```
In[•]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\HigherRank"];
        << theta.m
```

```
Loading Rot.m from http://drorbn.net/AP/Projects/HigherRank to compute rotation numbers.
```

```
In[•]:= p = θ[GST48][[2]]
        T1 = T1; T2 = T2;
```

```
In[•]:= Exponent[p, T1, Min]
```

```
Out[•]=
-20
```

```
In[•]:= crs = CoefficientRules[T1^(m1=-Exponent[p,T1,Min]) T2^(m2=-Exponent[p,T2,Min]) p, {T1, T2}]
```

```
In[•]:= max = Max@Abs[Last /@ crs]
```

```
Out[•]=
1056
```

```
In[•]:= CMYKColor[1, 0, 0, 0]
```

```
Out[•]=
```

```
In[•]:= Lighter[Blue, 0.2]
```

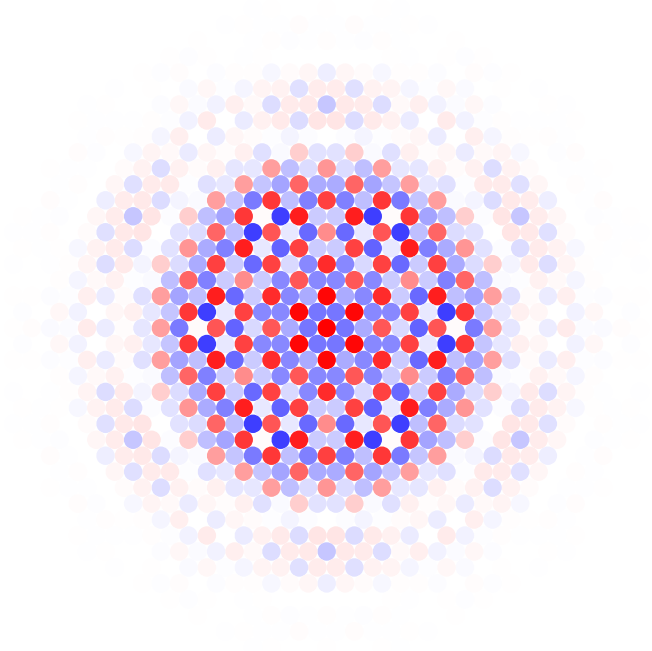
```
Out[•]=
```

```
In[•]:= Lighter[Blue, 0.8]
```

```
Out[•]=
```

```
In[•]:= Graphics[crs /. ({x1_, x2_} → c_) :> {
          Which[c == 0, White, c > 0, Lighter[Red, 1 - c / max], c < 0, Lighter[Blue, 1 + c / max]],
          Disk[({{1, -1/2}, {0, Sqrt[3]/2}}).{x1 + m1, x2 + m2}, 0.5]}]
```

Out[•]=

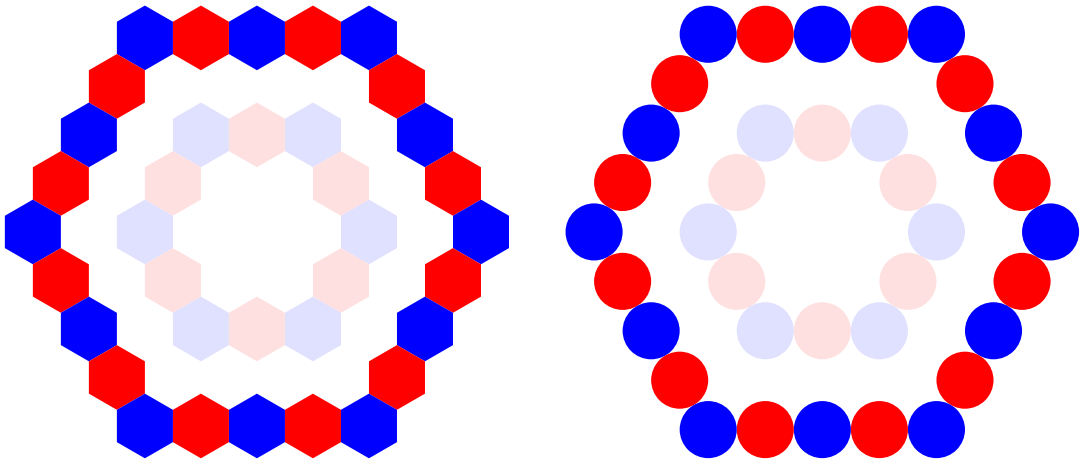


In[•]:=
```
hex = Table[{Cos[α], Sin[α]} / Cos[2 π / 12] / 2, {α, 2 π / 12, 2 π, 2 π / 6}];
PolyPlot__[0] = Graphics[{}];
PolyPlot_T1_,T2_[p_] := PolyPlot_Hexagon,T1,T2[p]
PolyPlot_shape_,T1_,T2_[p_] := Module[{crs, m1, m2, maxc, minc, s},
  crs = CoefficientRules[T1^(m1=-Exponent[p,T1,Min]) T2^(m2=-Exponent[p,T2,Min]) p, {T1, T2}];
  maxc = Max@Abs[Last /@ crs];
  minc = Min@Select[Abs[Last /@ crs], # > 0 &];
  If[minc == maxc,
   s[_] = 0,
   s[c_] := s[c] =
     N[Interpolation[{{Log@minc, 1}, {Log@maxc, 0}}, InterpolationOrder → 1][Log@c]]
  ];
  Graphics[crs /. ({x1_, x2_} → c_) :↦ {
      If[c == 0, White, Lighter[If[c > 0, Red, Blue], 0.88 s[Abs@c]]],
      Switch[shape,
       Disk, Disk[{{1, -1/2}, {0, √3/2}}.{x1 + m1, x2 + m2}, 0.5],
       Hexagon, Polygon[({{1, -1/2}, {0, √3/2}}.{x1 + m1, x2 + m2} + #) & /@ hex]
      ]
     }]
 ]
```

In[•]:=
```
GraphicsRow[{PolyPlot_Hexagon,T1,T2[⊖[Knot[5, 1]][[2]]], PolyPlot_Disk,T1,T2[⊖[Knot[5, 1]][[2]]]}]
```

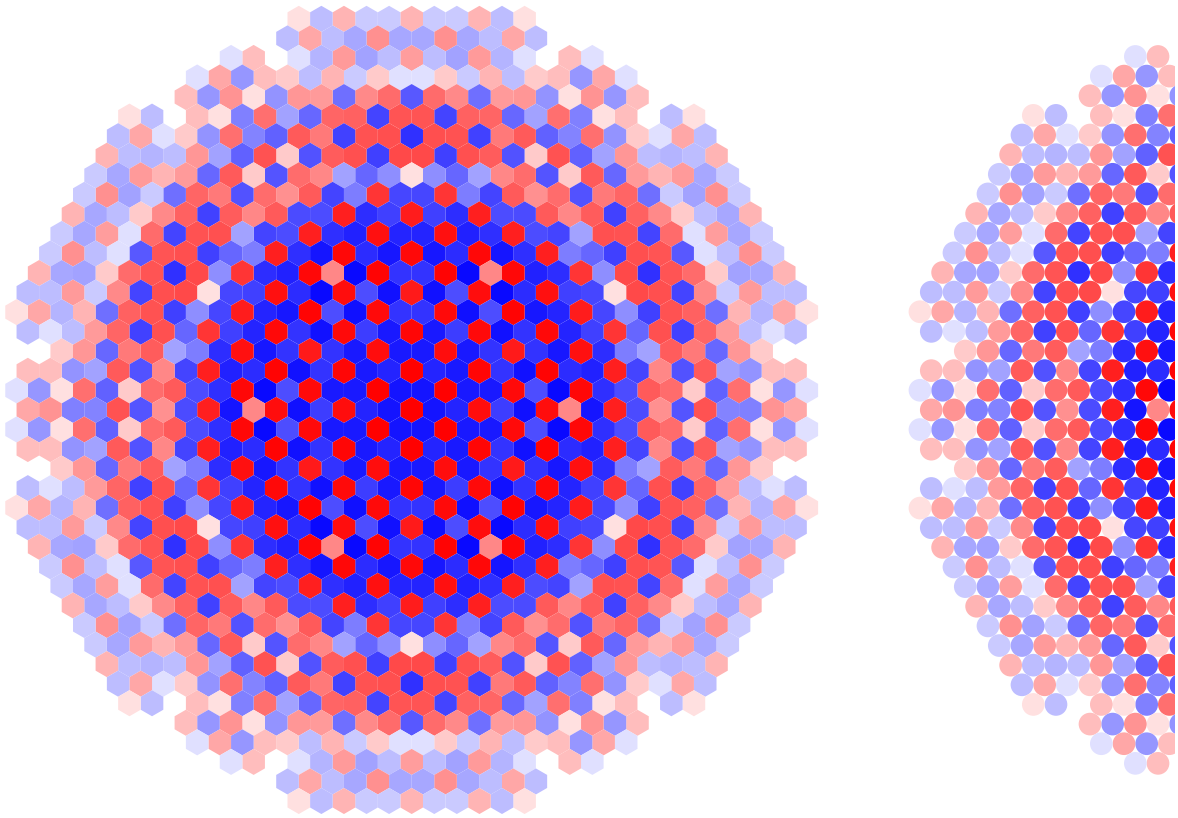
KnotTheory: Loading precomputed data in PD4Knots`.

Out[•]=



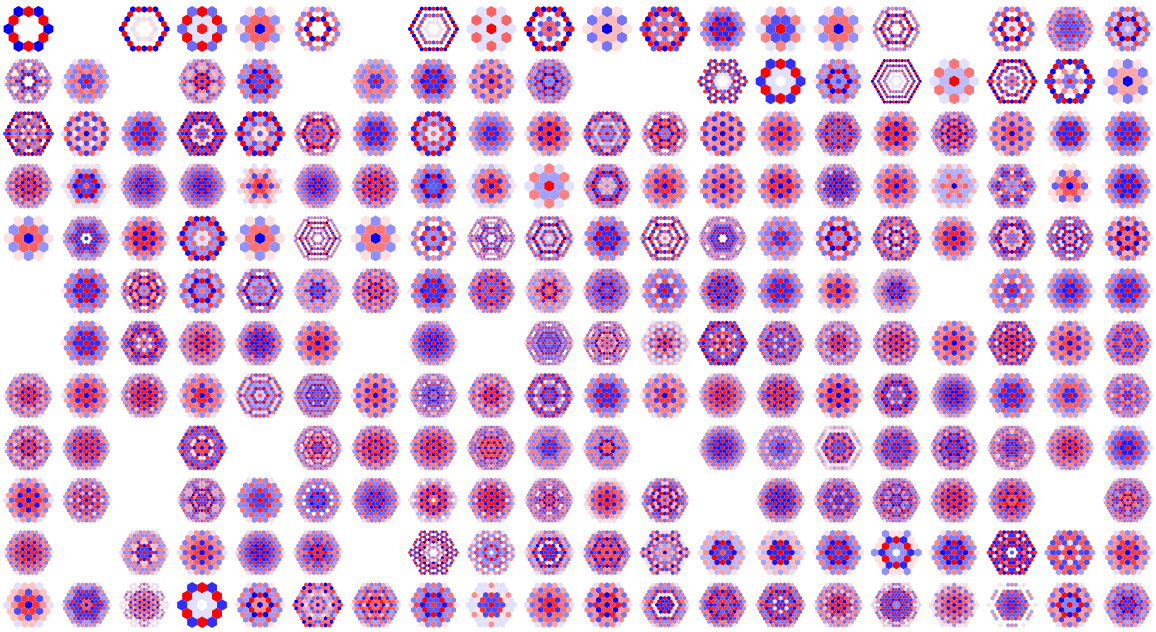
In[•]:=
```
θ48 = θ[GST48][[2]]; GraphicsRow[{PolyPlot_{Hexagon,T1,T2}[θ48], PolyPlot_{Disk,T1,T2}[θ48]}]
```

Out[•]=



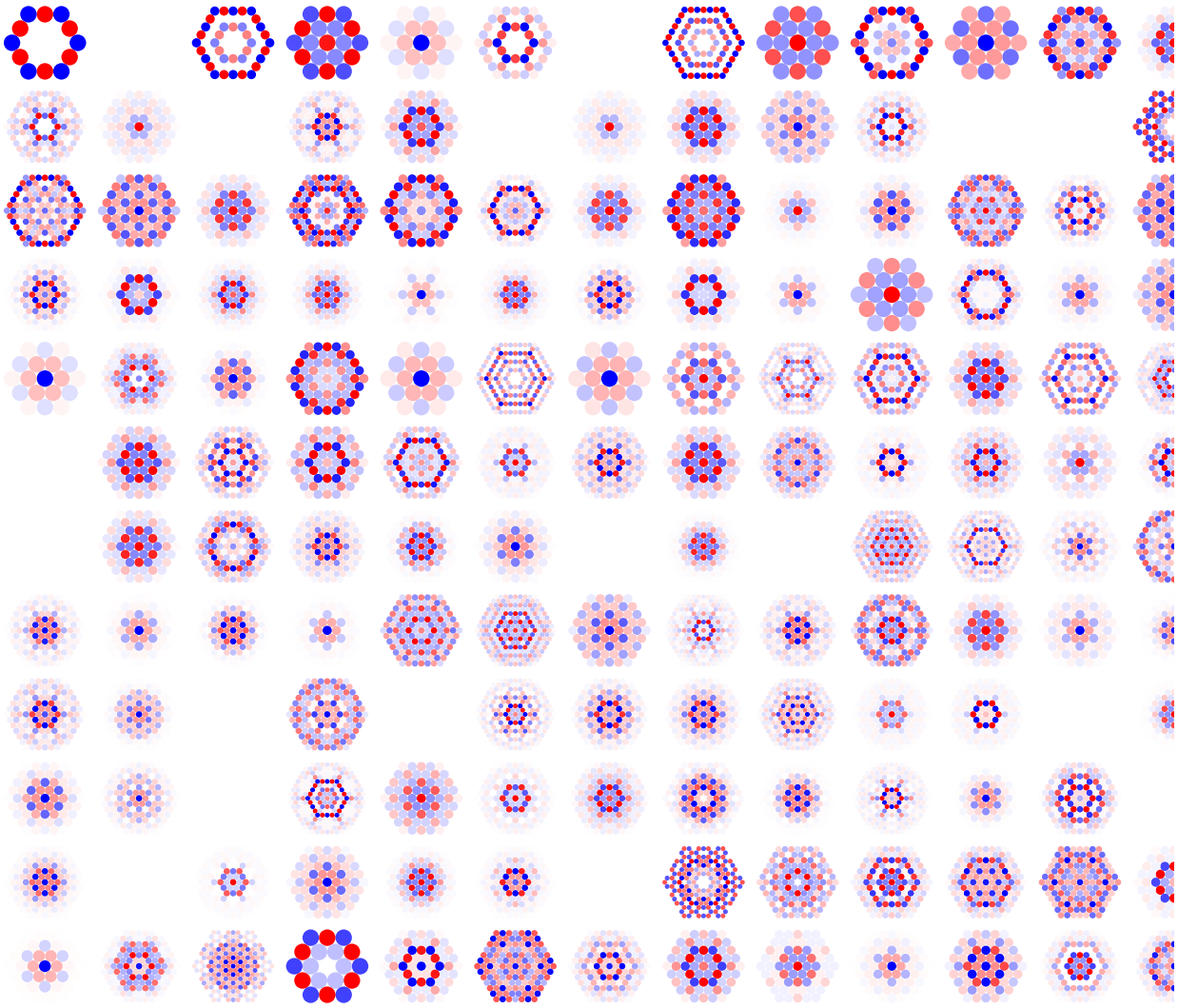
In[•]:=
```
GraphicsGrid[Partition[Table[PolyPlot_{Hexagon,T_1,T_2}[θ[K][[2]]], {K, AllKnots[{3, 10}]}], 20]]
```

Out[•]=



```
In[•]:= GraphicsGrid[Partition[Table[PolyPlot_{Disk,T_1,T_2}[θ[K][[2]]], {K, AllKnots[{3, 10}]}], 20]]
```

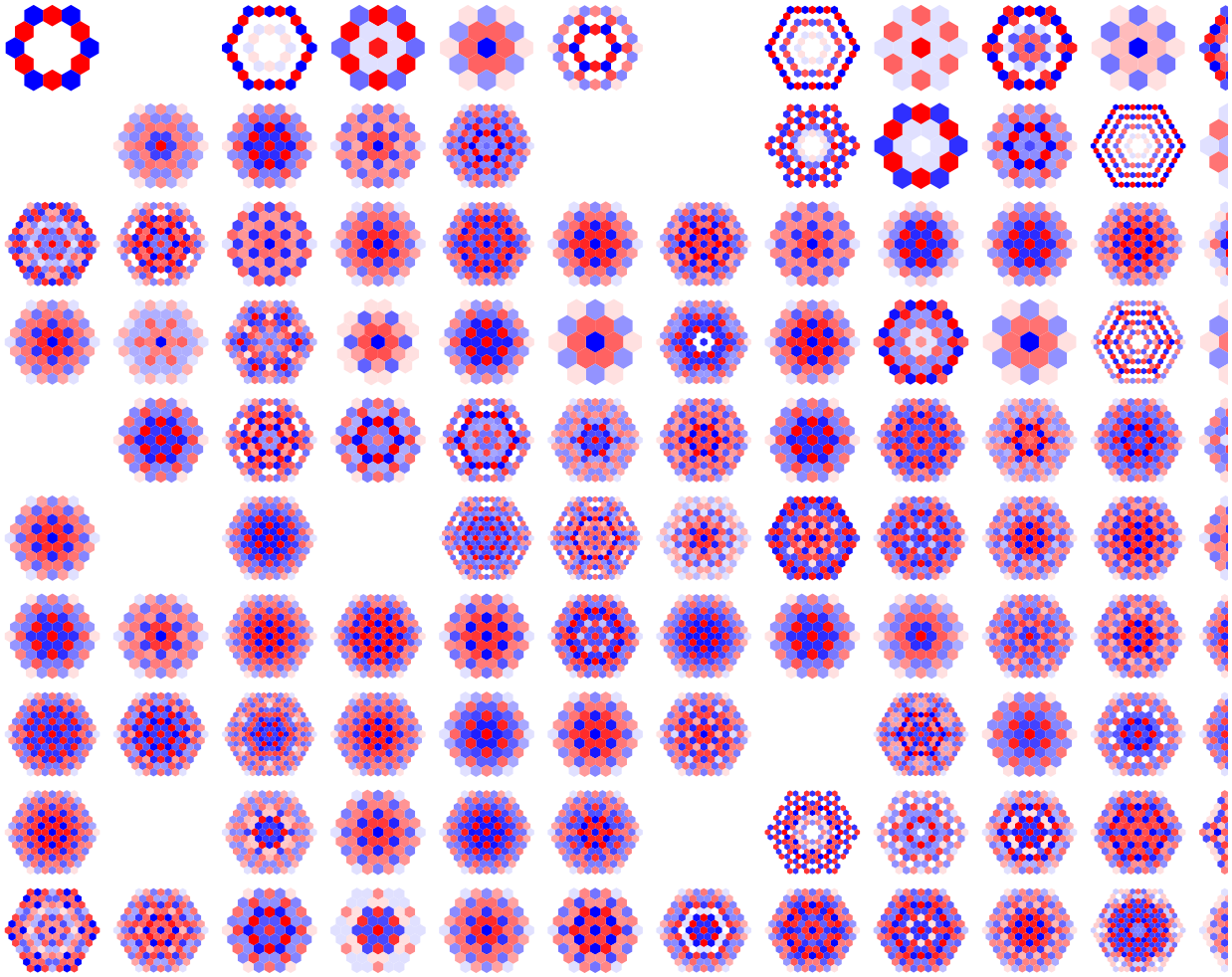
Out[•]=



```
In[•]:= tab250 = Table[θ[K][[2]], {K, AllKnots[{3, 10}]}]~Join~{0};
```

In[•]:=
```
g250 = GraphicsGrid[Partition[PolyPlot_{Hexagon,T_1,T_2} /@ tab250, 25]]
```

Out[•]=



In[•]:=
```
Export["g250.png", g250, ImageSize → 2400]
```

Out[•]=

g250.png

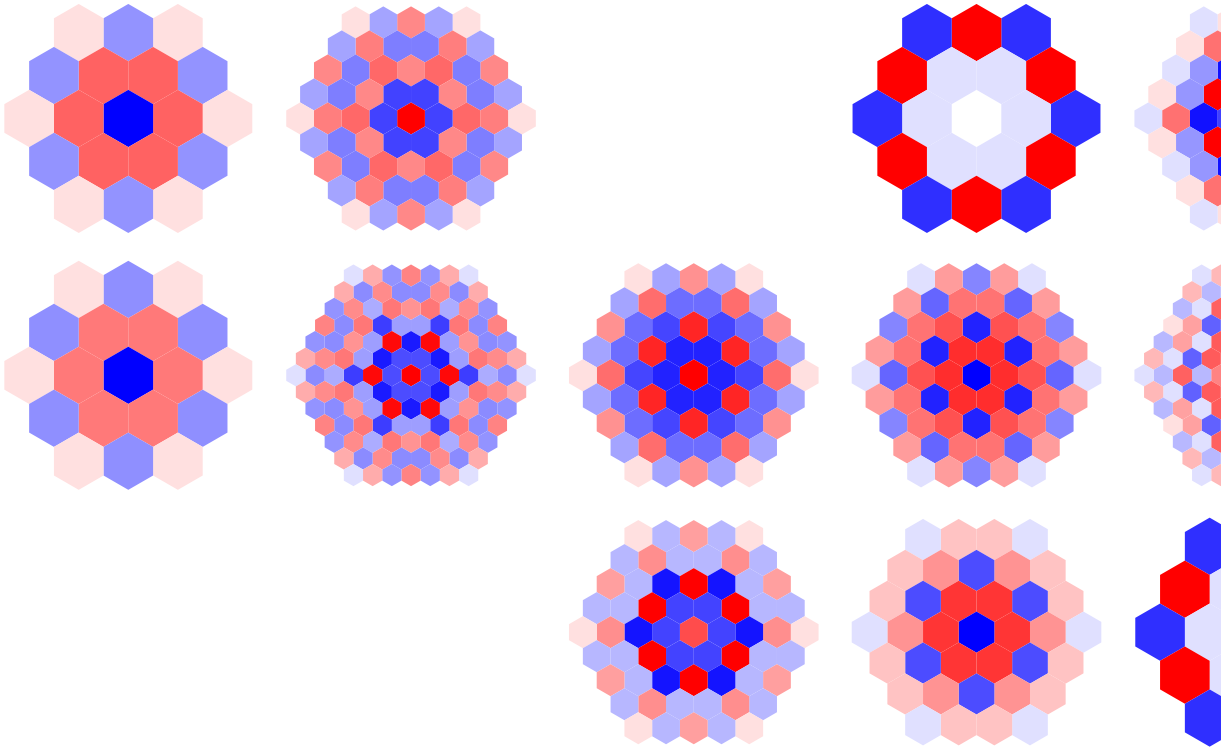
In[•]:=
```
Length[
 ribbs = Table[θ[K][[2]], {K, {Knot[6, 1], Knot[8, 8], Knot[8, 9], Knot[8, 20], Knot[9, 27],
     Knot[9, 41], Knot[9, 46], Knot[10, 3], Knot[10, 22], Knot[10, 35], Knot[10, 42],
     Knot[10, 48], Knot[10, 75], Knot[10, 87], Knot[10, 99], Knot[10, 123],
     Knot[10, 129], Knot[10, 137], Knot[10, 140], Knot[10, 153], Knot[10, 155]}}]]
```

Out[•]=

21

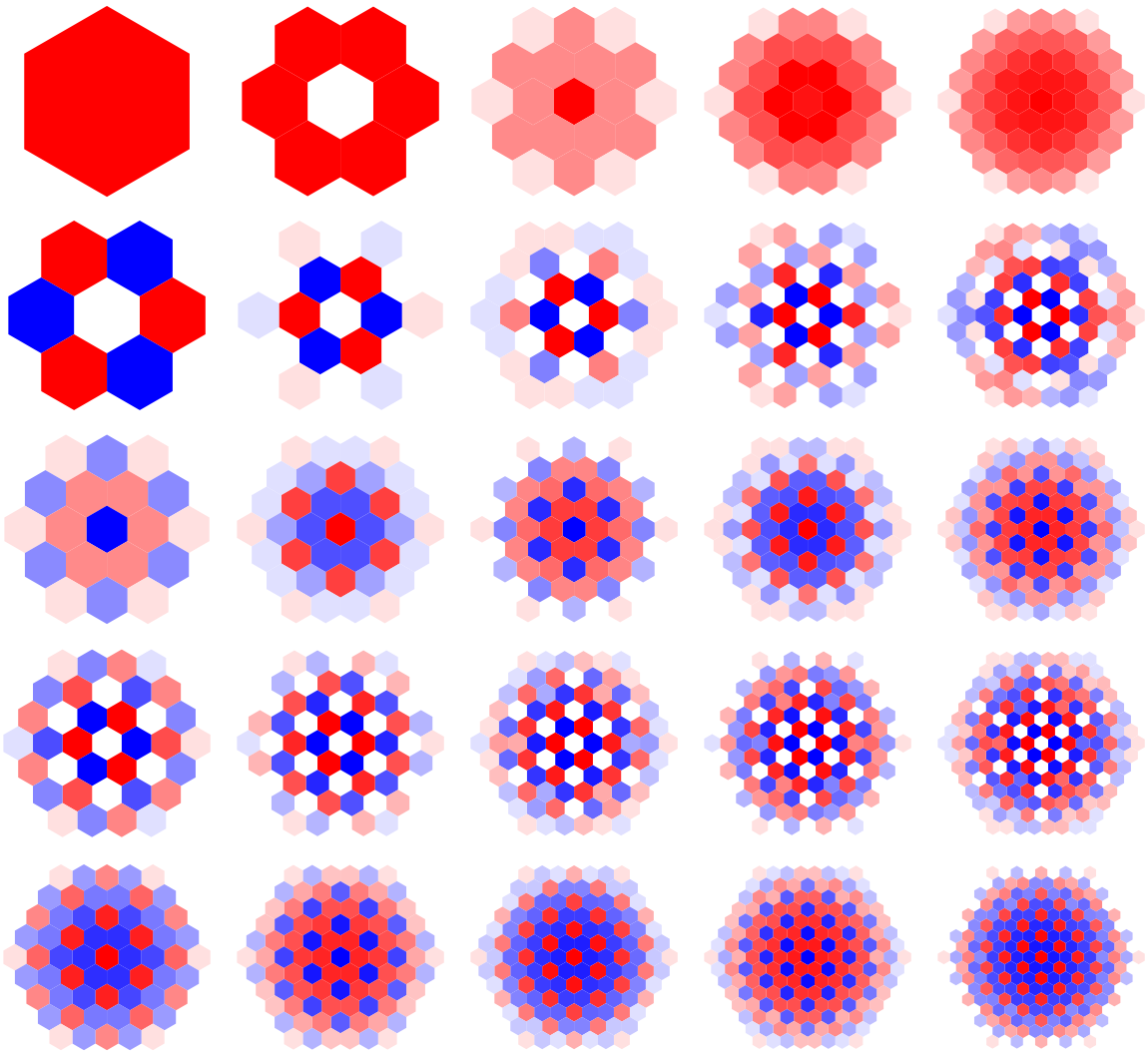
```
In[•]:= GraphicsGrid[Partition[PolyPlot_{Hexagon,T_1,T_2} /@ ribbs, 7]]
```

Out[•]=



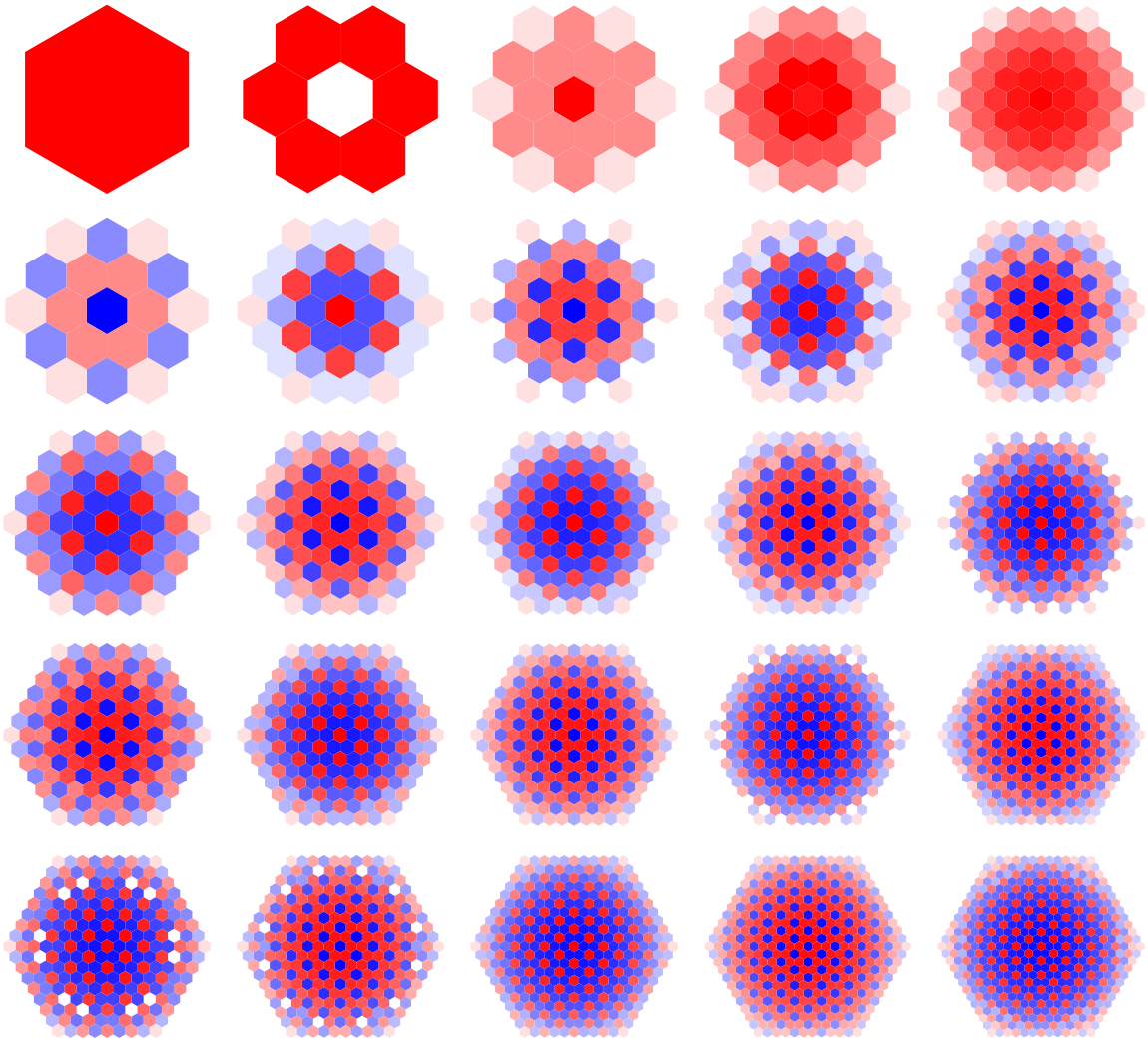
```
In[•]:= w = T1 + T2 + T3 + T1^-1 + T2^-1 + T3^-1; (* T1(1+T2) *)
        z = T1 + T2 - T3 - T1^-1 - T2^-1 + T3^-1; (* T1(1-T2) *)
        GraphicsGrid@Table[PolyPlot_{Hexagon,T1,T2}[z^i w^j], {i, 0, 4}, {j, 0, 4}]
```

Out[•]=



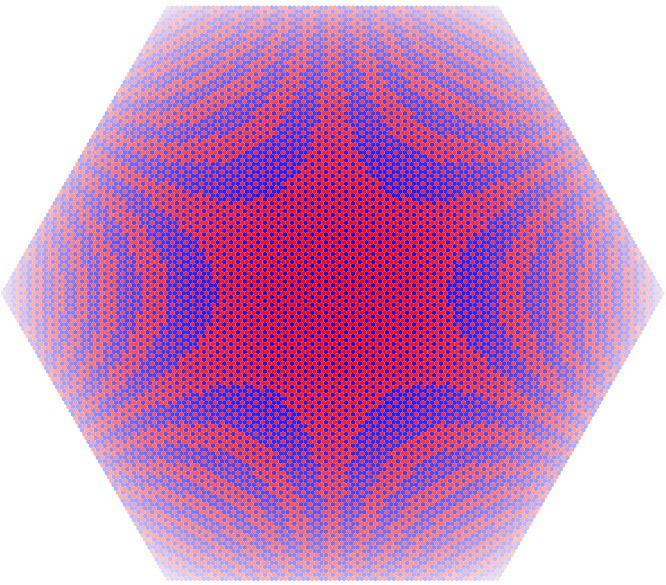
In[•]:=
```
GraphicsGrid@Table[PolyPlot_{Hexagon,T_1,T_2}[z^(2 i) w^j], {i, 0, 4}, {j, 0, 4}]
```

Out[•]=



In[•]:=
```
PolyPlot_{Hexagon,T_1,T_2}[z^40 w^33]
```

Out[•]=



In[•]:=
```
PolyPlot_{Hexagon,T_1,T_2}[(Theta4DK240 = θ[DK[240]])[[2]]]
```

In[•]:=
```
Put[Theta4DK240, "Theta4DK240.m"]
```

In[•]:=
```
PolyPlot_{Hexagon,T_1,T_2}[θ[DK[250]][[2]]]
```