

**The last, at last!!**

**Due date:** Thursday, Dec. 6      **Deadline:** Tuesday, Dec. 11

1. (13) S 7.66 Bose condensation of  $^{87}\text{Rb}$  atoms.
2. (10) S 7.70 a,b Heat capacity of gas of bosons. We did part c in class. Compare your predicted value of  $C_V(T_c)$  with that in Fig. 7.37.
3. (12) S 7.75 a, b, c, d Leading corrections to classical results for boson gas at high temperature. For part b, show that the leading correction to  $\mu$  is about  $-k_B T (N/V) \Lambda_T^3 / \sqrt{8}$ .

In part d, start with

$$\ln \mathcal{Z} = (\pi/2) \int_0^\infty n^2 \ln \mathcal{Z}_n \, dn$$

use eqn. 7.24, assume the exponential term  $\ll 1$ , and expand  $\ln(1 + \delta) \approx \delta - \frac{1}{2} \delta^2$ .