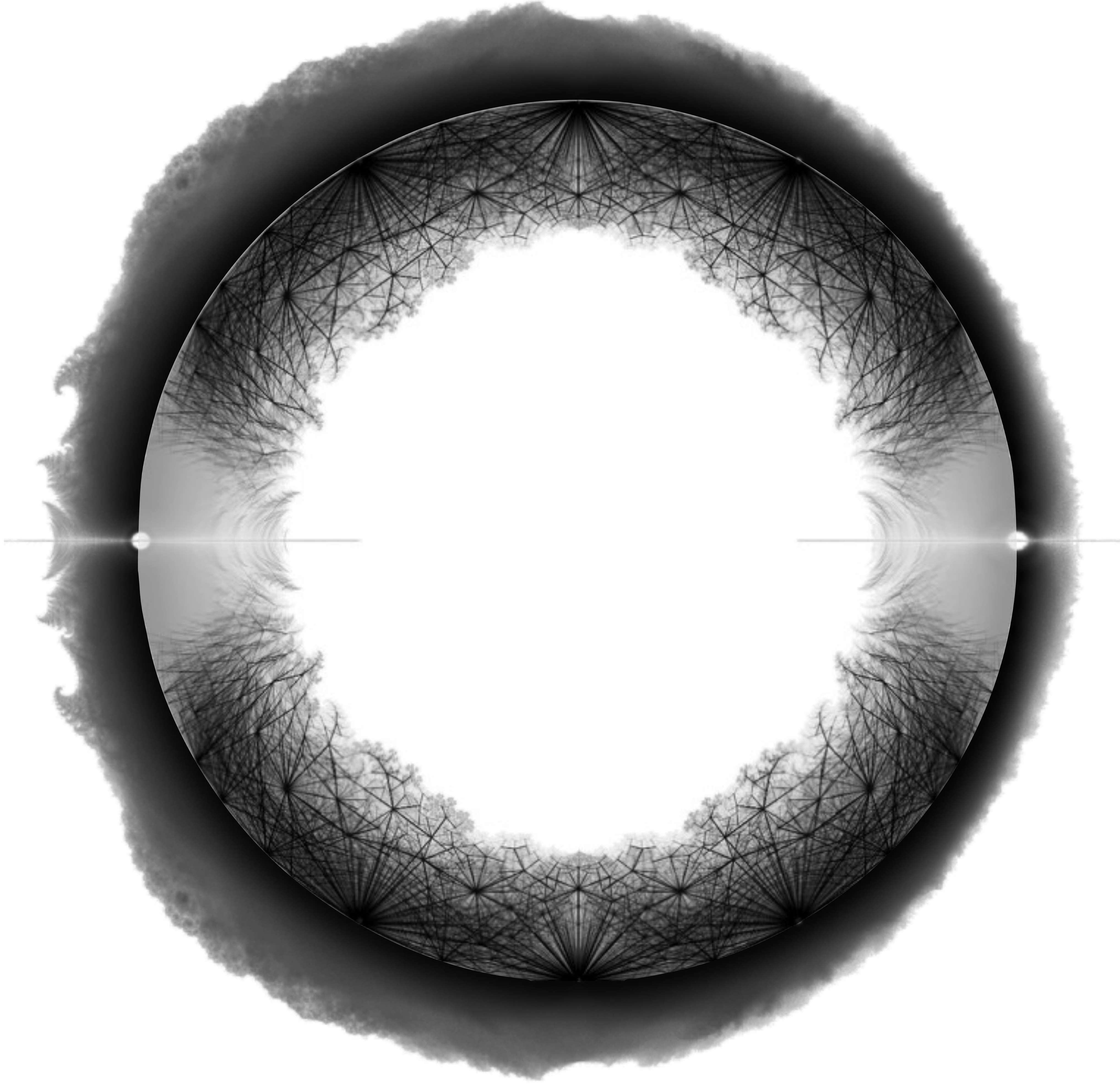
"If you wish to advance into the infinite, explore the finite in all directions."

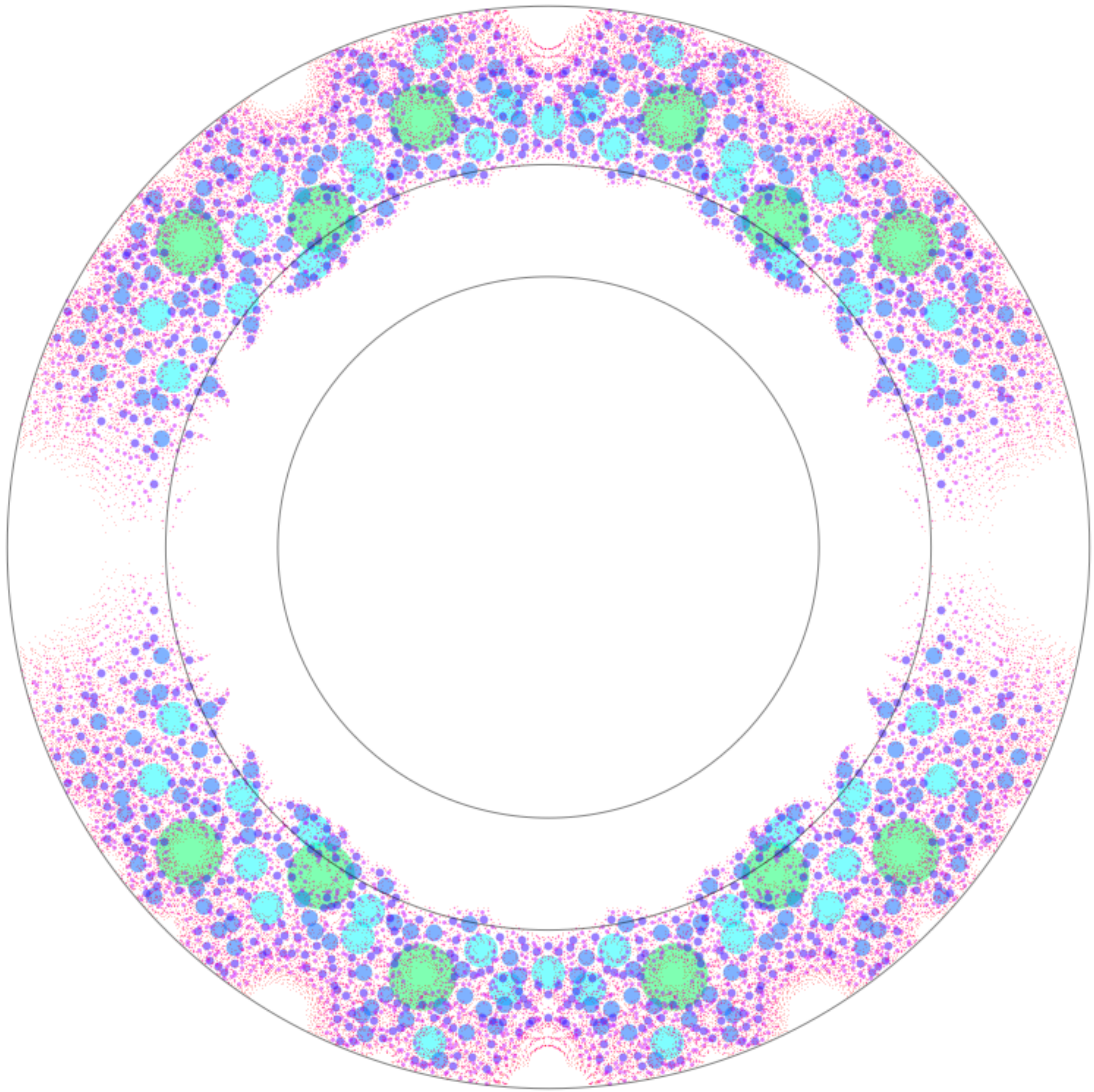
- Goethe.

Bernat Espigulé

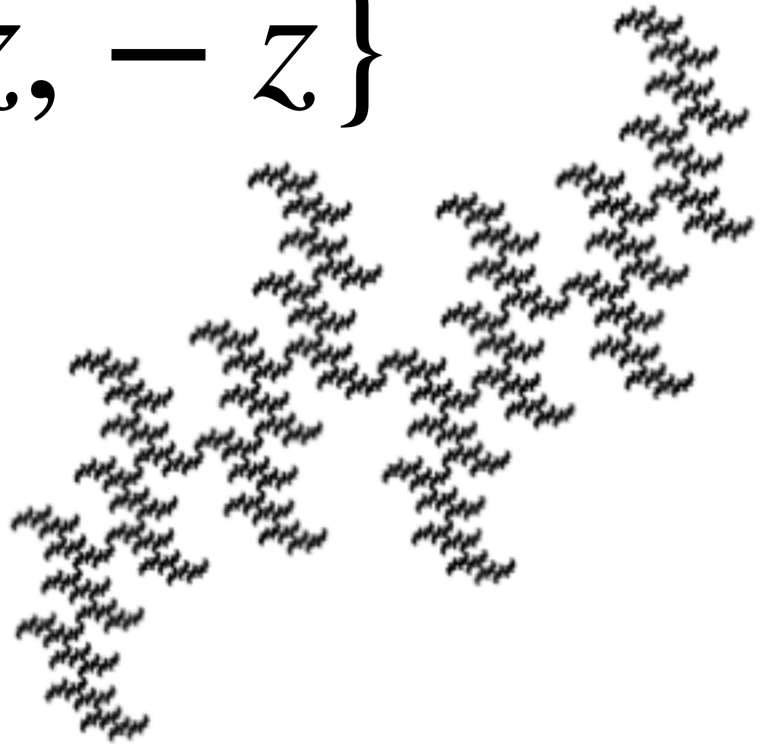
Holomorphic Dynamics Group
Núria Fagella & Xavier Jarque

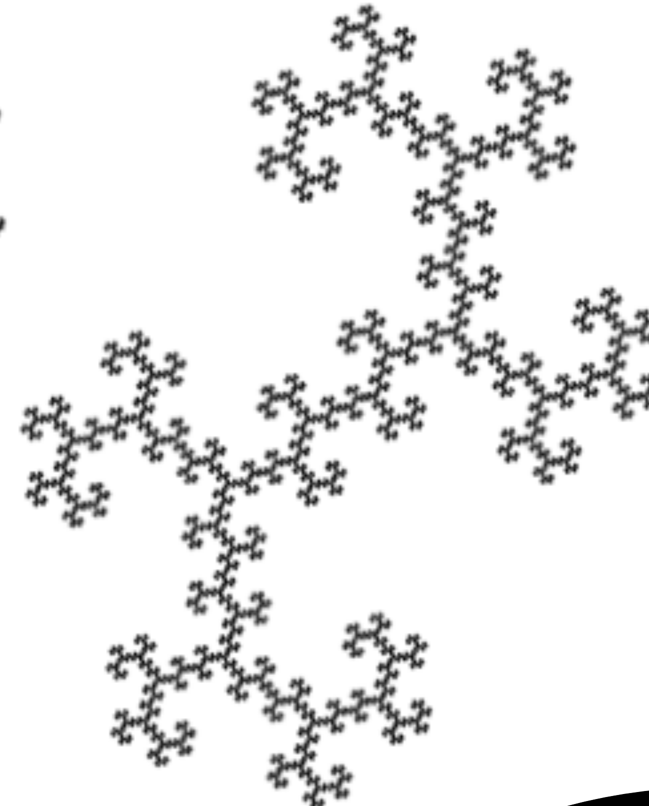


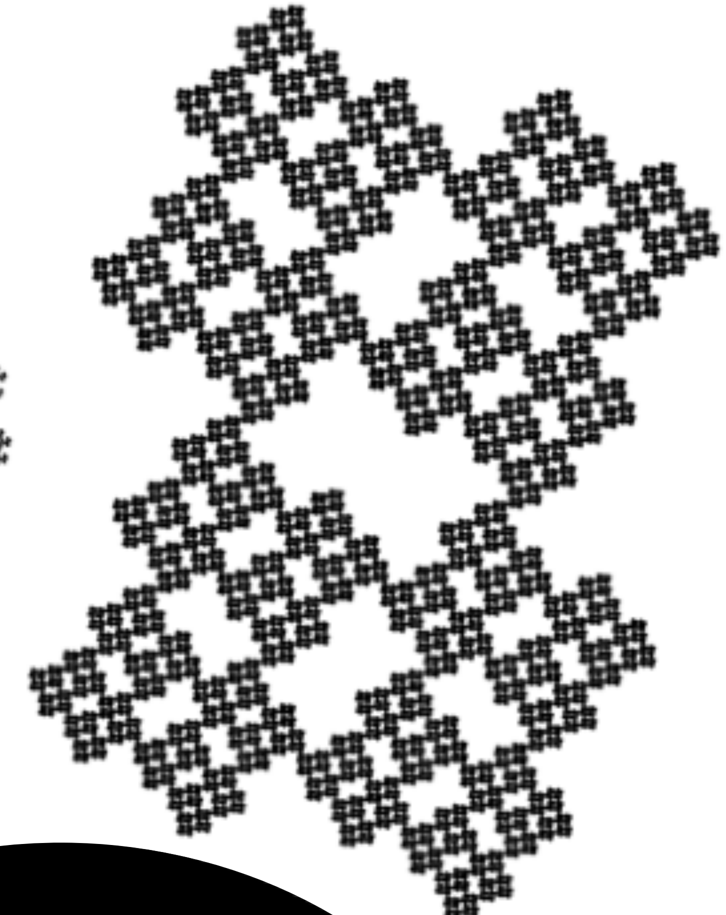


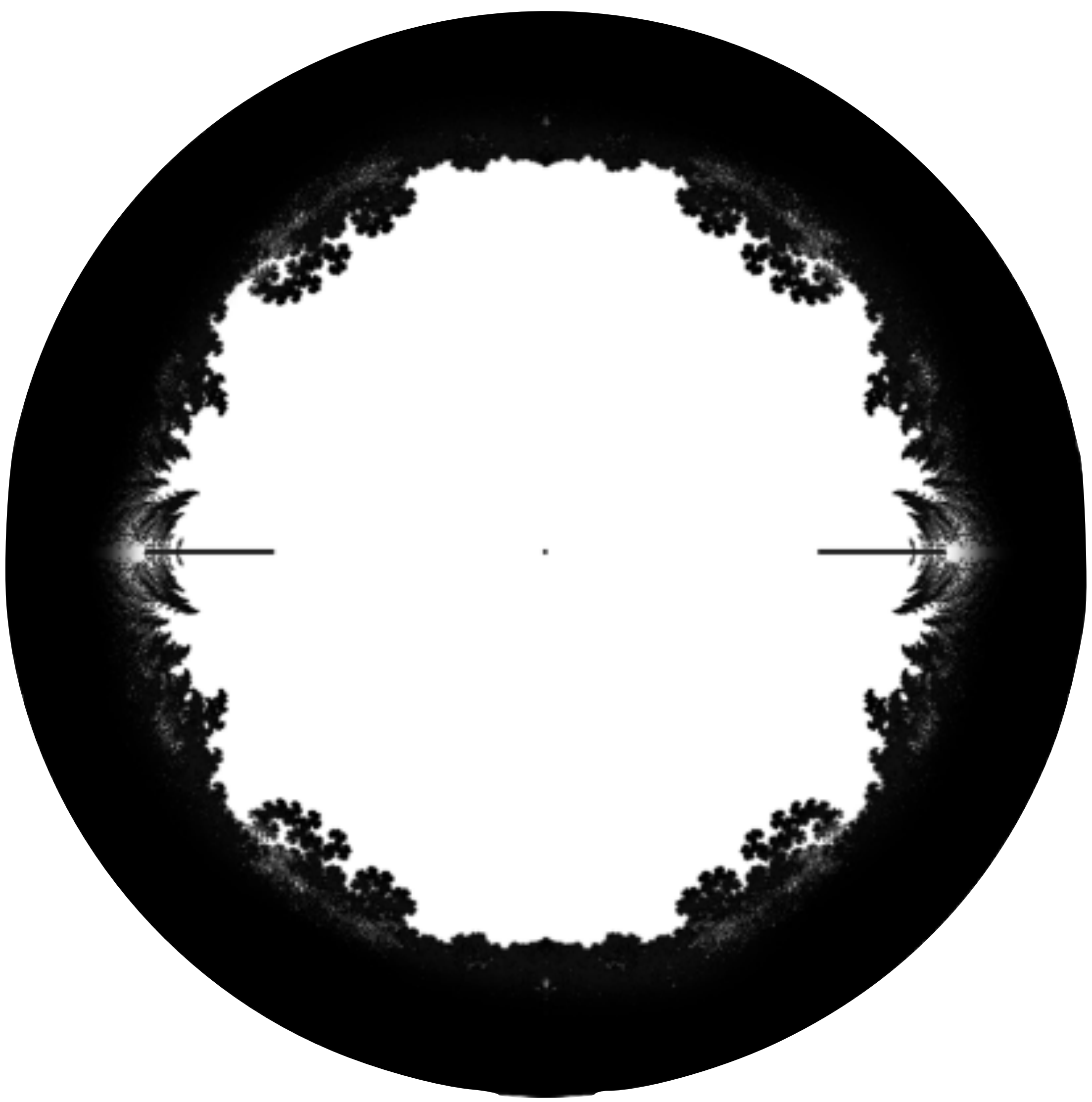


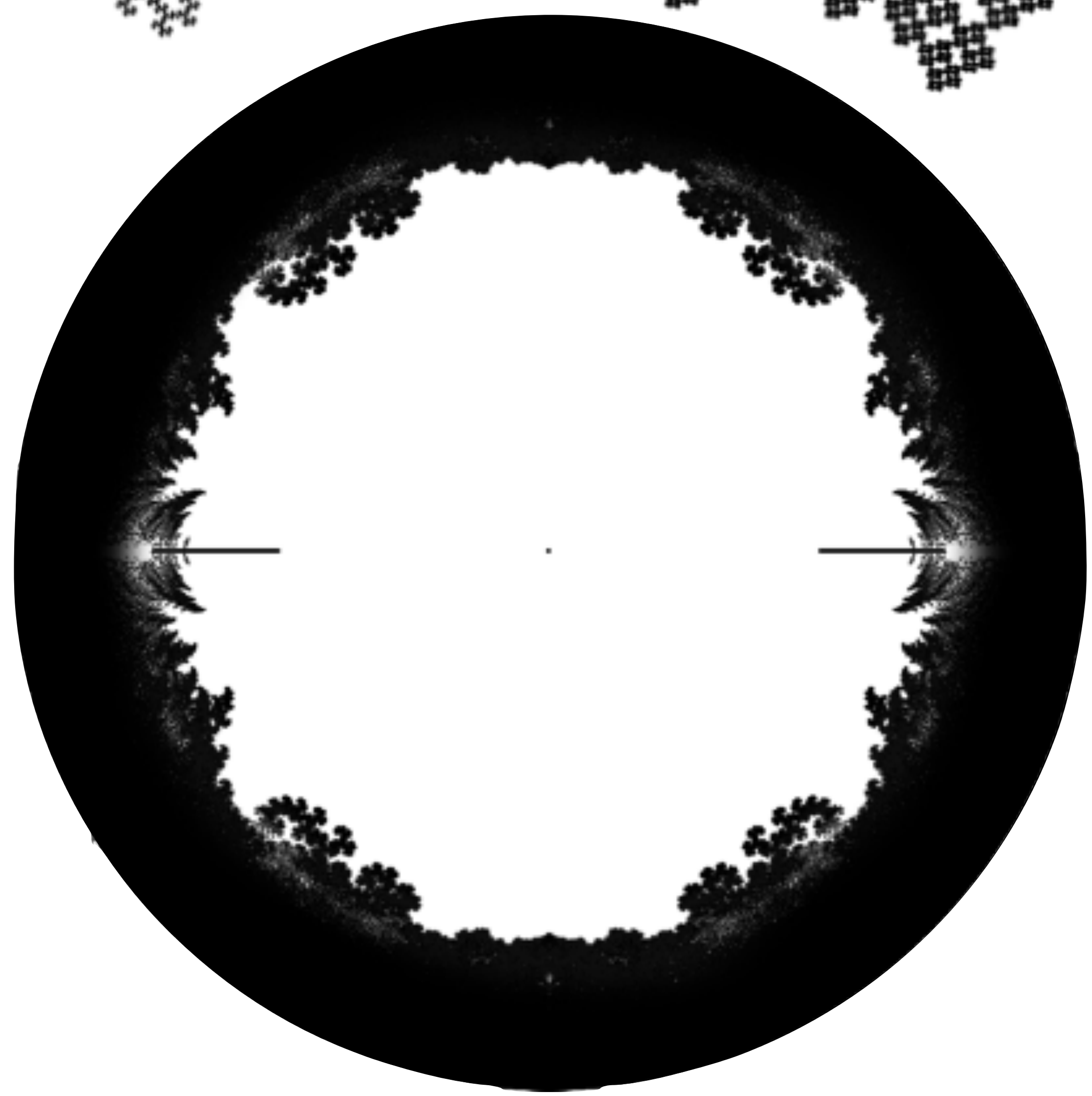
$T\{z, -z\}$



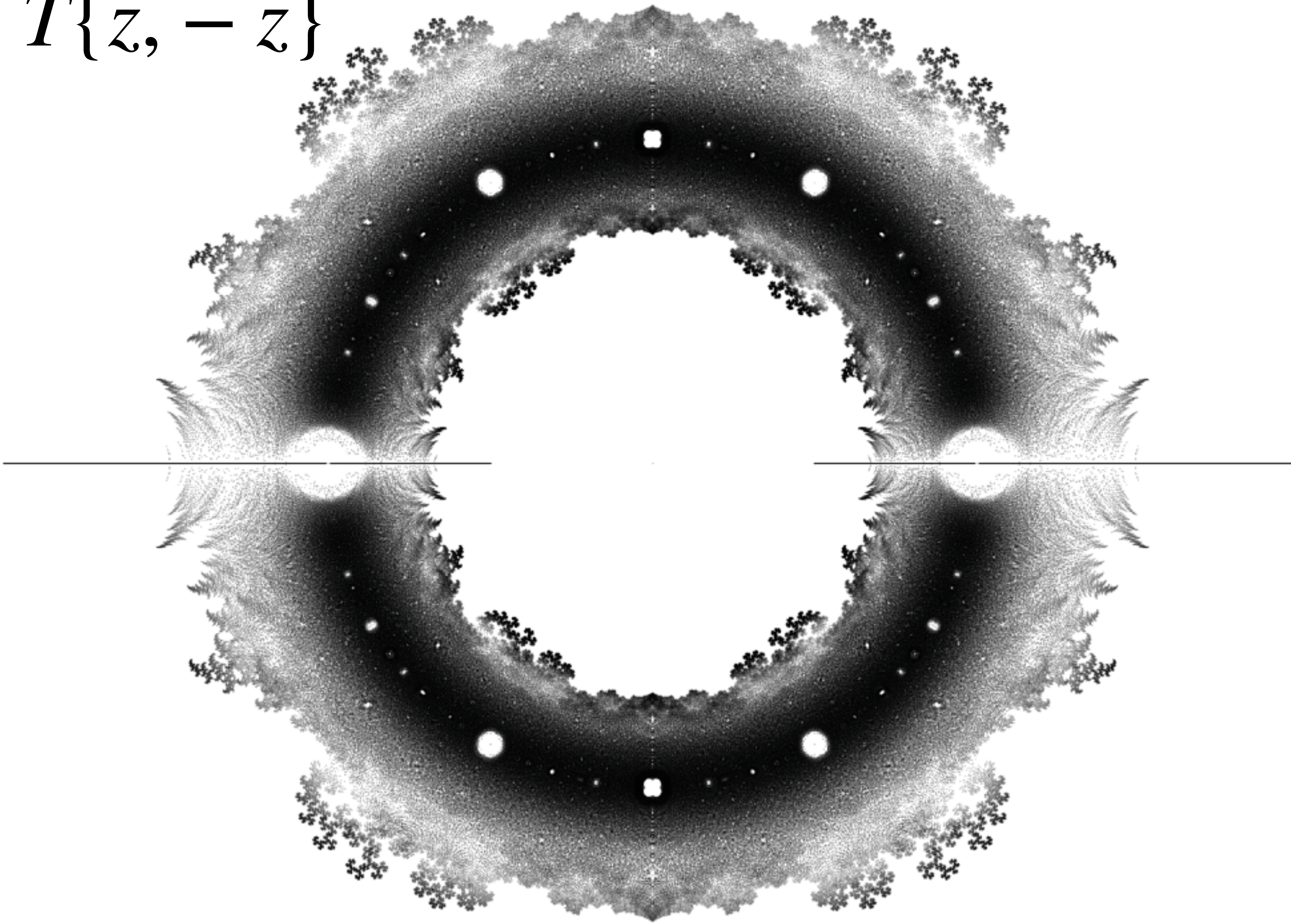




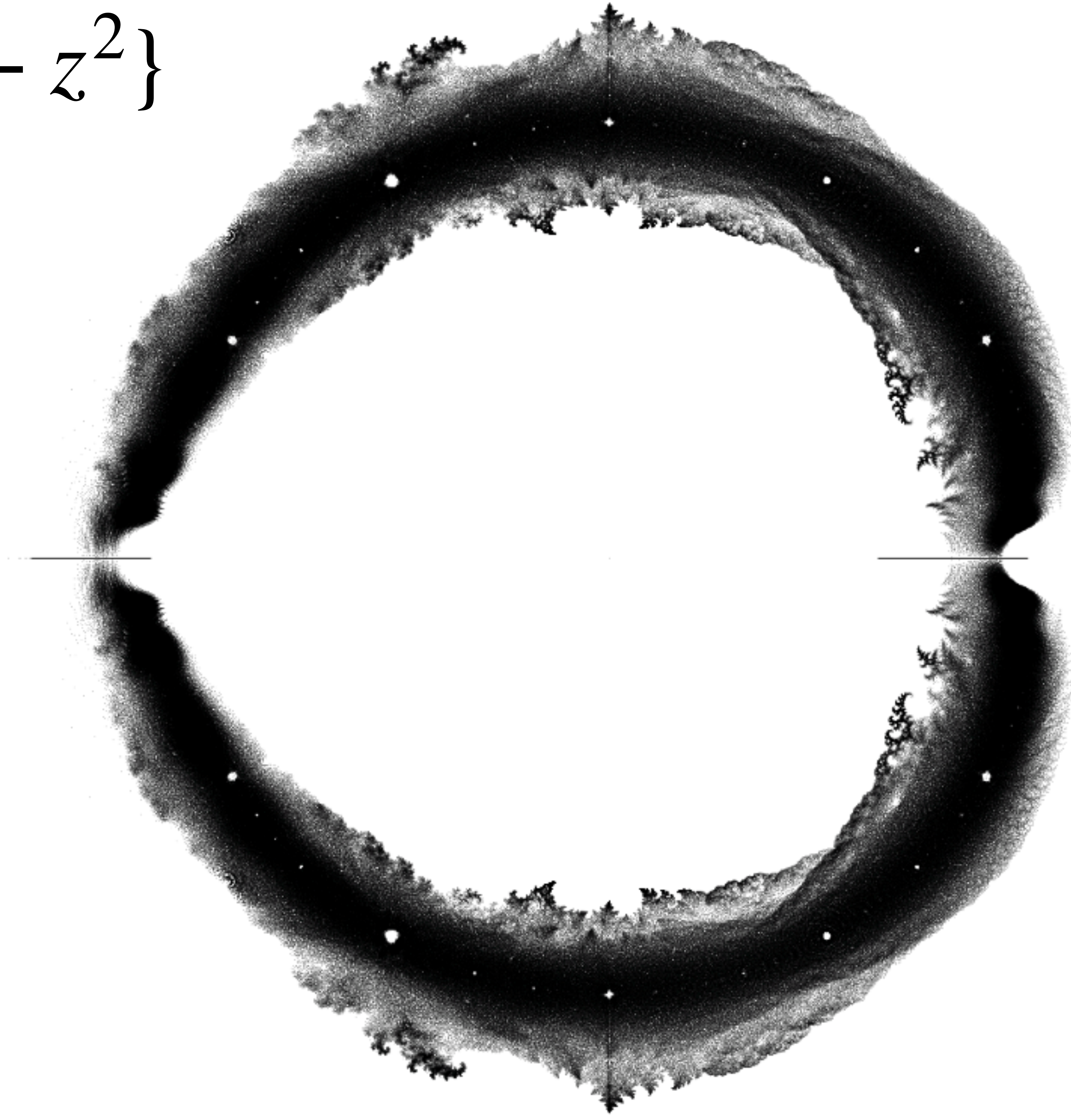


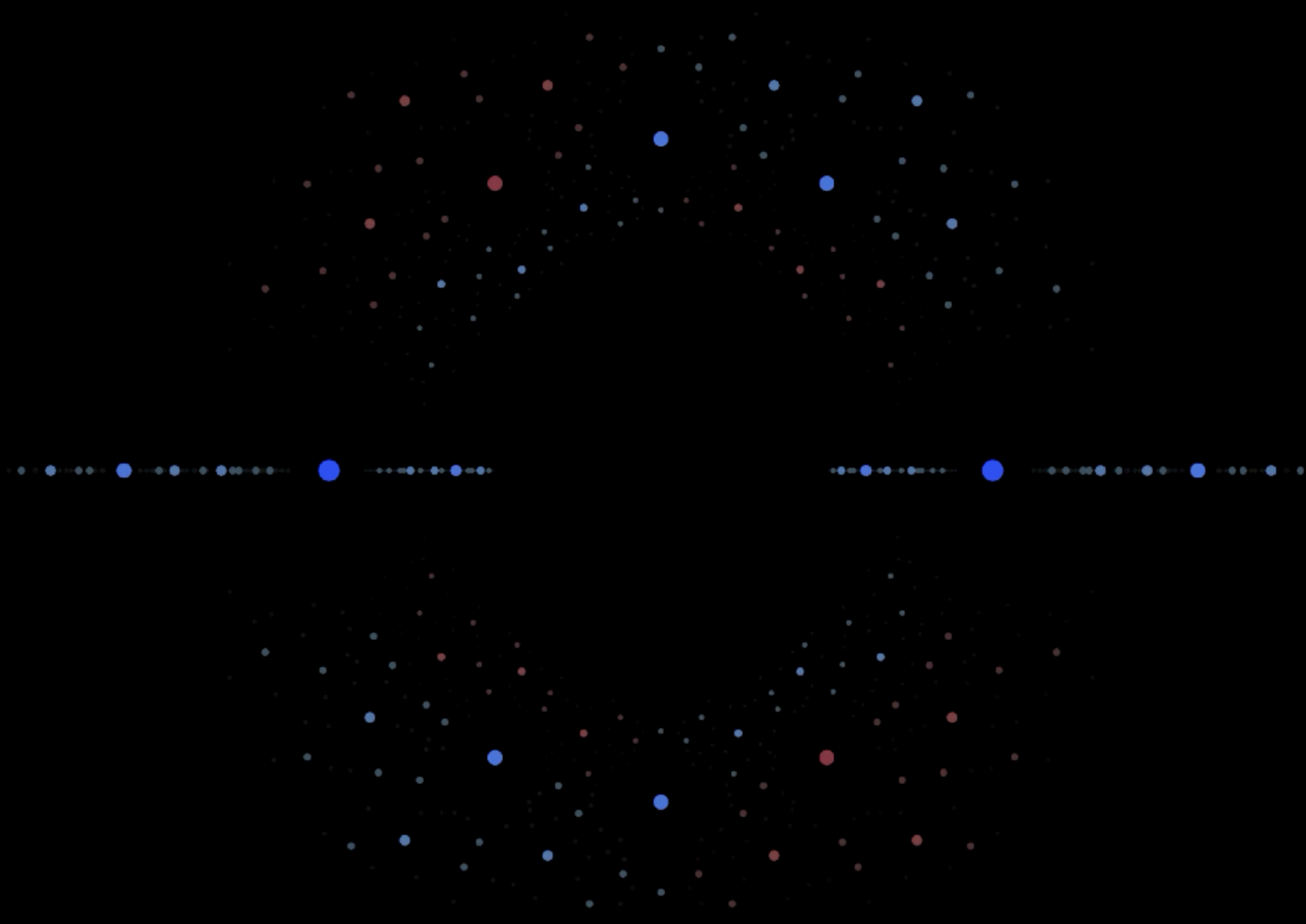


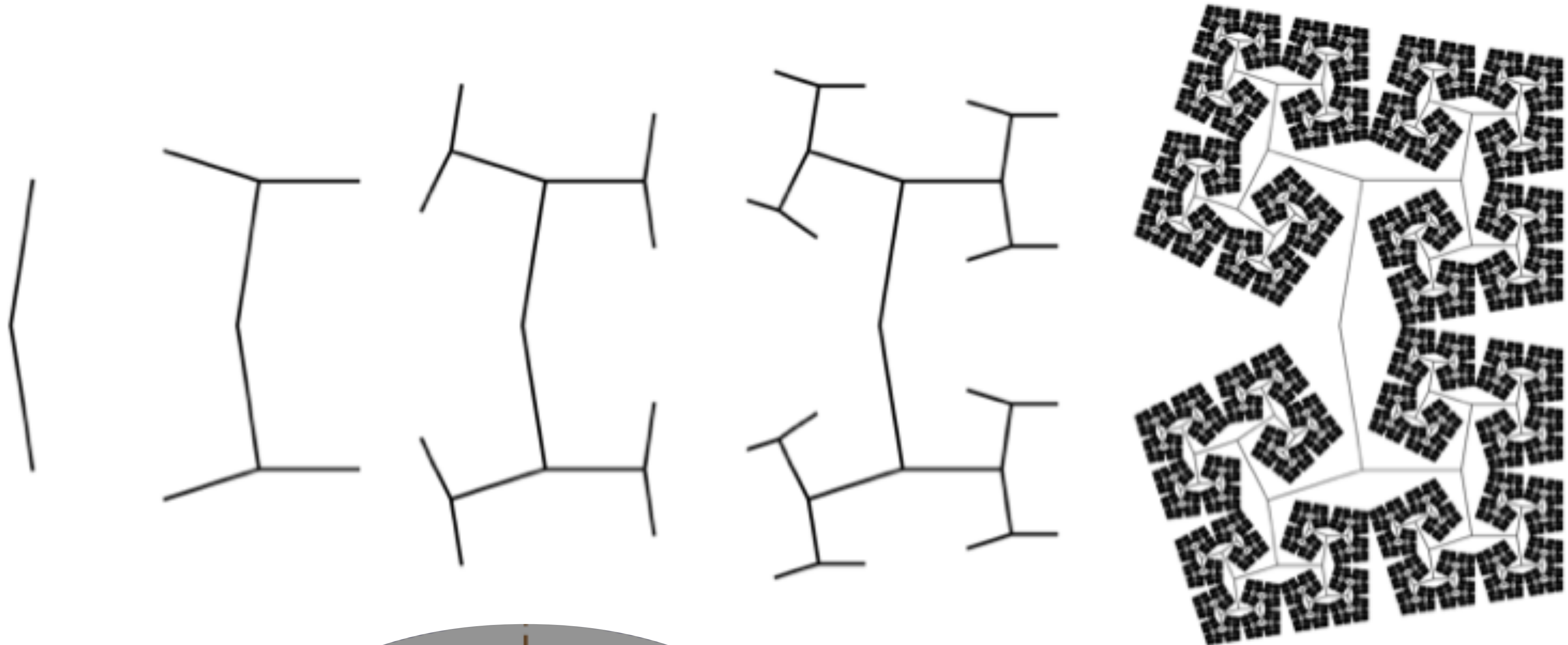
$T\{z, -z\}$



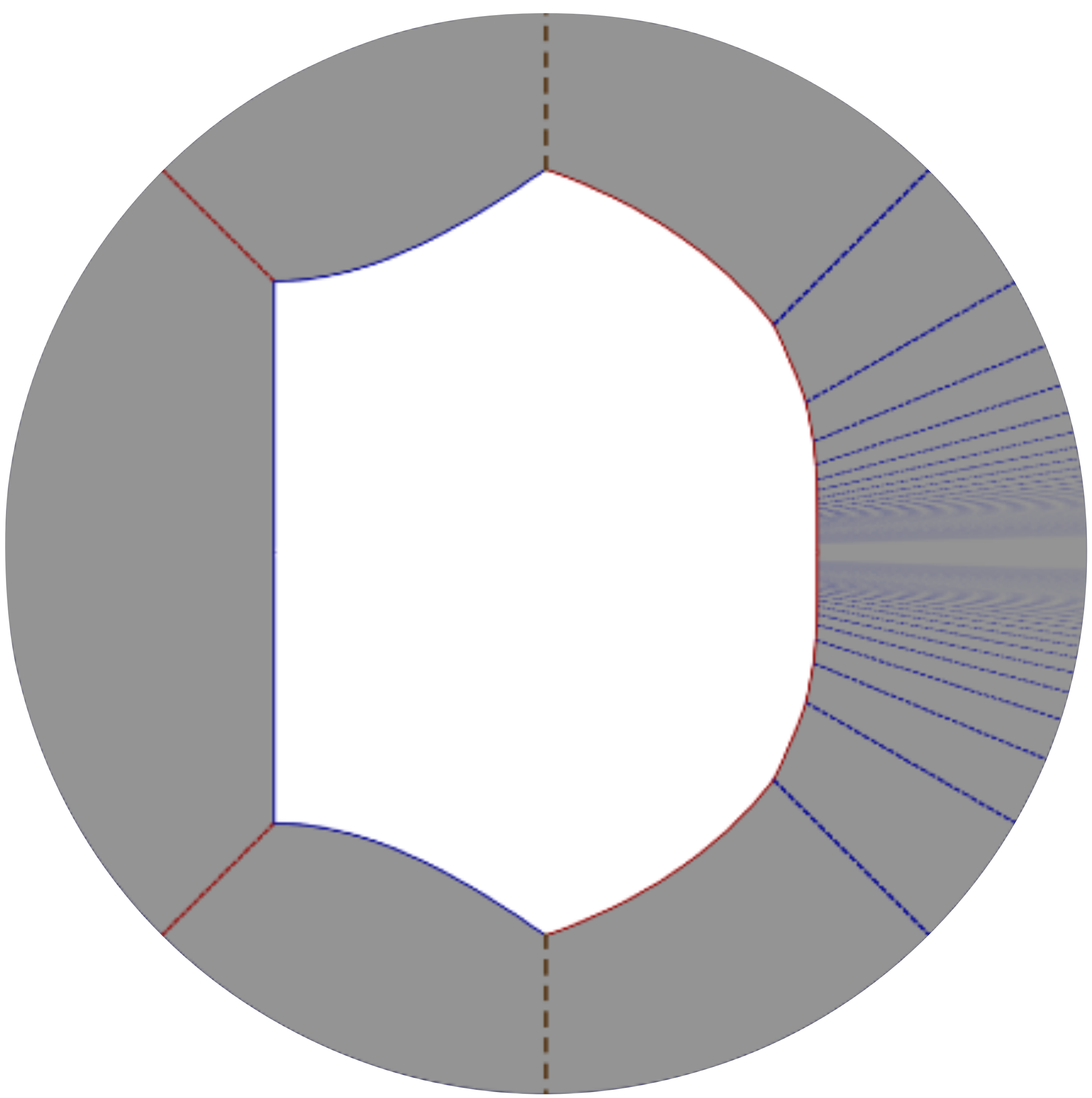
$T\{z, -z^2\}$

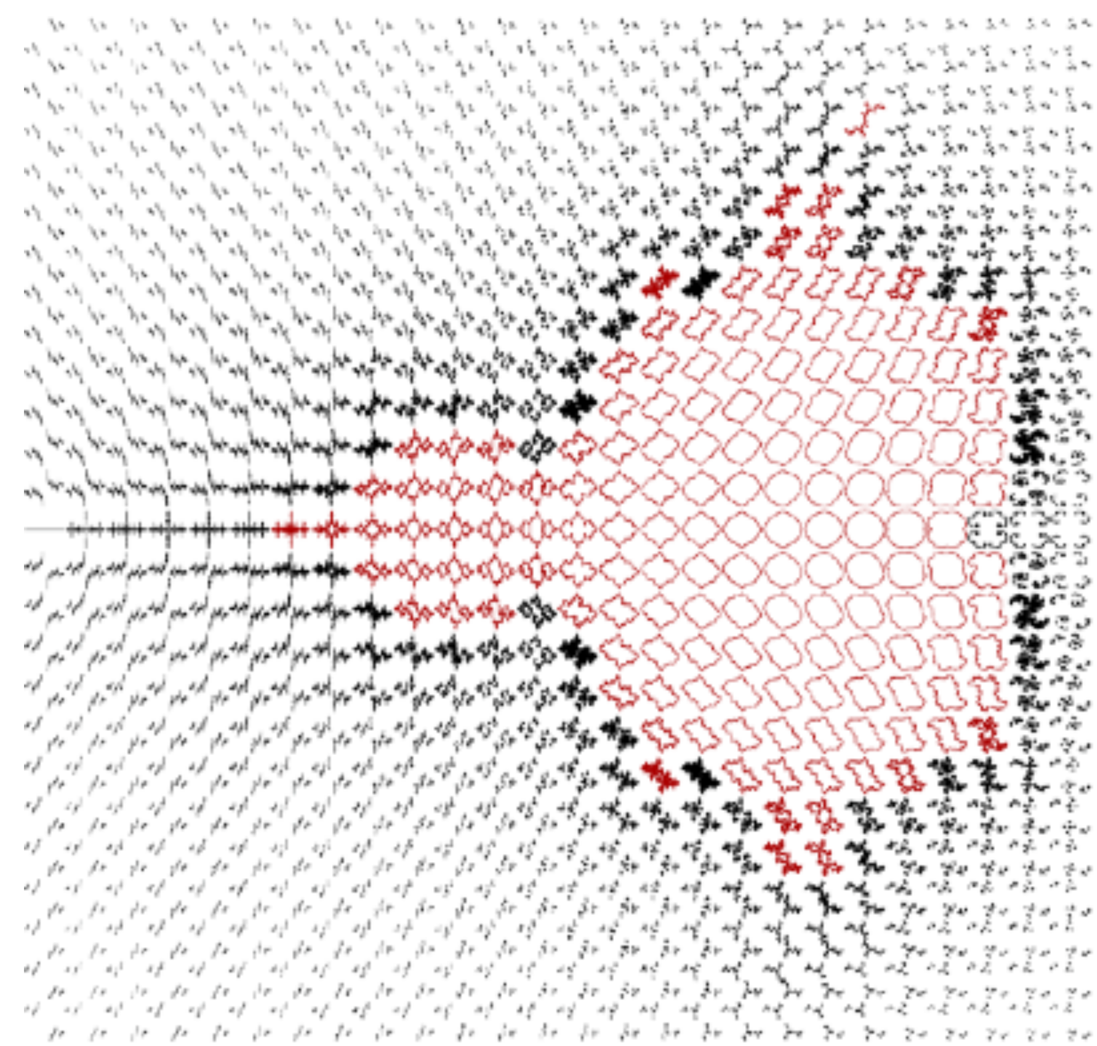


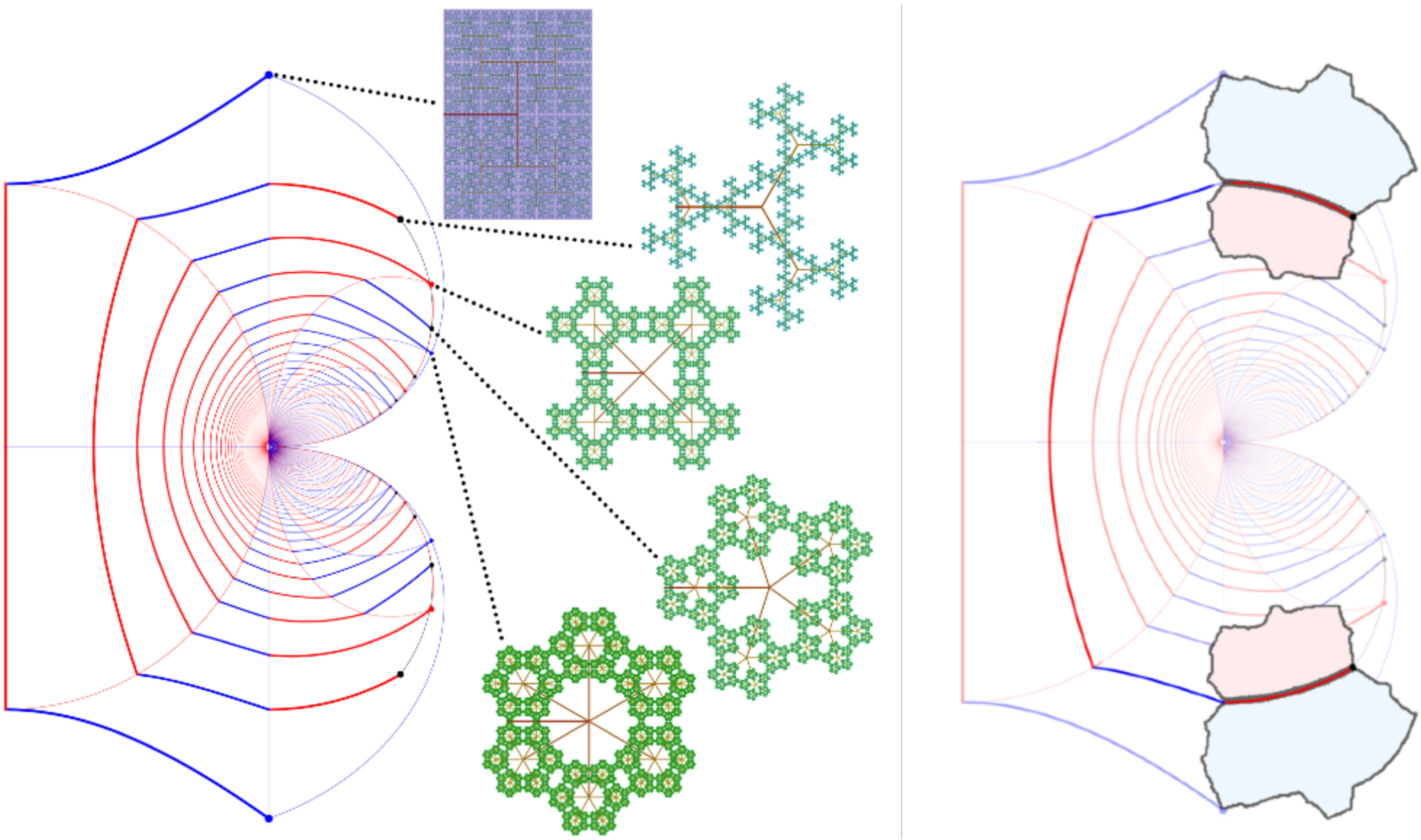


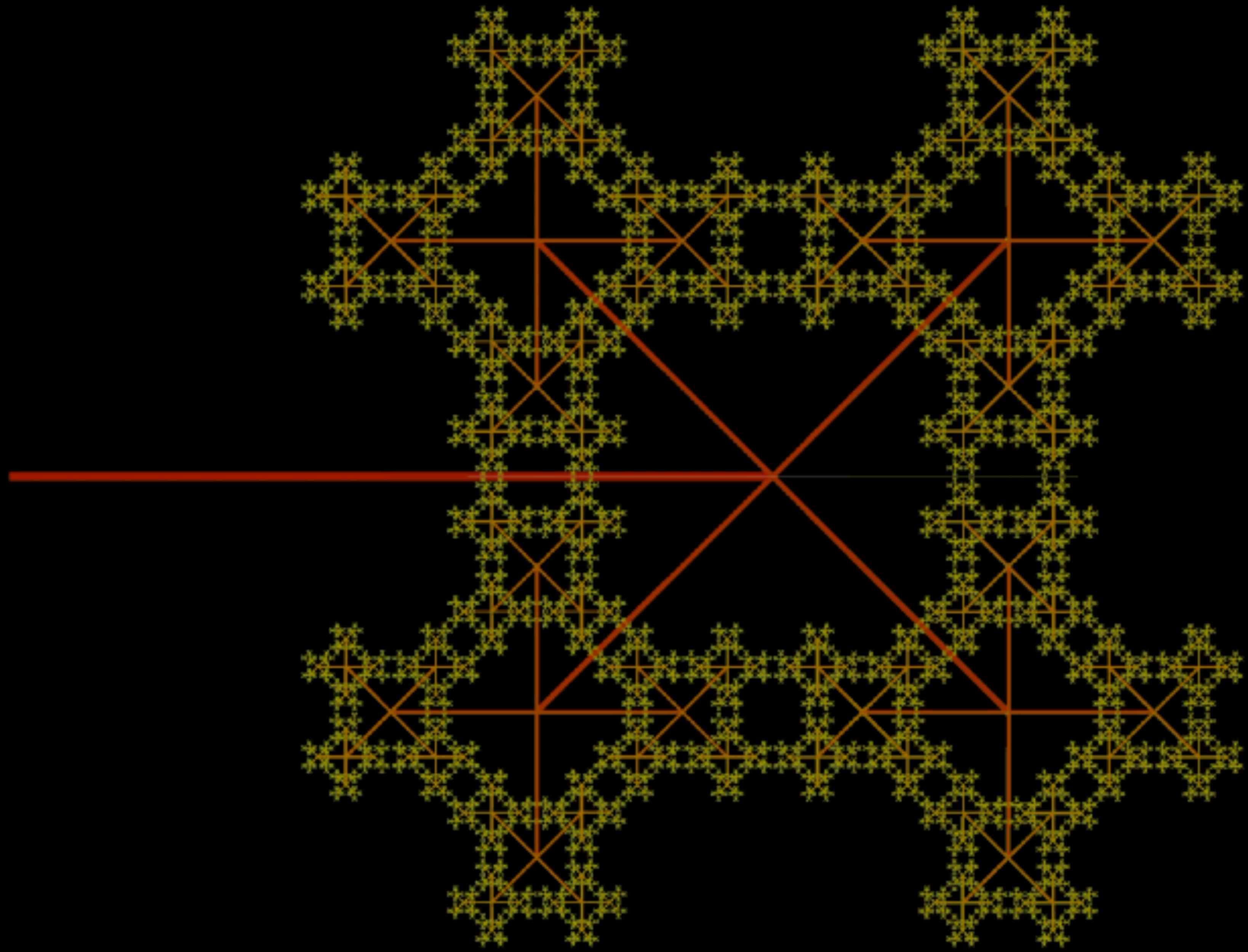


$T\{z, z^*\}$

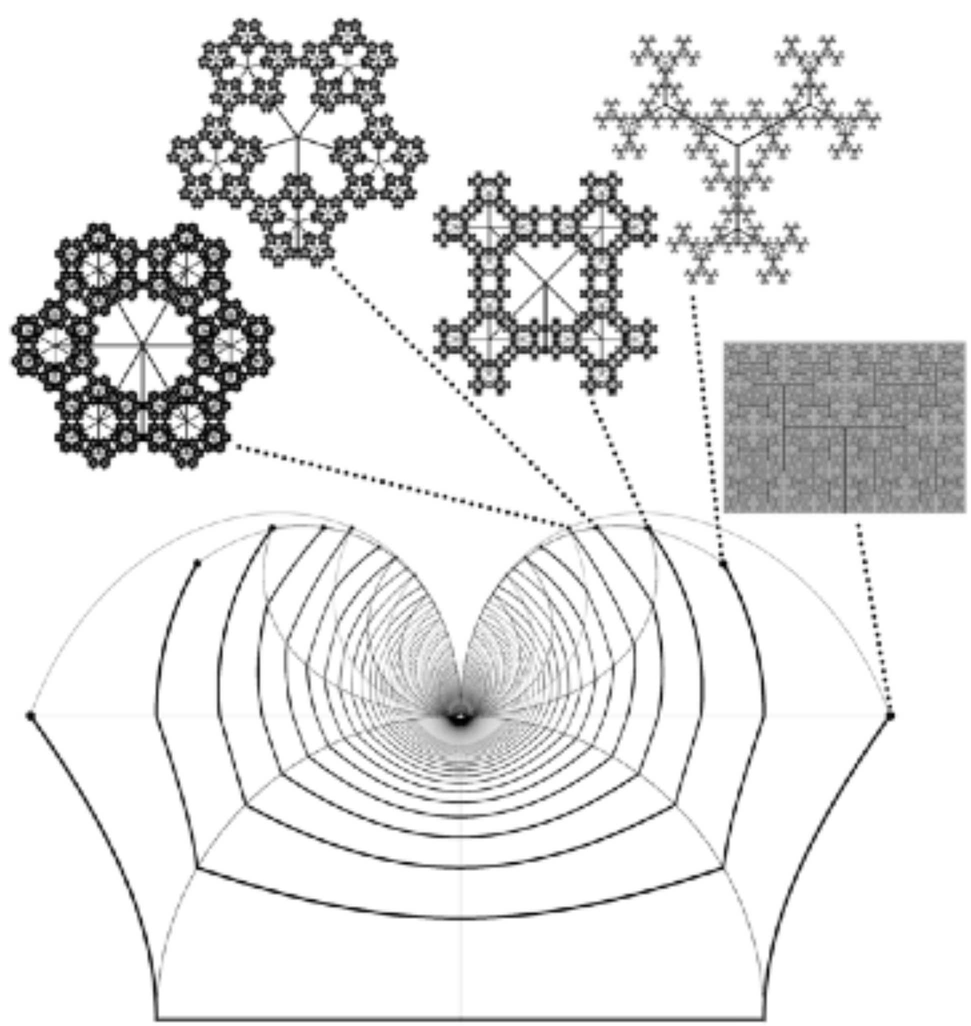


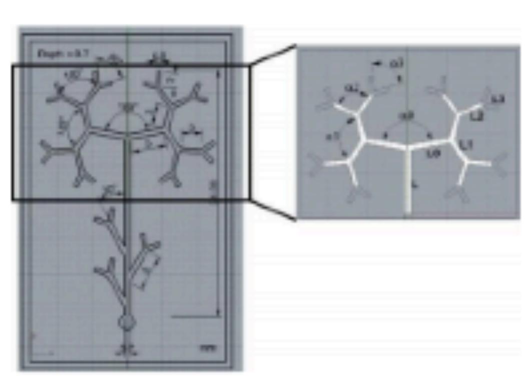


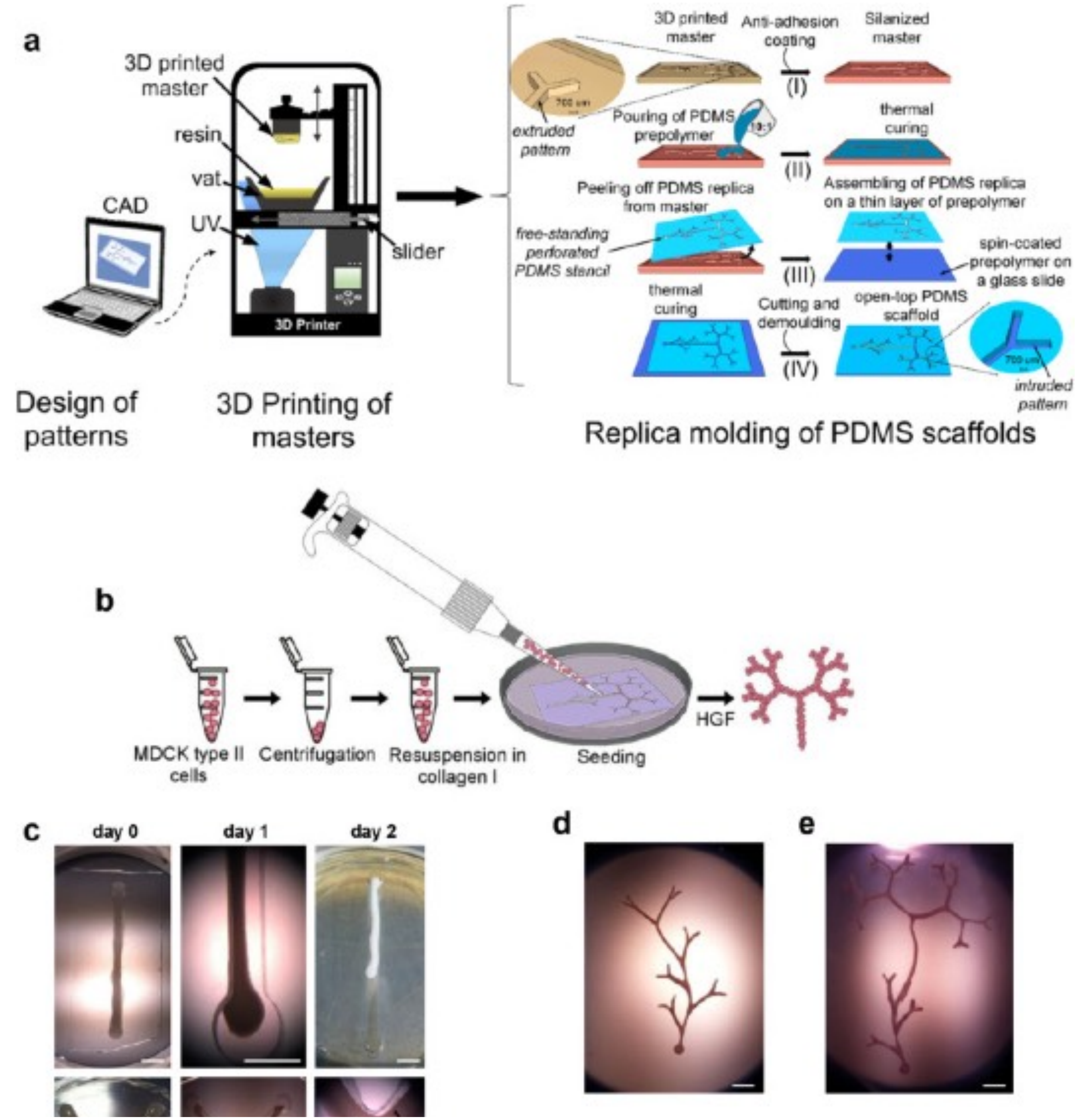




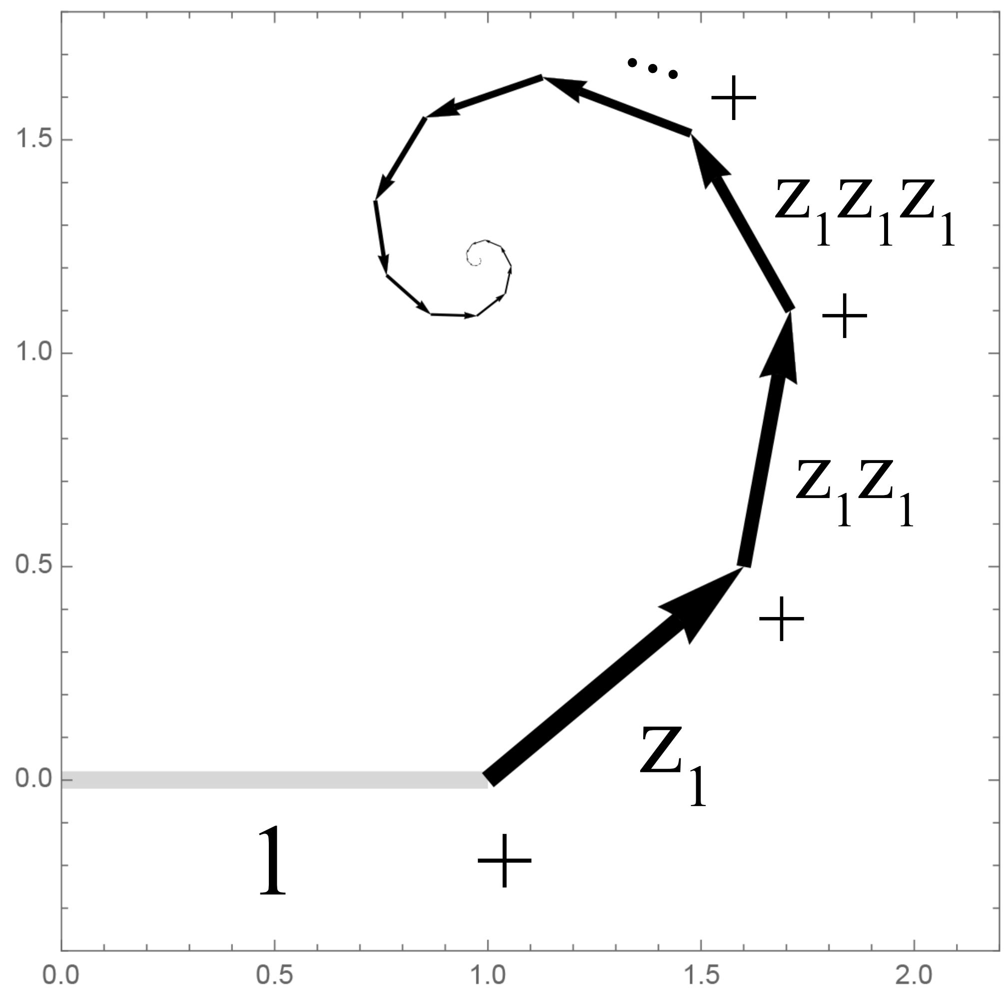
Engineered Kidney Tubules for Modeling Patient-Specific Diseases and Drug Discovery

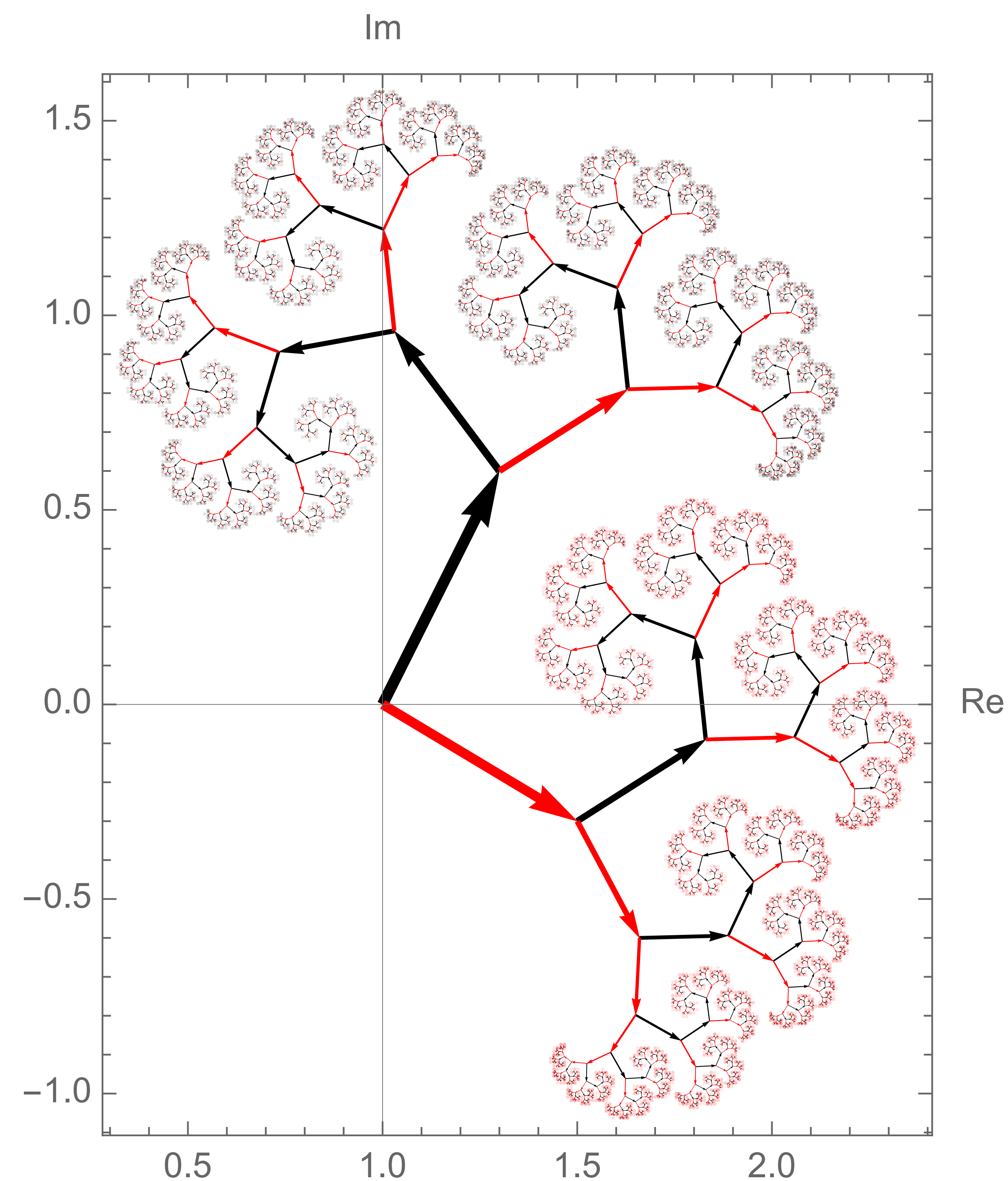






Geometric series ⟶ Complex tree





$$T_A = T\{z_1\} \longrightarrow T_A = T\{c_1, c_2\}$$

n – ary complex tree $T\{c_1, c_2, \ldots, c_n\}$ with $0 < |c_1|, |c_2|, \ldots, |c_n| < 1$

complex-valued alphabet $A = \{c_1, c_2\}$

letters $w_1, w_2, \ldots, w_m \in A = \{1 \to c_1, 2 \to c_2\}$

word $w = w_1 w_2 \ldots w_m$

$$\phi(w) = 1 + w_1 + w_1 w_2 + \ldots + w_1 w_2 \ldots w_m$$

$$\phi(1) = 1 + c_1$$

$$\phi(11) = 1 + c_1 + c_1^2$$

$$\phi(112) = 1 + c_1 + c_1^2 + c_1^2 c_2$$

nodes

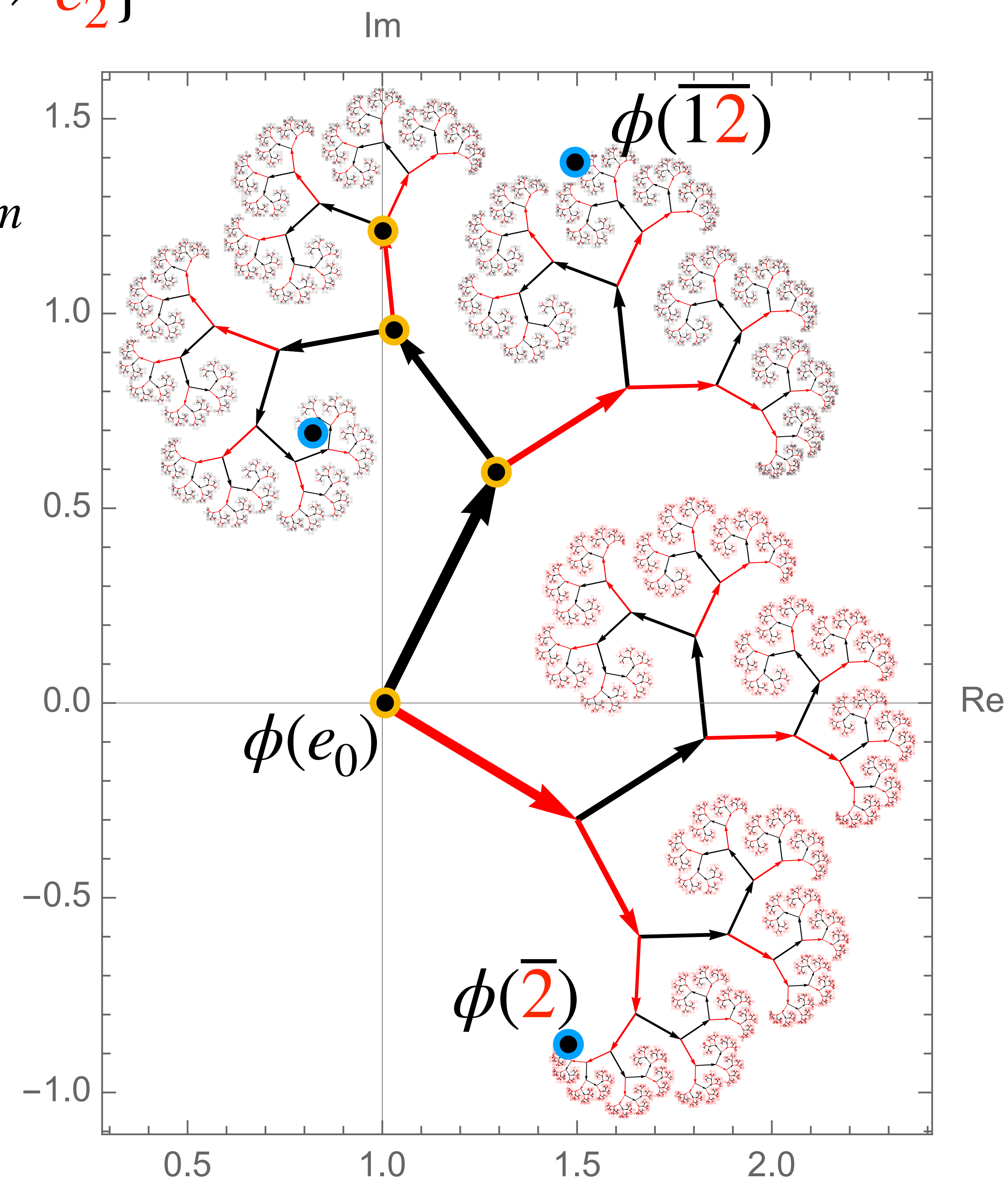
empty string e_0 **root** $\phi(e_0) = 1$

$$w = w_1 w_2 w_3 \ldots w_k \ldots \in \{c_1, c_2\}^\infty = A^\infty$$

tip points $\phi(w)$

$$\phi(111\ldots) = \phi(\overline{1}) = \sum_{k=0}^{\infty} c_1^k = \frac{1}{1 - c_1}$$

$$\phi(121212\ldots) = \phi(\overline{12}) = \frac{1 + c_1}{1 - c_1 c_2}$$

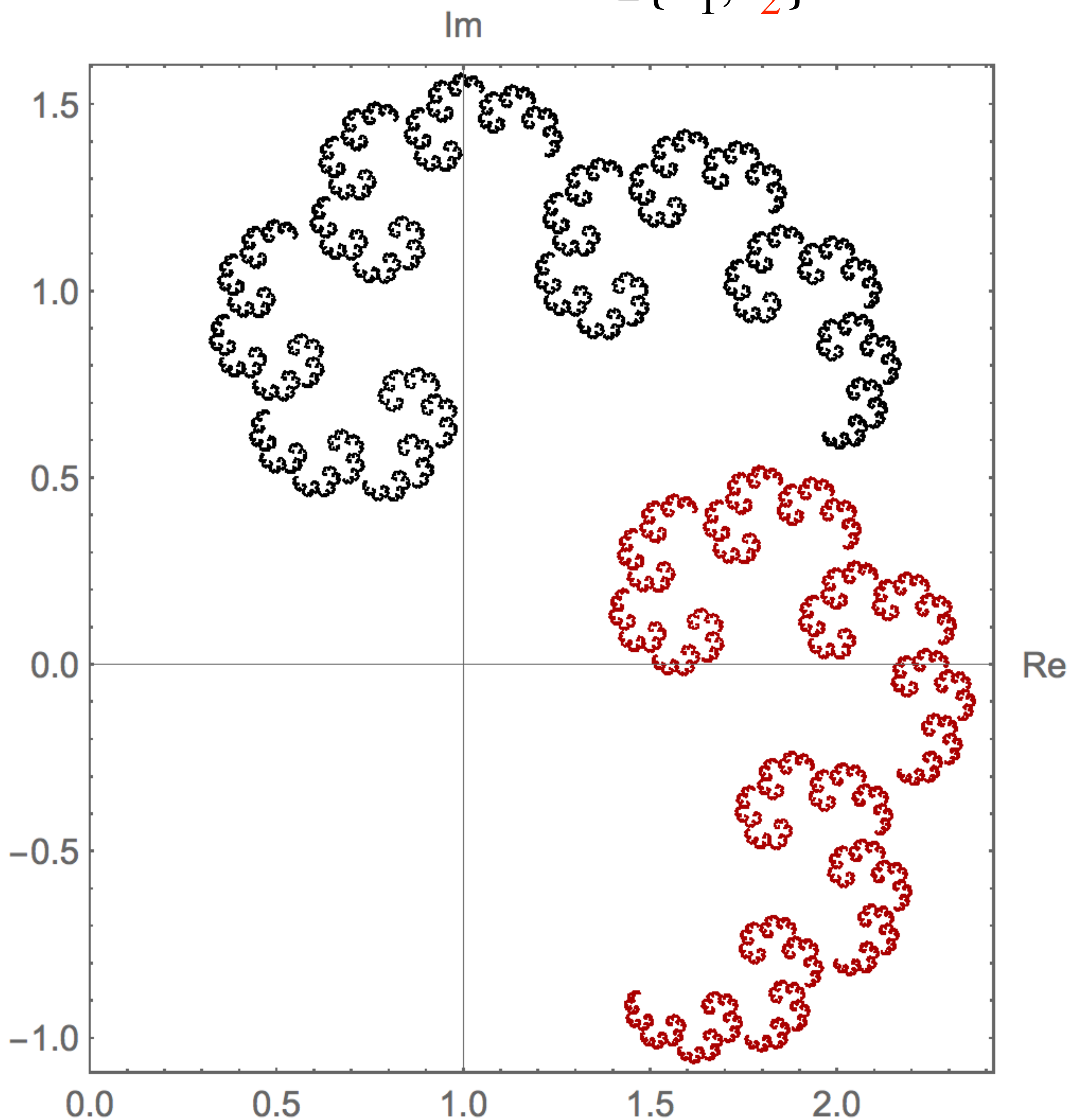


complex tree

$$T_A = T\{c_1, c_2\} = T\{.3 + i.6, .5 - i.3\}$$

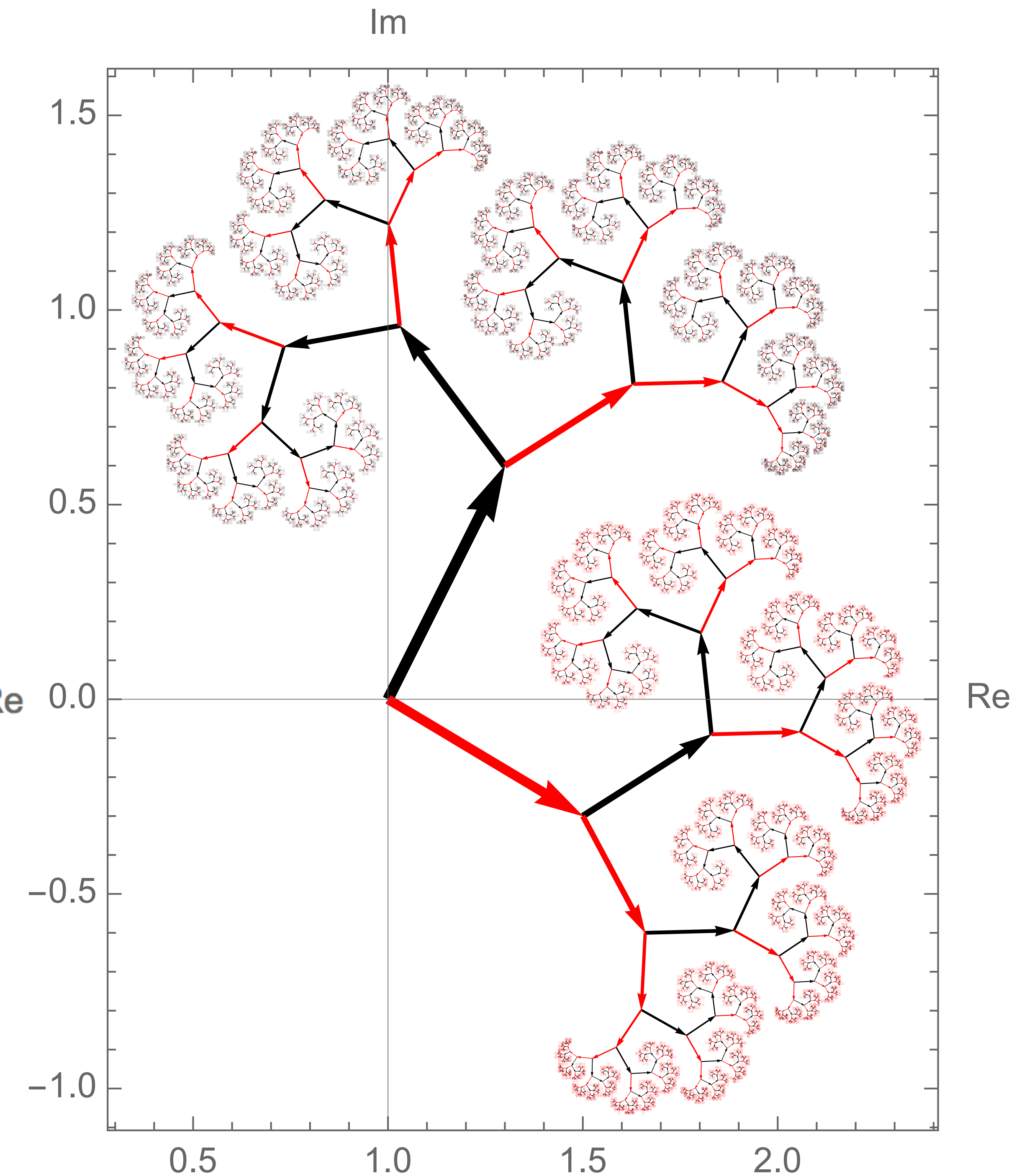
$$F_A = F\{c_1, c_2\} := \bigcup_{w \in \{c_1, c_2\}^\infty} \phi(w)$$

$$\{c_1, c_2\} = \{.3 + i.6,\ .5 - i.3\}$$



tipset

$F\{.3 + i.6,\ .5 - i.3\}$



complex tree

$T\{.3 + i.6,\ .5 - i.3\}$