

## AST 300B – Spring 2018

### In-class/take-home Problems Due: Friday April 20th

41. The ground state electronic configuration of Carbon is  $1s^2 2s^2 2p^2$ . You will want to make a table for this problem.

- What are the possible scalar values of  $L$  and  $S$ ?
- For each combination of  $L$  and  $S$ , what are the possible scalar values of  $J$ ?
- What are the terms that correspond to each  $L$ ,  $S$ , and  $J$  in your table? Hint: there are 10 terms in total.

In reality, not all these 10 terms exist because both valence electrons are in the *same orbital*, the possible combinations of  $L$ ,  $S$ , and  $J$  have to obey Pauli's Exclusion Principle. Next class, I will show you how to figure out which of the terms you derived satisfy Pauli.

