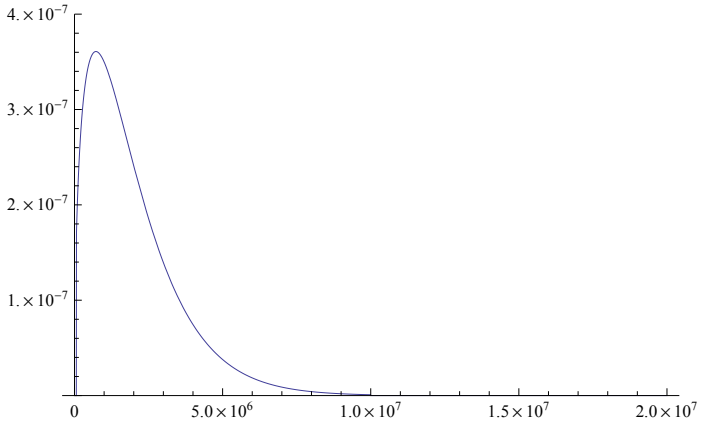
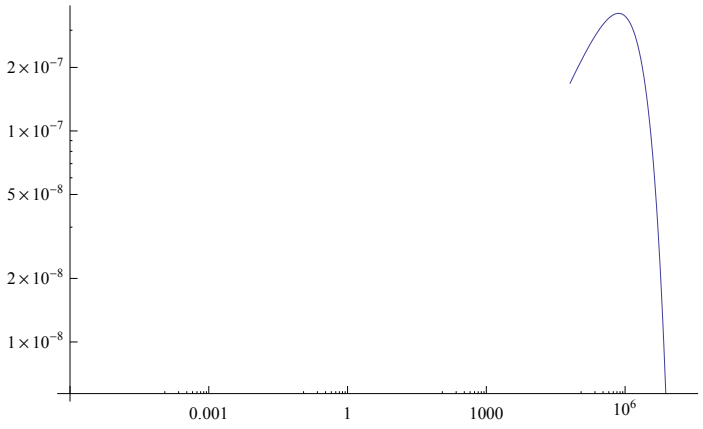
```
(* prompt U235 fission spectrum *)
Nrm = 986229 * 1.00666; (* normalized to 1 between 0.1 and 10 MeV *)
s235U[en_] := If[en > 64700 && en < 10 * 10^6,
    0.453 * Exp[-1.036 * en / 10^6] * Sinh[Sqrt[2.29 * en / 10^6]] / Nrm, 0];
Integrate[s235U[x], {x, 64700, 10 * 10^6}]
```

```
0.999995
```

```
Plot[s235U[x], {x, 0.000001, 2 * 10^7}, PlotRange → {0, 4 * 10^-7}]
```

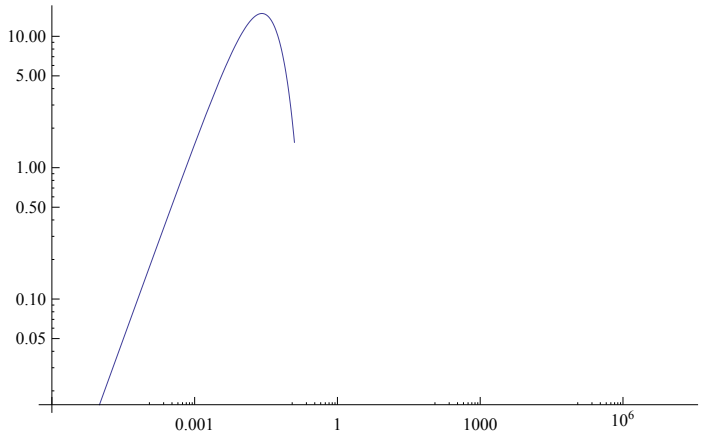



```
LogLogPlot[s235U[x], {x, 0.000001, 2 * 10^7}]
```



```
(* Maxwell Boltzmann Spectrum *)
Mrm = 84 481.8 / 0.674374; (* normalized to 1 between 0.00001 and 0.625 eV *)
k = 8.6173324 * 10^-5;
T = 300;
m = 939.565378 * 10^6;
MB[en_] := If[en > 0.00001 && en < 0.125,
    Mrm * 2 * Pi / ((Pi * k * T)^1.5) * Sqrt[(2 / m)] * en * Exp[-en / (k * T)], 0];
Integrate[MB[x], {x, 0.000001, 10}]
LogLogPlot[MB[x], {x, 0.000001, 2 * 10^7}]
```

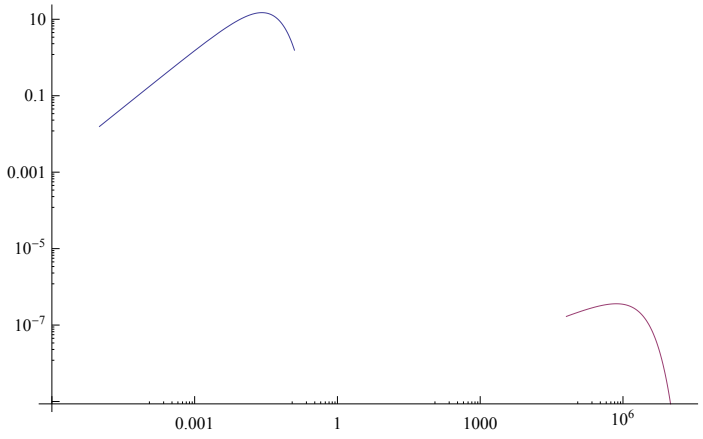
```
1.
```




```
FindMaximum[MB[x], {x, 0.000011}]
(*Maximum of reactor thermal power spectrum at 0.051 eV*)
```

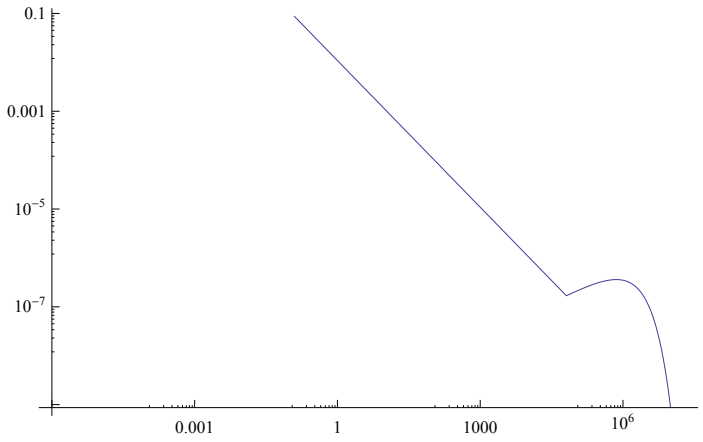
```
{14.922, {x → 0.025852}}
```

```
LogLogPlot[{MB[x], s235U[x]}, {x, 0.000001, 2 * 10^7}]
```

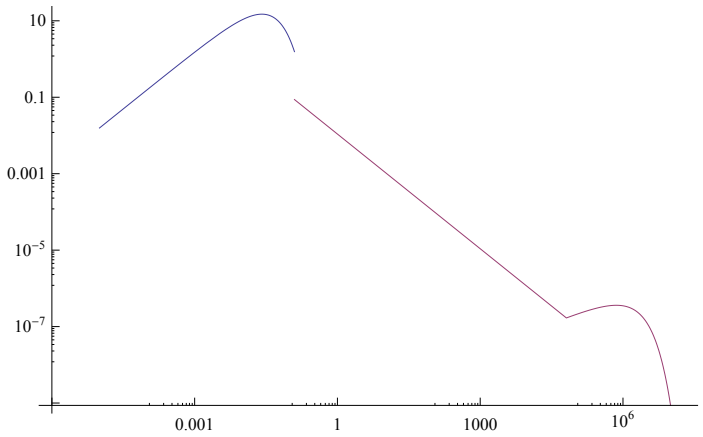


```
(* now comes the 1/E spectrum between the thermal and the fast group *)
ns1 = s235U[64 700.00001] * 64 700;
PhiFast[en_] :=
  If[en > 64 700 && en < 10 * 10^6, s235U[en], If[en < 64 700 && en > 0.125, ns1 / en, 0]];

LogLogPlot[PhiFast[x], {x, 0.000001, 2 * 10^7}]
```




```
LogLogPlot[{MB[x], PhiFast[x]}, {x, 0.000001, 2 * 10^7}]
```




```
SigmaFission = 0.185; SigmaTotal = 0.012;
(* normalize fission spectrum *)
NIntegrate[SigmaFission * PhiFast[x] / SigmaTotal, {x, 0.625, 10 * 10^6}]
```

```
17.3555
```

```
norm = 100;
LogLogPlot[{(MB[x] / 17.3) / norm, PhiFast[x] / norm},
 {x, 0.000001, 2 * 10^7}, PlotRange → {10^-12, 0.01}, AspectRatio → 1]
```