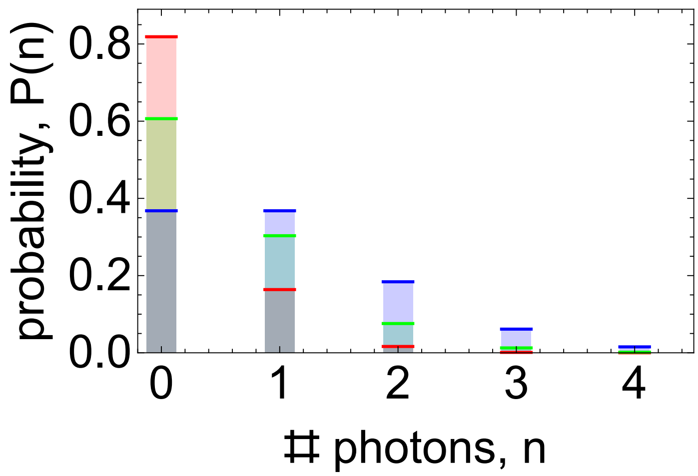
```
(*Probability that n photons are present
 (or more accurately: probability that the projection of
     a coherent state is a Fock state with photon number n)*)
p[n_, nm_] := nm^n/Factorial[n] e^-nm;
(*nm = <n>, i,e, the expectation value of the photon number. For
 example, <n>=1 when you have one photon every coherence time*)
Needs["PlotLegends`"];
p1 = DiscretePlot[{p[n, .2], p[n, .5], p[n, 1]},
  {n, 0, 4}, PlotStyle → {Red, Green, Blue}, ExtentSize → 0.25,
  PlotRange → {{-.2, 4.5}, {0, .89}}, Frame → True,
  FrameLabel → {"# photons, n", "probability, P(n)"},
  LabelStyle → Directive[Large], FrameStyle → Black]
```

Out[51]=



Calculate probability that there are >1 photons present at a time

or more accurately: probability that the projection of a coherent state is a Fock state with photon number n>1

$\langle n \rangle = 0.1$

In[45]:=
```
1 - (p[0, .1] + p[1, .1])
```

Out[45]= 0.00467884

⟨n⟩ = 0.2

In[46]:=
```
1 - (p[0, .2] + p[1, .2])
```
Out[46]=
```
0.0175231
```

⟨n⟩ = 0.5

In[47]:=
```
1 - (p[0, .5] + p[1, .5])
```
Out[47]=
```
0.090204
```

⟨n⟩ = 1

In[49]:=
```
1. - (p[0, 1] + p[1, 1])
```
Out[49]=
```
0.264241
```