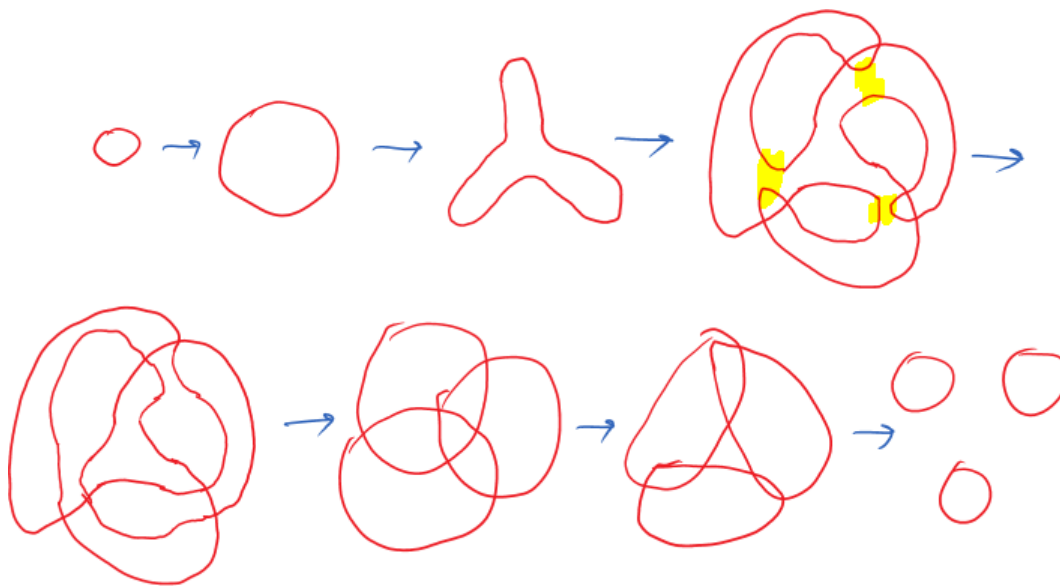


Pensieve header: The Boy surface in the Bryant-Kusner parametrization, following http://en.wikipedia.org/wiki/Boy%27s_surface. Continues pensieve://2008-05/.



$$z = r e^{i\theta};$$

$$g_1 = -\frac{3}{2} \operatorname{Im} \left[\frac{z(1-z^4)}{z^6 + \sqrt{5}z^3 - 1} \right]; \quad g_2 = -\frac{3}{2} \operatorname{Re} \left[\frac{z(1+z^4)}{z^6 + \sqrt{5}z^3 - 1} \right]; \quad g_3 = \operatorname{Im} \left[\frac{1+z^6}{z^6 + \sqrt{5}z^3 - 1} \right] - \frac{1}{2};$$

```

Manipulate[ParametricPlot3D[ $\frac{\{g_1, g_2, g_3\}}{g_1^2 + g_2^2 + g_3^2}$ ,
  {r, 0, 1}, {θ, 0, 2π},
  PlotPoints → 50, Mesh → False,
  Boxed → False, Axes → False, PlotStyle → {Opacity[0.75]},
  PlotRange → {All, All, {-2, t}}, ViewPoint → {1.57603, -2.20037, 2.03088},
  ViewVertical → {0.0428432, 0.0431793, 1.35113}
], {{t, 0}, -1.75, 0.5}]

```



```

ParametricPlot3D[ $\frac{\{g_1, g_2, g_3\}}{g_1^2 + g_2^2 + g_3^2}$ ,
  {r, 0, 1}, {θ, 0, 2π},
  PlotPoints → 50, Mesh → False, Boxed → False, Axes → False,
  PlotRange → {All, All, {-0.8, -0.4}}, ViewPoint → {1.57603, -2.20037, 2.03088},
  ViewVertical → {0.0428432, 0.0431793, 1.35113}
]

```

```

Table[
  ParametricPlot3D[ $\frac{\{g_1, g_2, g_3\}}{g_1^2 + g_2^2 + g_3^2}$ ,
    {r, 0, 1}, {θ, 0, 2π},
    PlotPoints → 50, Mesh → False, Boxed → False, Axes → False,
    PlotRange → {All, All, {t, t + 0.1}}, ViewPoint → {1.57603, -2.20037, 2.03088},
    ViewVertical → {0.0428432, 0.0431793, 1.35113}
  ],
  {t, -1.8, 0.5, 0.1}
]

```

$z = r e^{i\theta}$;

$$g_1 = -\frac{3}{2} \operatorname{Im}\left[\frac{z(1-z^4)}{z^6 + \sqrt{5}z^3 - 1}\right]; \quad g_2 = -\frac{3}{2} \operatorname{Re}\left[\frac{z(1+z^4)}{z^6 + \sqrt{5}z^3 - 1}\right]; \quad g_3 = \operatorname{Im}\left[\frac{1+z^6}{z^6 + \sqrt{5}z^3 - 1}\right] - \frac{1}{2};$$

```

Manipulate[ParametricPlot3D[ $\frac{\{g_1, g_2, g_3\}}{g_1^2 + g_2^2 + g_3^2}$ ,
  {r, 0, t}, {θ, 0, 2π},
  PlotPoints → 50, Mesh → False,
  Boxed → False, Axes → False, PlotStyle → {Opacity[0.75]}
], {{t, 0.5}, 0.1, 1}]

```



```

z = r eiθ;
g1 = - $\frac{3}{2}$  Im $\left[\frac{z(1-z^4)}{z^6 + \sqrt{5}z^3 - 1}\right]$ ; g2 = - $\frac{3}{2}$  Re $\left[\frac{z(1+z^4)}{z^6 + \sqrt{5}z^3 - 1}\right]$ ; g3 = Im $\left[\frac{1+z^6}{z^6 + \sqrt{5}z^3 - 1}\right] - \frac{1}{2}$ ;

frames = Table[ParametricPlot3D $\left[\frac{\{g_1, g_2, g_3\}}{g_1^2 + g_2^2 + g_3^2}$ ,
  {r, 0, 1}, {θ, 0, 2π},
  PlotPoints → 50, Mesh → False,
  Boxed → False, Axes → False, PlotStyle → {Opacity[0.75]},
  PlotRange → {All, All, {-2, t}}
],
{t, Union[
  Table[t, {t, -1.4, 0.5, 0.02}],
  Table[t, {t, -0.9, -0.5, 0.005}]
]}
];

SetDirectory["C:\\drorbn\\AcademicPensieve\\2013-04"];
Export["Boy.gif", frames]

Boy.gif

```