In[2]:=
```
Import["https://github.com/JonathanGorard/Gravitas/raw/main/MetricTensor.wl"]
Import["https://github.com/JonathanGorard/Gravitas/raw/main/ExtrinsicCurvatureTensor.wl"]
Import["https://github.com/JonathanGorard/Gravitas/raw/main/ADMDecomposition.wl"]
Import[
 "https://github.com/JonathanGorard/Gravitas/raw/main/DiscreteHypersurfaceDecomposition.
   wl"]

extrinsic = ExtrinsicCurvatureTensor[ADMDecomposition["Schwarzschild"]]
```

Out[6]=
ExtrinsicCurvatureTensor[ Type: Covariant Symbol: $K_{\mu\nu}$
Dimensions: 3 Signature: Indeterminate]

In[7]:=
```
extrinsic["ReducedMatrixRepresentation"]
```

Out[7]=
$$\left\{\left\{\frac{-M\,\beta^1[t,r,\theta,\phi]+r\,(r-2M)\,(\beta^1)^{(0,1,0,0)}[t,r,\theta,\phi]}{(r-2M)^2\,\alpha[t,r,\theta,\phi]},\ \frac{r\left(\frac{(\beta^1)^{(0,0,1,0)}[t,r,\theta,\phi]}{r-2M}+r\,(\beta^2)^{(0,1,0,0)}[t,r,\theta,\phi]\right)}{2\,\alpha[t,r,\theta,\phi]},\right.\right.$$
$$\left.\frac{r\left(\frac{(\beta^1)^{(0,0,0,1)}[t,r,\theta,\phi]}{r-2M}+r\,\text{Sin}[\theta]^2\,(\beta^3)^{(0,1,0,0)}[t,r,\theta,\phi]\right)}{2\,\alpha[t,r,\theta,\phi]}\right\},$$
$$\left\{\frac{r\left(\frac{(\beta^1)^{(0,0,1,0)}[t,r,\theta,\phi]}{r-2M}+r\,(\beta^2)^{(0,1,0,0)}[t,r,\theta,\phi]\right)}{2\,\alpha[t,r,\theta,\phi]},\ \frac{r\,(\beta^1[t,r,\theta,\phi]+r\,(\beta^2)^{(0,0,1,0)}[t,r,\theta,\phi])}{\alpha[t,r,\theta,\phi]},\right.$$
$$\left.\frac{r^2\,((\beta^2)^{(0,0,0,1)}[t,r,\theta,\phi]+\text{Sin}[\theta]^2\,(\beta^3)^{(0,0,1,0)}[t,r,\theta,\phi])}{2\,\alpha[t,r,\theta,\phi]}\right\},$$
$$\left\{\frac{r\left(\frac{(\beta^1)^{(0,0,0,1)}[t,r,\theta,\phi]}{r-2M}+r\,\text{Sin}[\theta]^2\,(\beta^3)^{(0,1,0,0)}[t,r,\theta,\phi]\right)}{2\,\alpha[t,r,\theta,\phi]},\right.$$
$$\frac{r^2\,((\beta^2)^{(0,0,0,1)}[t,r,\theta,\phi]+\text{Sin}[\theta]^2\,(\beta^3)^{(0,0,1,0)}[t,r,\theta,\phi])}{2\,\alpha[t,r,\theta,\phi]},$$
$$\left.\left.\frac{r\,\text{Sin}[\theta]^2\,(\beta^1[t,r,\theta,\phi]+r\,(\text{Cot}[\theta]\,\beta^2[t,r,\theta,\phi]+(\beta^3)^{(0,0,0,1)}[t,r,\theta,\phi]))}{\alpha[t,r,\theta,\phi]}\right\}\right\}$$

In[8]:=
```
decomposition = DiscreteHypersurfaceDecomposition[
  MetricTensor[{"Schwarzschild", 1}, {t, r, θ, ϕ}], {t, 0, 1}, {r, 0, 4}, {θ, -Pi, Pi}, 400, 1.2]
```

Out[8]=
DiscreteHypersurfaceDecomposition[ Time Coordinate: t Time Interval: {0, 1}
Vertices: 400 Discretization Scale: 1.2]

In[9]:= `image = Graph[decomposition["CoordinatizedPolarGraphColored"], ImageSize → Large]`

Out[9]=