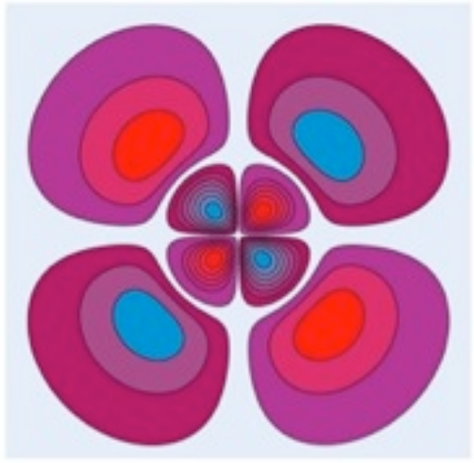


Wednesday, February 11

Last Time:

- New QM Vocabulary
- Eigenvalues and eigenfunctions
- Postulates of QM

Today:

- The hydrogen atom
  - Spherical coordinates
  - Separation of variables
  - Solving for each part

Readings:

- Levine 18.1–18.4

Handouts:

Homework #4

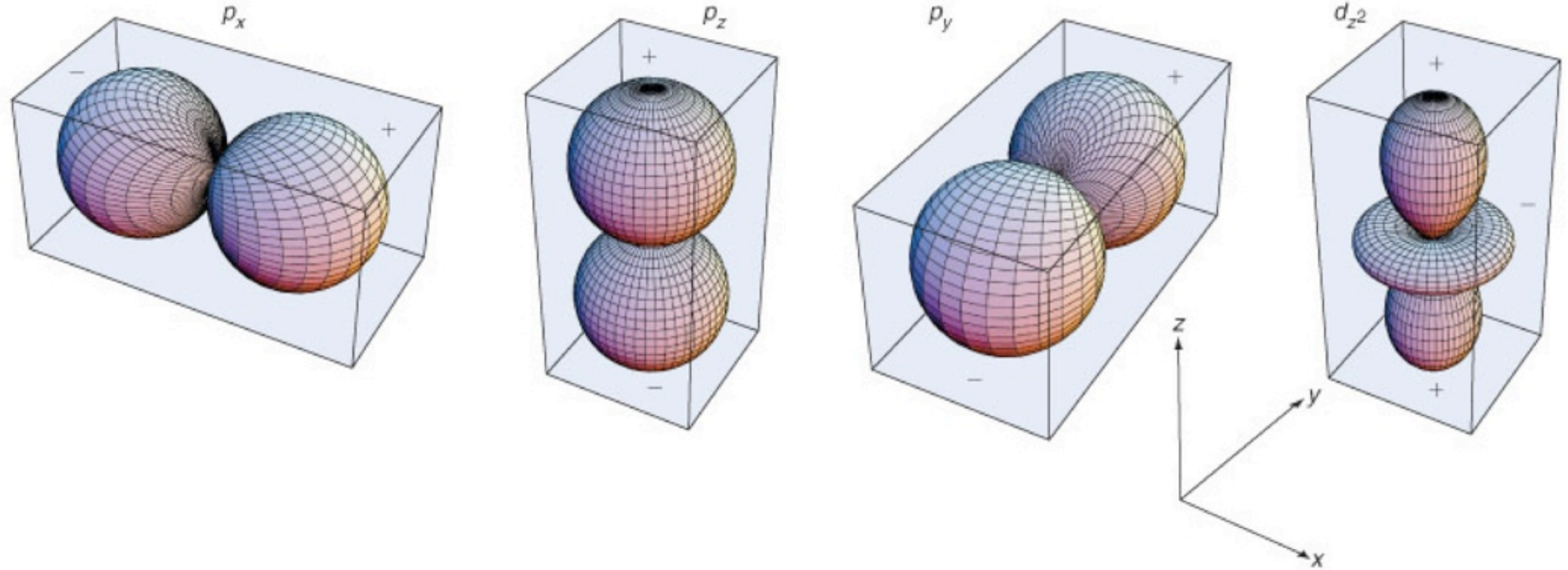
Hydrogen-atom reading

Reminders:

- Projects!

Angular part

l	m	$\Theta_{lm}(\theta)$	$\Phi_m(\phi)$	$\Theta\Phi$	"type"
0	0	1	1	1	s
1	0	$\cos\theta$	1	$\cos\theta$	p_z
1	1	$\sin\theta$	$e^{i\phi}$	$\sin\theta\cos\phi$	p_x
1	-1	$\sin\theta$	$e^{-i\phi}$	$\sin\theta\sin\phi$	p_y
2	0	$3\cos^2\theta - 1$	1	$3\cos^2\theta - 1$	d_{z^2}
2	1	$\sin\theta\cos\theta$	$e^{i\phi}$	$\sin 2\theta\cos\phi$	d_{xz}
2	-1	$\sin\theta\cos\theta$	$e^{-i\phi}$	$\sin 2\theta\sin\phi$	d_{yz}
2	2	$\sin^2\theta$	$e^{2i\phi}$	$\sin^2\theta\cos 2\phi$	$d_{x^2-y^2}$
2	-2	$\sin^2\theta$	$e^{-2i\phi}$	$\sin^2\theta\sin 2\phi$	d_{xy}


p_x
p_z
p_y
d_{z^2}
z
y
x
d_{xz}
$d_{x^2-y^2}$
d_{yz}
d_{xy}
z
y
x