In[202]:=
```
ClearAll["Global`*"]
```

Energy function for 1-axis quantization

Path function for export

In[203]:=
```
mypath[imageName_] :=
  StringTemplate["````.pdf"][NotebookDirectory[], imageName];
```

Function for setting up the ticks length
Source: https://mathematica.stackexchange.com/questions/206173/increasing-the-length-of-frame-ticks

In[204]:=
```
(*Needs["GeneralUtilities`"];
PrintDefinitions[Charting`ScaledTicks];
tickFunc=
 Charting`ScaledTicks[{Identity,Identity},TicksLength→{.05,.02}][##]&;*)
```

Spin components 1-axis

In[205]:=
```
jvalue = 13 / 2; (* --→ j [ħ] <--- *)
SpinValue = 35 / 2; (* --→ I [ħ] <--- *)
j11 = jvalue * Cos[Pi / 4];
j21 = jvalue * Sin[Pi / 4] Cos[Pi / 4];
j31 = jvalue * Sin[Pi / 4] Sin[Pi / 4];
Print["j₁=", N[j11], "\n", "j₂=",
 N[j21], "\n", "j₃=", N[j31], "\n", "I=", SpinValue]
```

```
j₁=4.59619
j₂=3.25
j₃=3.25
I=35/2
```

Spin components 2-axis

In[210]:=
```
jvalue = 13 / 2; (* ---> j [ħ] <--- *)
SpinValue = 35 / 2; (* ---> I [ħ] <--- *)
j12 = jvalue * Sin[Pi / 4] Sin[Pi / 4];
j22 = jvalue * Cos[Pi / 4];
j32 = jvalue * Sin[Pi / 4] Cos[Pi / 4];
Print["j₁=", N[j12], "\n", "j₂=",
 N[j22], "\n", "j₃=", N[j32], "\n", "I=", SpinValue]
```

```
j₁=3.25
j₂=4.59619
j₃=3.25
I=35/2
```

Energy function for 1-axis and 2-axis quantization

One energy formula for each quantization axis

In[215]:=
```
Energy1Axis[th_, phi_] :=
  1/120 (SpinValue * Cos[th] - j11)^2 + 1/40 (SpinValue * Sin[th] Cos[phi] - j21)^2 +
   1/60 (SpinValue * Sin[th] Sin[phi] - j31)^2;
Energy2Axis[th_, phi_] := 1/120 (SpinValue * Sin[th] Sin[phi] - j12)^2 +
   1/40 (SpinValue * Cos[th] - j22)^2 + 1/60 (SpinValue * Sin[th] Cos[phi] - j32)^2;
```

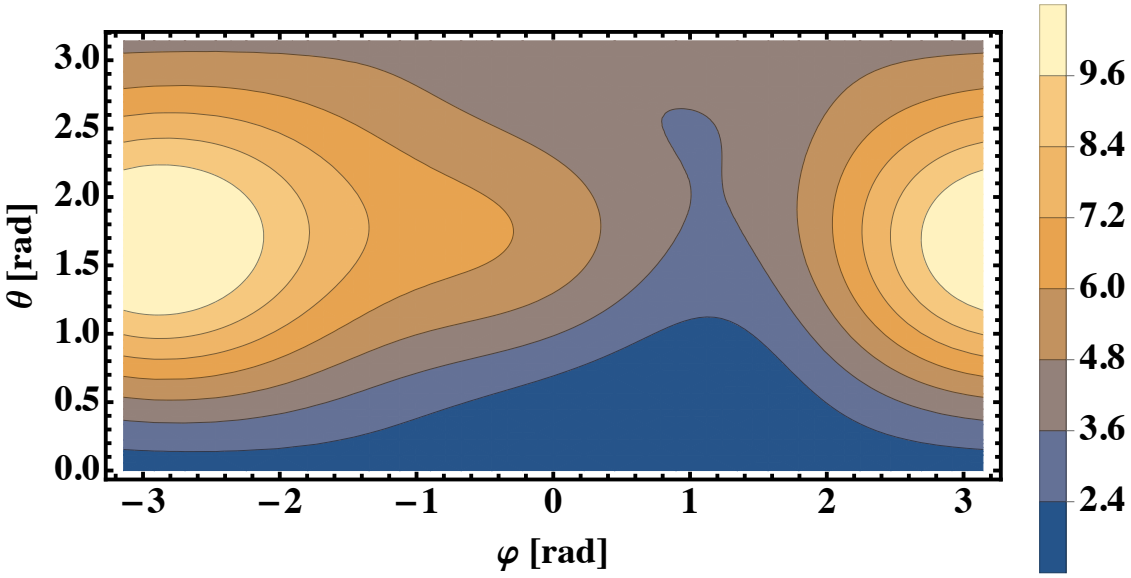
Contour-Plots 1-axis

```
contourSet1Axis = ContourPlot[Energy1Axis[th, phi], {phi, -Pi, Pi},
    {th, 0, Pi}, AspectRatio → Automatic, ImageSize → {520, 320}, Frame → True,
    (*FrameTicks→{{tickFunc,tickFunc},{tickFunc,tickFunc}},*)
    FrameStyle → Directive[Black, Thick], FrameLabel → {"φ [rad]", "θ [rad]"},
    PlotLegends → Automatic, LabelStyle → {19, Bold, Black, FontFamily → "Times"},
    Contours → 7(*PlotLabel→StringTemplate["I=``/2 [ħ]"][SpinValue*2]*)];
```

Export figures 1-axis

In[218]:=
```
Export[mypath["contourSet1Axis"], Show[contourSet1Axis]];
Show[contourSet1Axis]
```

Out[219]=



Contour-Plots 2-axis

```
contourSet2Axis = ContourPlot[Energy2Axis[th, phi], {phi, -Pi, Pi},
    {th, 0, Pi}, AspectRatio → Automatic, ImageSize → {520, 320}, Frame → True,
    (*FrameTicks→{{tickFunc,tickFunc},{tickFunc,tickFunc}},*)
    FrameStyle → Directive[Black, Thick], FrameLabel → {"φ [rad]", "θ [rad]"},
    PlotLegends → Automatic, LabelStyle → {19, Bold, Black, FontFamily → "Times"},
    Contours → 7(*PlotLabel→StringTemplate["I=``/2 [ℏ]"][SpinValue*2]*)];
```

Export figures 2-axis

In[221]:=
```
Export[mypath["contourSet2Axis"], Show[contourSet2Axis]];
Show[contourSet2Axis]
```

Out[222]=