```
(* ( WQ,  FS 2013, nb zu Compile *)


ApfelCalc[z0_Complex, nmax_Integer] := Module[{n = 0, z = 0},
  While[Abs[z] < 2 && n < nmax,  z = z^2 + z0; n++];
  n]

ApfelCalc[1 + 0.1 I , 50]
```

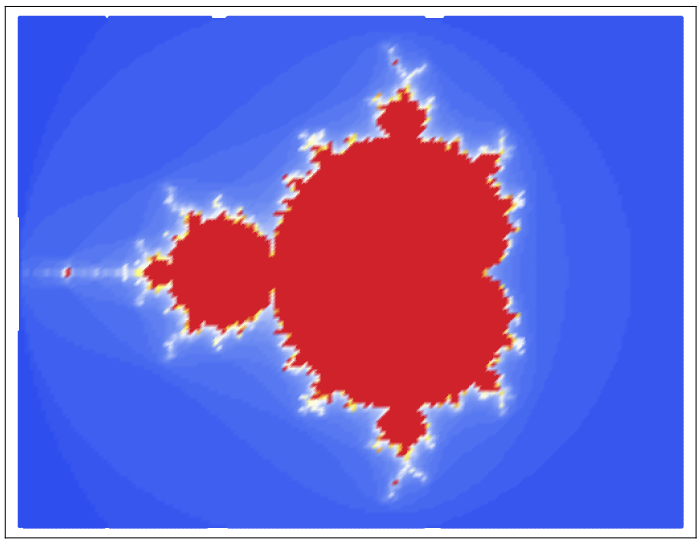
2

In[6]:=
```
c = ColorData["TemperatureMap"]
```

Out[6]= ColorDataFunction[{0, 1}, ]

```
ApfelPlot[z0_Complex, z1_Complex, nmax_Integer, dx_Real] :=
 Module[{r0 = Re[z0], r1 = Re[z1], i0 = Im[z0], i1 = Im[z1]},
  ListDensityPlot[Table[ApfelCalc[r + j I , nmax], {j, i0, i1, dx}, {r, r0, r1, dx}],
   AspectRatio -> (i1 - i0) / (r1 - r0), FrameTicks → None, ColorFunction → c]]

ApfelPlot[-2 - 1.25 I, 1.25 + 1.25 I, 50, 0.02]
```

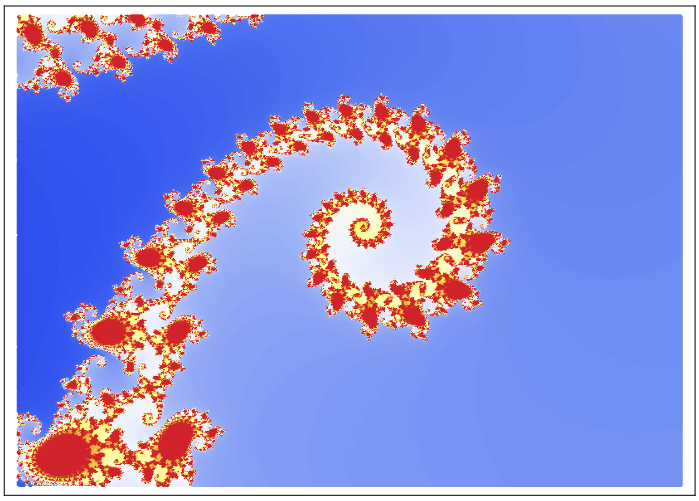


```
(* nun mit Compile *)
```

In[2]:=
```
ApfelCalcC = Compile[{{z0, _Complex}, {nmax, _Integer}}, Module[{n = 0, z = 0. I},
     While[Abs[z] < 2 && n < nmax,  z = z^2 + z0; n++]; n]];
```

In[3]:=
```
ApfelPlotC[z0_Complex, z1_Complex, nmax_Integer, dx_Real] :=
 Module[{r0 = Re[z0], r1 = Re[z1], i0 = Im[z0], i1 = Im[z1]}, ListDensityPlot[
   Table[ApfelCalcC[r + j I , nmax], {j, i0, i1, dx}, {r, r0, r1, dx}],
   AspectRatio -> (i1 - i0) / (r1 - r0), FrameTicks → None, ColorFunction → c]]
```

```
ApfelPlotC[-0.7476 + 0.0976 I, -0.7452 + 0.0993 I, 200, 0.3 * 10^(-5)]
```

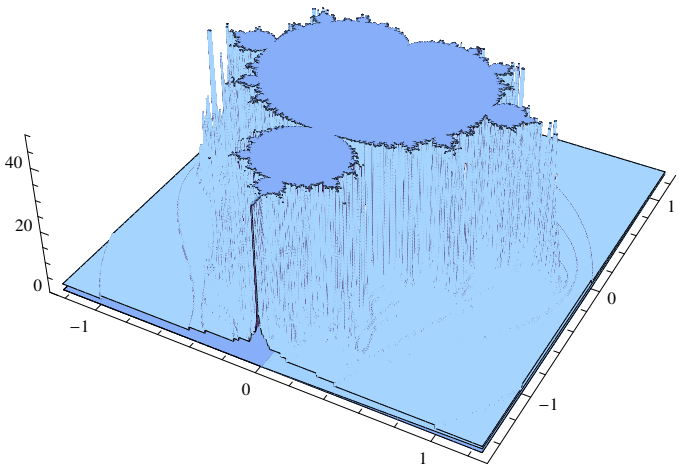


```
(* Ein nicht sehr gegluckter Versuch ein Profil zu erstellen *)
```

```
ApfelPlotC3D[z0_Complex, z1_Complex, nmax_Integer] :=
 Module[{r0 = Re[z0], r1 = Re[z1], i0 = Im[z0], i1 = Im[z1]},
  Plot3D[{j, r, ApfelCalcC[r + j  I , nmax]}, {j, i0, i1}, {r, r0, r1},
   PlotPoints → 200, PlotRange → {0, 50}, Mesh → False, Boxed → False]]
```

```
ApfelPlotC3D[-1.5 - 1.25 I, 1.25 + 1.25 I, 200]
```

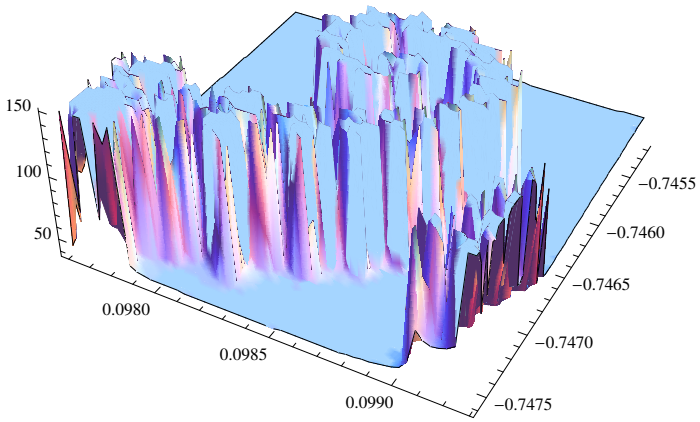
CompiledFunction::cfsa : Argument i j + r at position 1 should be a machine−size complex number. ≫




```
z0 = -0.7476 + 0.0976 I; z1 = -0.7452 + 0.0993 I;
r0 = Re[z0]; r1 = Re[z1]; i0 = Im[z0]; i1 = Im[z1];
dx = 0.3 * 10^(-4);
```

```
frac = Flatten[
   Table[{j, r, ApfelCalcC[r + j I , 150]}, {j, i0, i1, dx}, {r, r0, r1, dx}], 1];
```

```
ListPlot3D[frac, Mesh → False, Boxed → False]
```




```
(* Und nun von einem Profi (zitiert nach H.-G.Gräbe) *)

ReliefApfelPlot[z0_Complex, z1_Complex, nmax_Integer, dx_Real] :=
Module[{r0 = Re[z0], r1 = Re[z1], i0 = Im[z0], i1 = Im[z1]},
  ReliefPlot[Table[ApfelCalcC[r + I i, nmax], {i, i0, i1, dx}, {r, r0, r1, dx}],
    AspectRatio -> (i1 - i0)/(r1 - r0), FrameTicks → None, ColorFunction → c]]
```

In[7]:=
```
g = ReliefApfelPlot[-0.7476 + 0.0976 I, -0.7452 + 0.0993 I, 200, .3 × 10^-5]
```

Out[7]=