

Pensieve header: Flying Pogs ... continued pensieve://2015-11/xtx/.

```
<< KnotTheory`
```

```
Loading KnotTheory` version of September 6, 2014, 13:37:37.2841.
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Read more at http://katlas.org/wiki/KnotTheory.
```

```
Pog::usage =
```

```
"Pog[R,r,h,v,m] represents a standard + crossing pog of radius R, height 2h, translation v, rotation matrix m, and tube radius r."
```

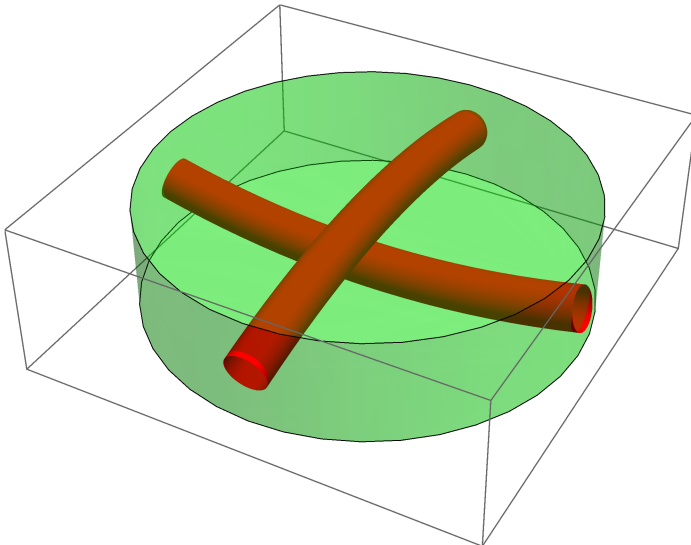
```
Pog[R_, r_, h_, v_, m_] := GeometricTransformation[
  {
    Green, Opacity[0.3], Cylinder[{{0, 0, -h}, {0, 0, h}}, R],
    Red, Opacity[1], CapForm[None], {
      Tube[BSplineCurve[{{1, 0, 0}, {0, 0, -h}, {-1, 0, 0}}], r],
      Tube[BSplineCurve[{{0, 1, 0}, {0, 0, h}, {0, -1, 0}}], r]
    }
  },
  AffineTransform@{v, m}
]
```

```
? Pog
```

---

Pog[R,r,h,v,m] represents a standard + crossing pog of radius R, height 2h, translation v, rotation matrix m, and tube radius r.

```
Pog[1, 0.1, 0.25, IdentityMatrix@3, {0, 0, 0}] // Graphics3D
```

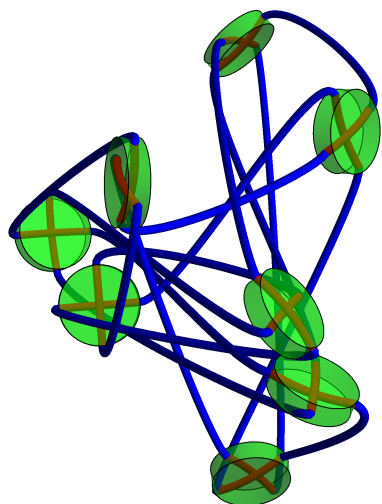


```

PogForm /: PogForm[RR_, R_, r_, h_] [pd_PD] :=
Module[{n, vs, ms, es, i1, d1, i2, d2, tvs, dvs},
  tvs = {{R, 0, 0}, {0, R, 0}, {-R, 0, 0}, {0, -R, 0}};
  dvs = {{R, 0, -h}, {0, R, h}, {-R, 0, -h}, {0, -R, h}};
  n = Length[pd];
  es = List@@Union@@pd;
  vs = RandomReal[{-RR + R, RR - R}, {n, 3}];
  ms = Table[Orthogonalize[RandomReal[{-1, 1}, {3, 3}]], {n}];
  Graphics3D[{
    Table[Pog[R, r, h, ms[[i]], vs[[i]], {i, n}],
    Blue, Opacity[1], CapForm[None],
    Table[
      {{i1, d1}, {i2, d2}} = Position[pd, e];
      Tube[BSplineCurve[{
        vs[[i1]] + ms[[i1]].tvs[[d1]], vs[[i1]] + ms[[i1]].(tvs[[d1]] + dvs[[d1]]),
        vs[[i2]] + ms[[i2]].(tvs[[d2]] + dvs[[d2]]), vs[[i2]] + ms[[i2]].tvs[[d2]]
      }], r],
      {e, es}
    ]
  }, Boxed -> False]
]

```

```
Knot[8, 17] // PD // PogForm[6, 1, 0.1, 0.25]
```



```
PD[X[1, 4, 2, 3], X[4, 3, 1, 2]] // PogForm[4, 1, 0.1, 0.25]
```

