Today (4)

Sections 1.11
An introduction to Molecular Orbital Theory

Next Class (5)

Sections 1.11
An introduction to Molecular Orbital Theory

Sections 1.5-1.10
Valence Bond Theory

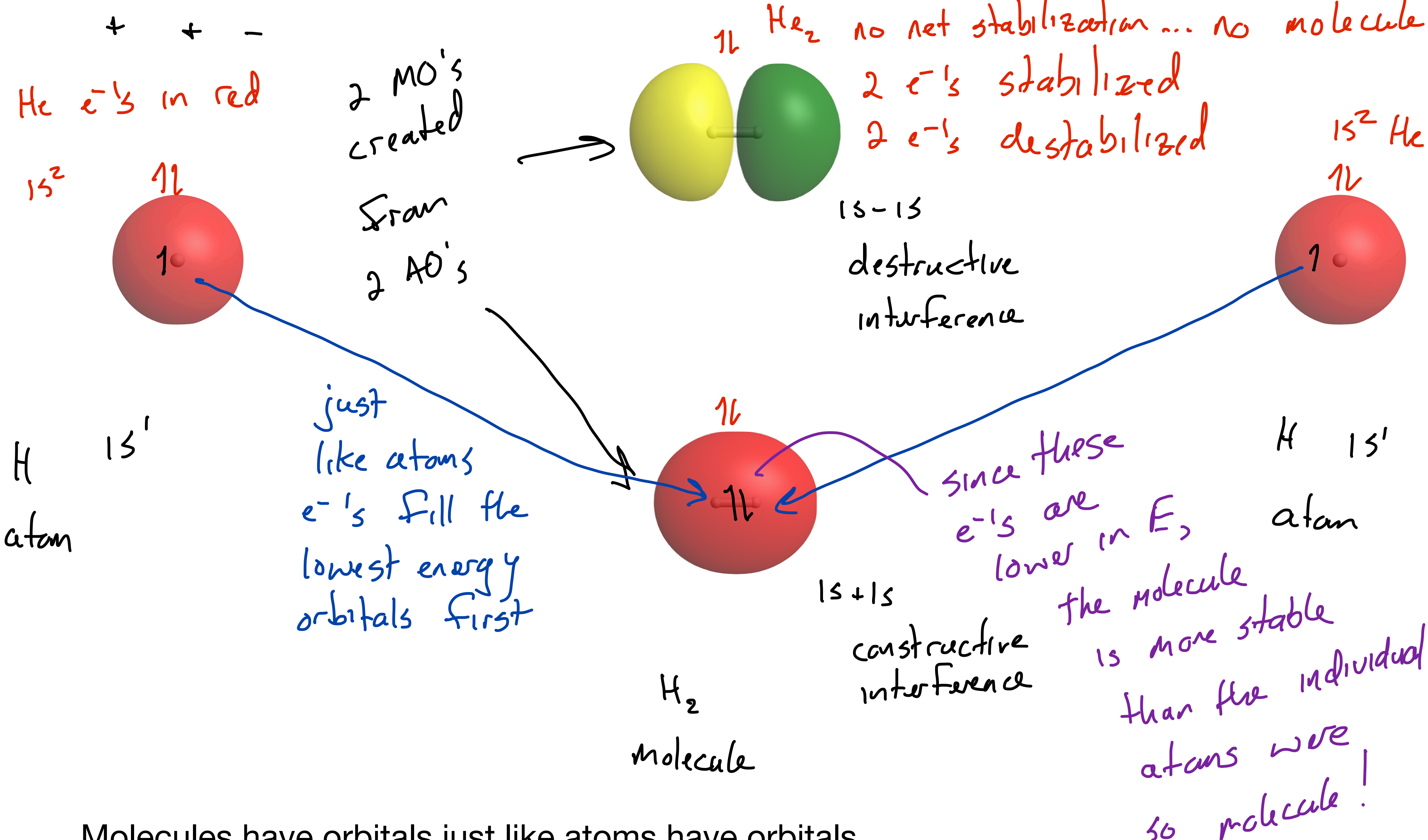
Second Class from Today (6)

Sections 1.5-1.10
Valence Bond Theory

Third Class from Today (7)

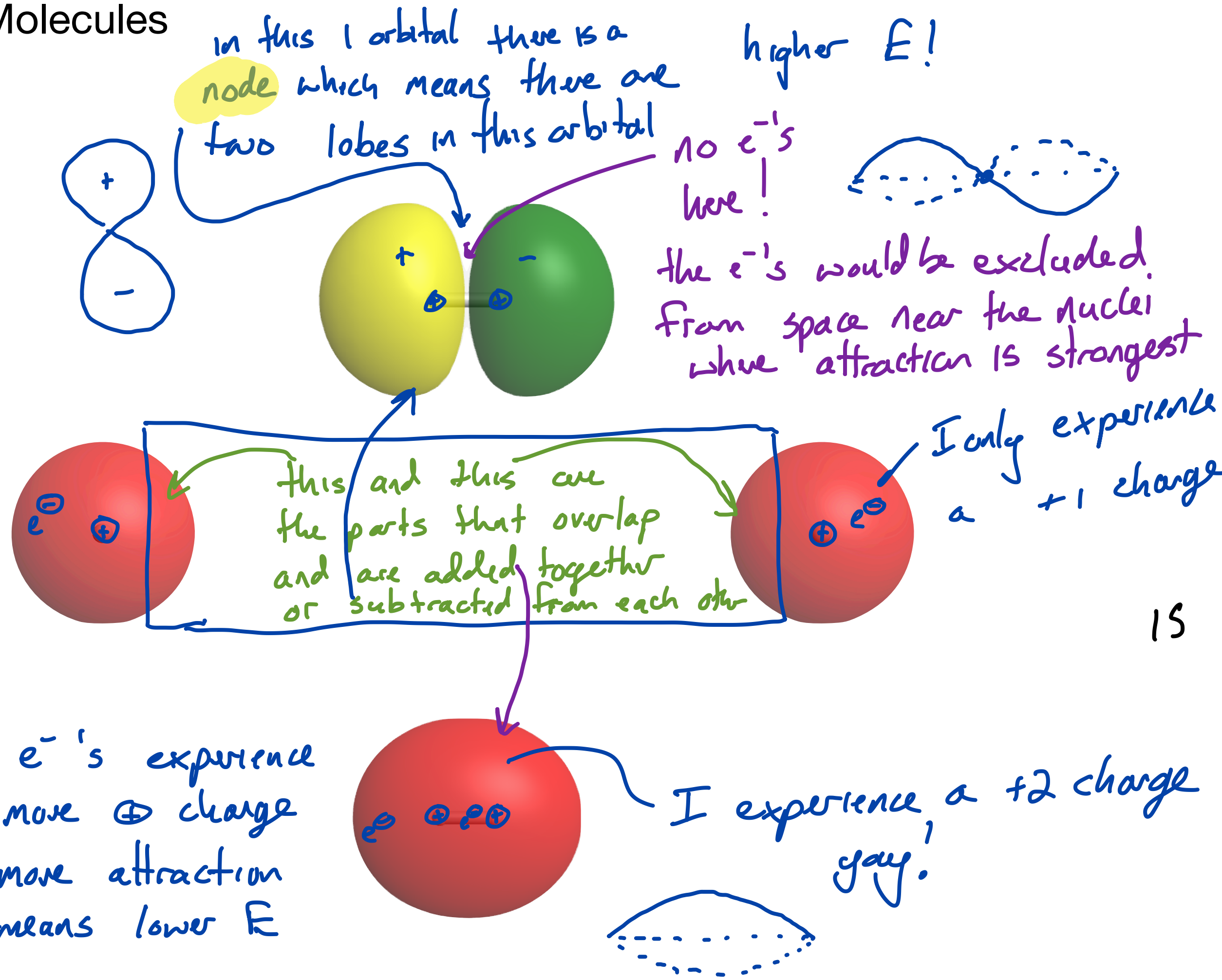
Sections 1.12
Drawing Chemical Structures

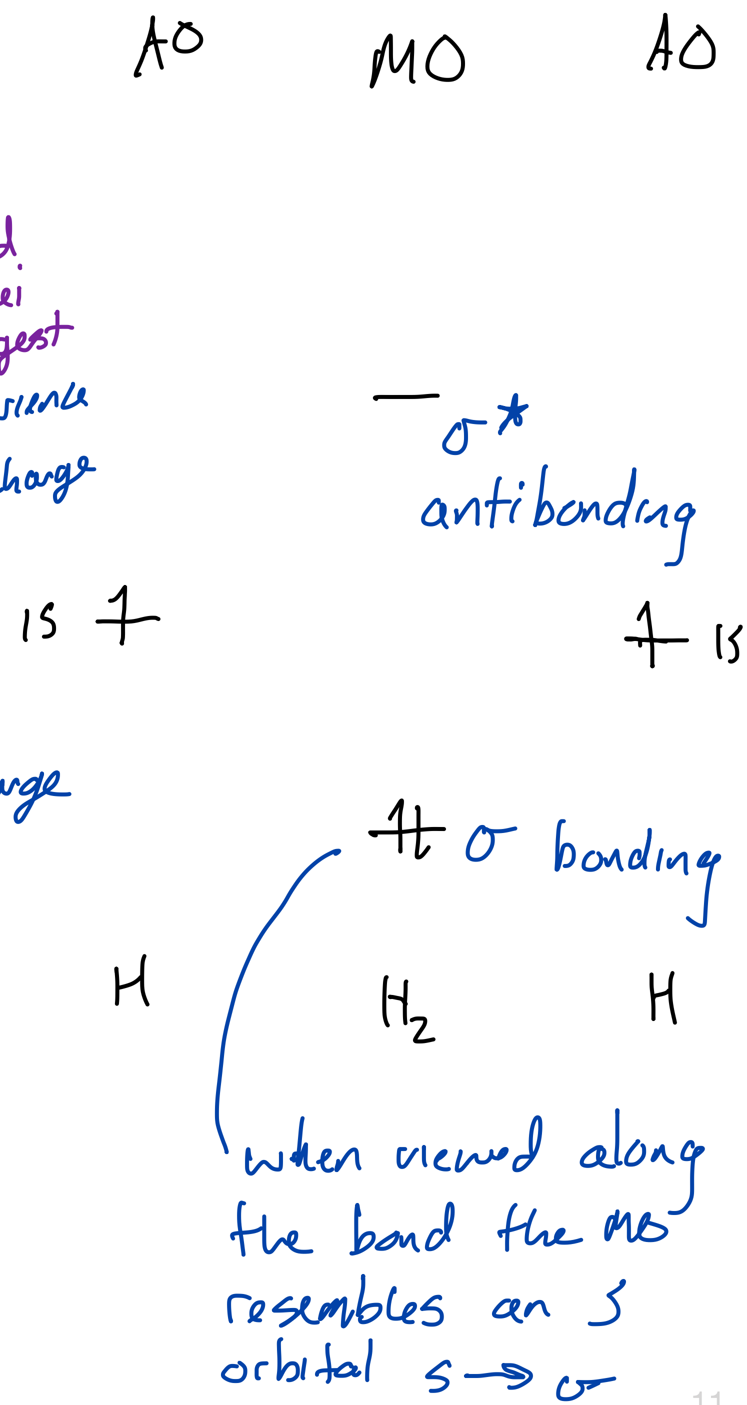
Linear Combinations of Atom Orbitals to approximate molecular orbitals



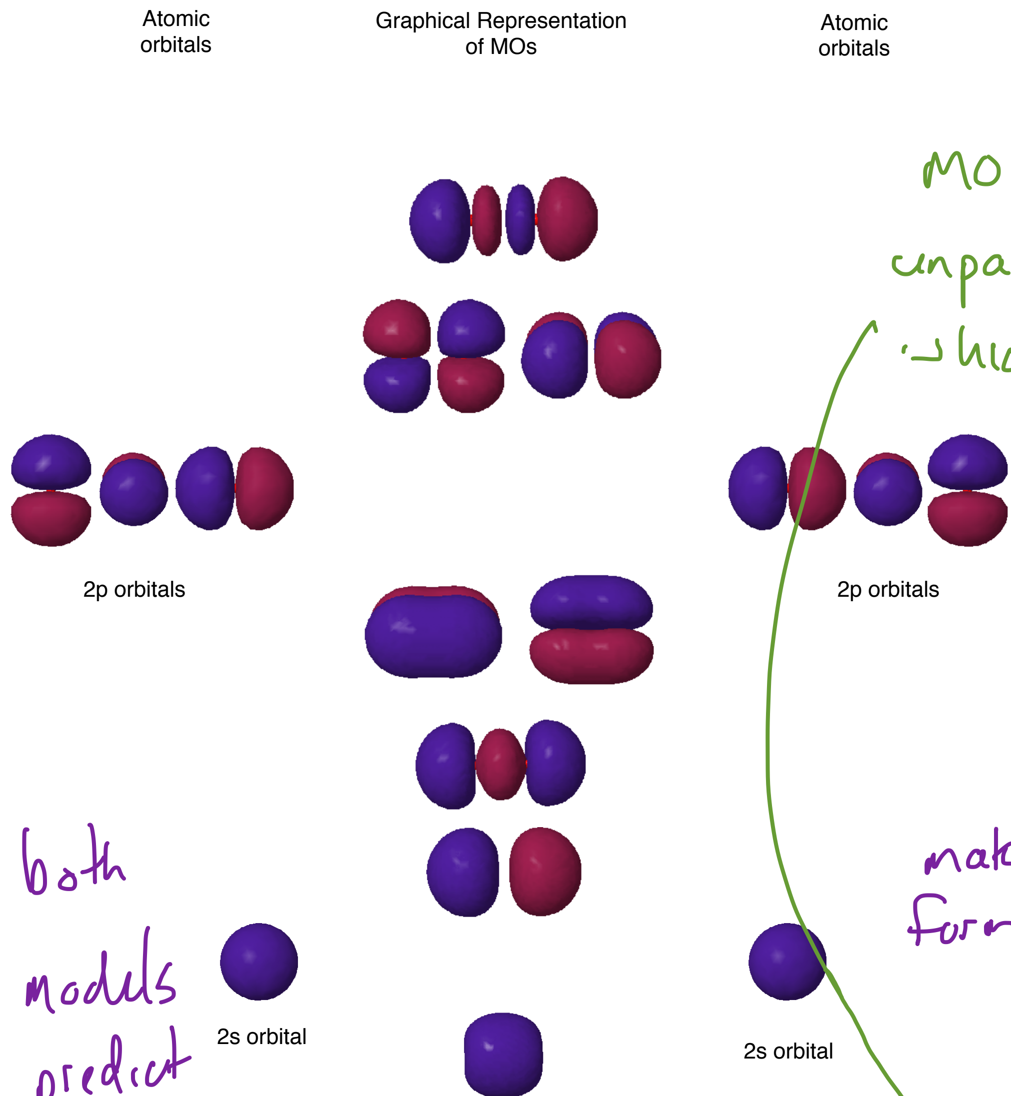
Molecules have orbitals just like atoms have orbitals

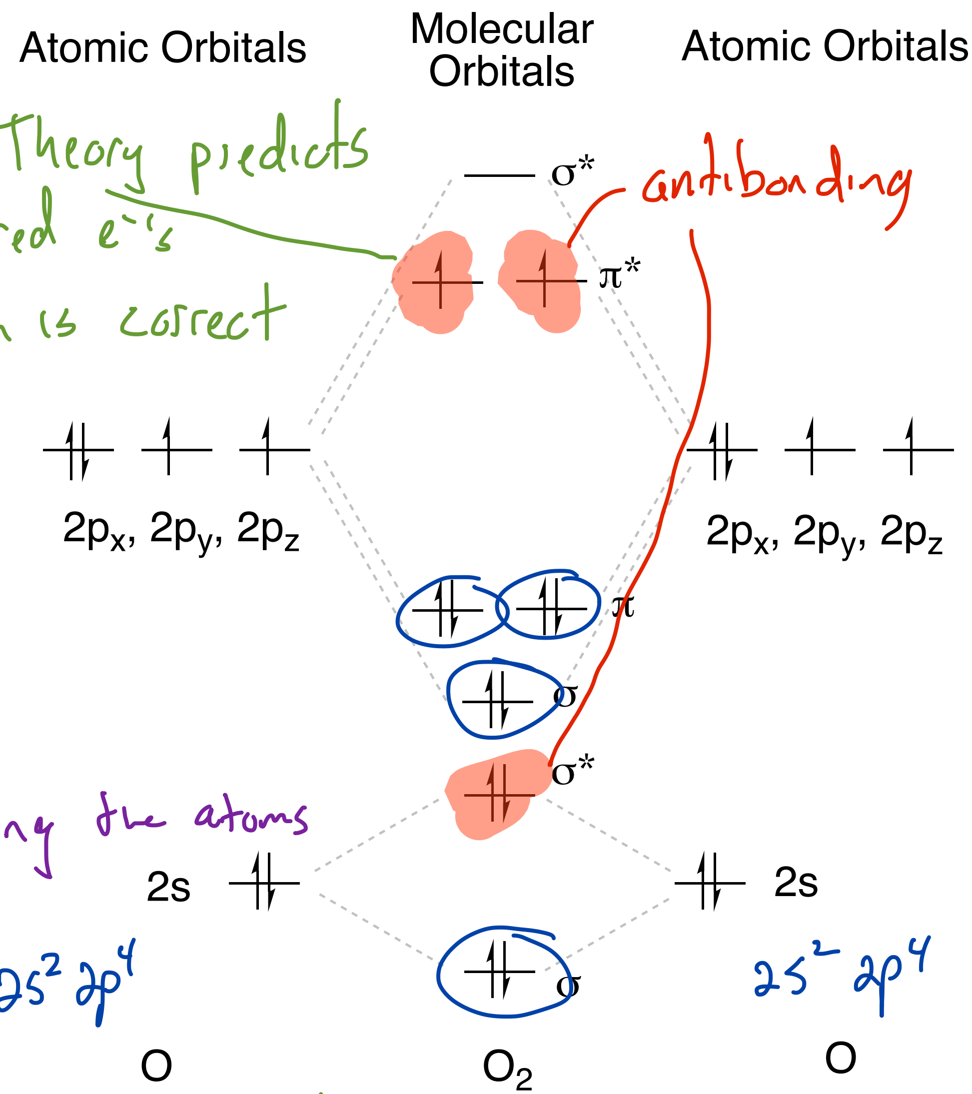
He_2 can be modeled using the same orbital





Molecules have orbitals just like atoms have orbitals





MO Theory predicts unpaired e^-'s which is correct

antibonding

making the atoms form

$2s^2 2p^4$ $2s^2 2p^4$

both models predict that 4 e^-'s are involved in making the atoms form a molecule

MO Theory net stabilization of 4 e's

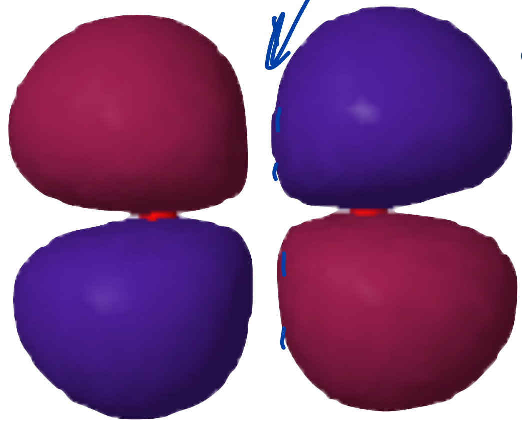
Lewis structure predicts paired e^-'s which is not correct

:Ö=Ö:

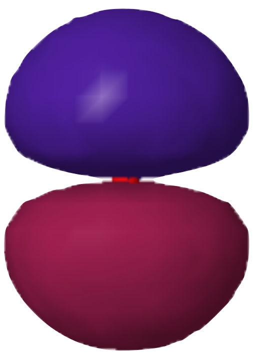
Lewis Theory 4 e^-'s shared in 2 bonds

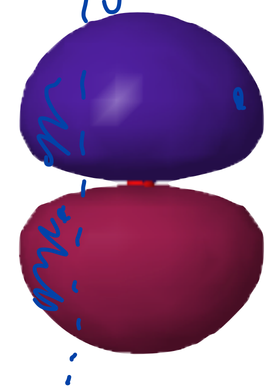
https://www.westfield.ma.edu/cmasi/organic/mo-plain/mo1.html

π* a.k.a.
π antibonding orbital

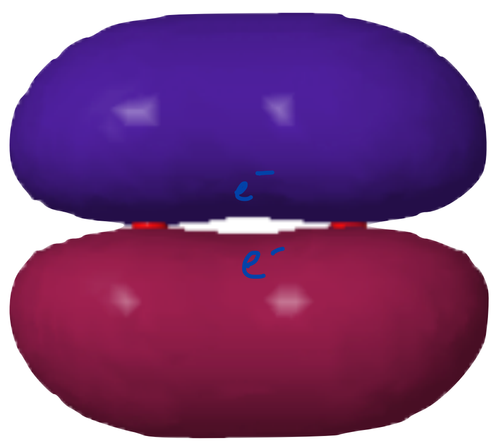


• more nodes
• prime real estate close to the ⊕ of the nucleus is lost
• e⁻'s in this orbital would be higher in E





π bonding orbital



no increase in the # of nodes
e⁻ can exist almost directly between nuclei . . .
lower in E

https://www.westfield.ma.edu/cmasi/organic/mo-plain/mo1.html