Orbital Overlap

Talk to a Teacher
http://spoken-tutorial.org
National Mission on Education through ICT
http://sakshat.ac.in

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Learning Objectives

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- **About different types of orbitals**

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- **Rotation and resize of orbitals**

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- **About different types of orbitals**
- **Rotation and resize of orbitals**
- **Types of orbital overlaps**

System Requirement

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- **Ubuntu Linux OS v 12.04**

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- **GChemPaint v 0.12.10**

Pre-requisites

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- **GChemPaint chemical structure editor**

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- **GChemPaint chemical structure editor**
- **If not, for relevant tutorials, please visit http://spoken-tutorial.org**

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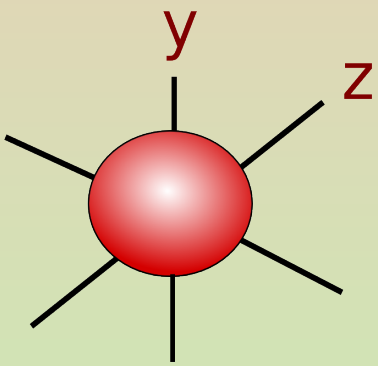
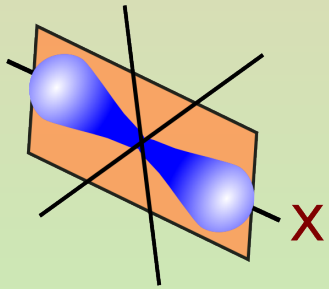
Atomic Orbital

- An atomic orbital is a mathematical function
- It describes the wave-like behavior of an electron in an atom
- An orbital is a region of space with maximum probability of finding an electron

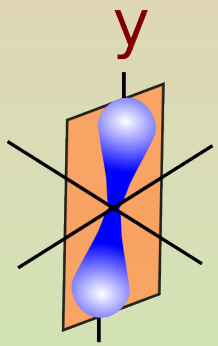
‘s’ and ‘p’ orbitals



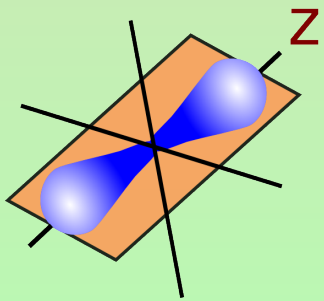
s Orbital



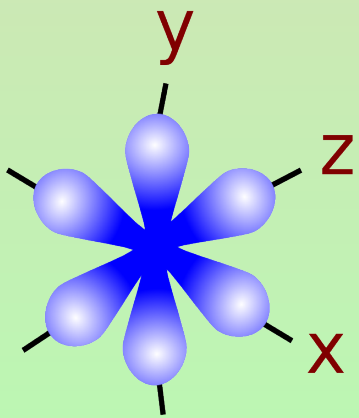
p_x Orbital



p_y Orbital

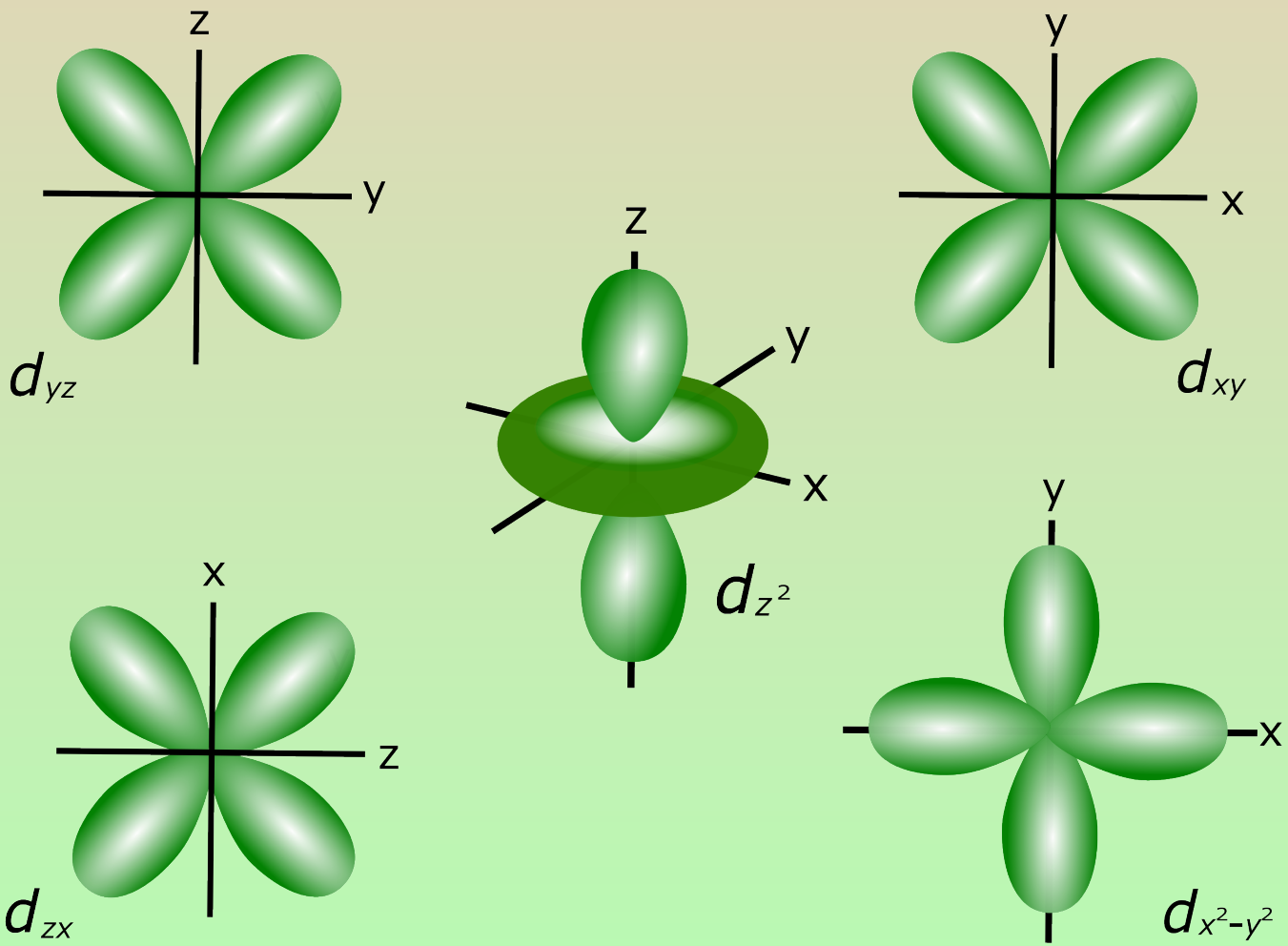


p_z Orbital

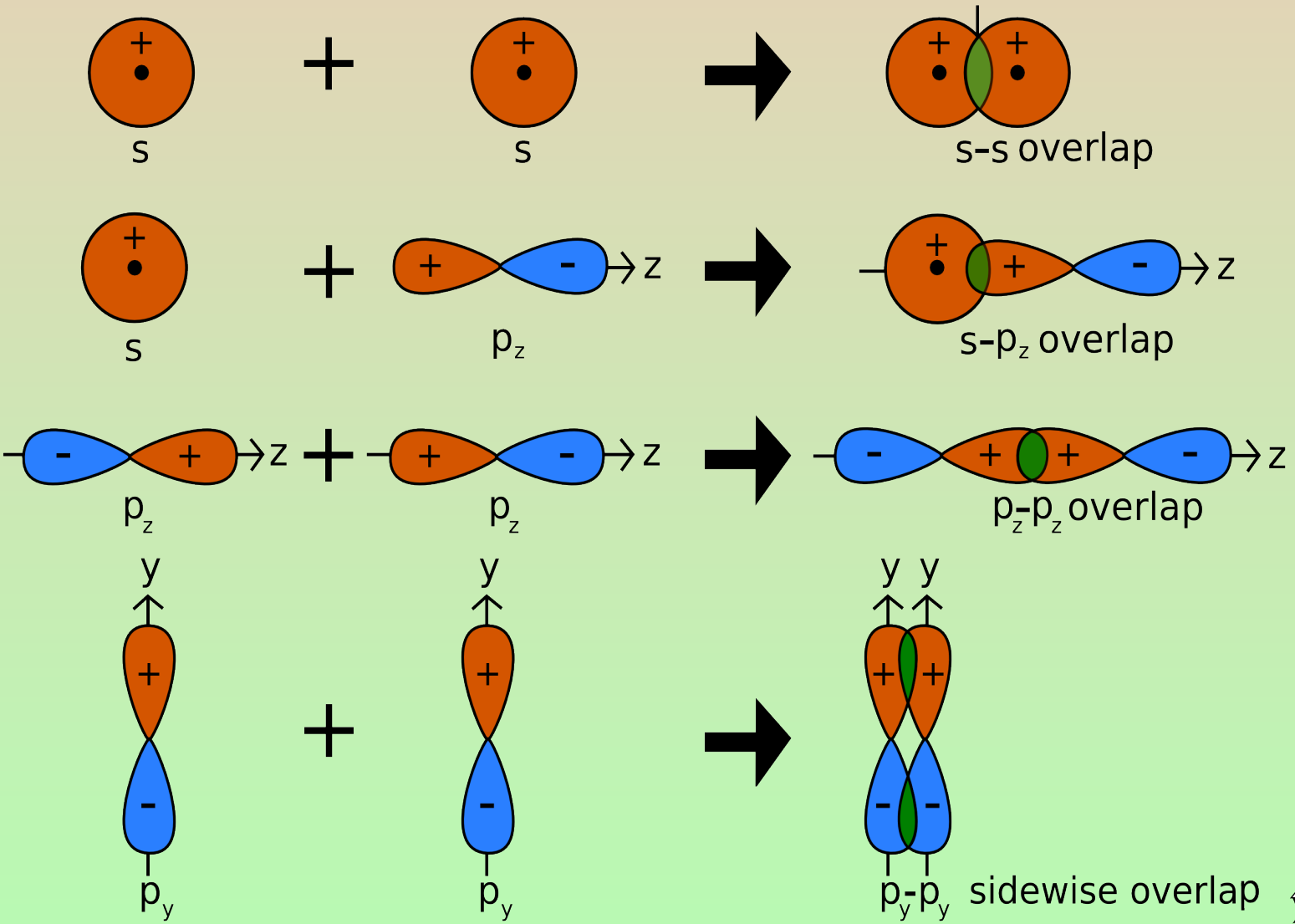


All p Orbital full

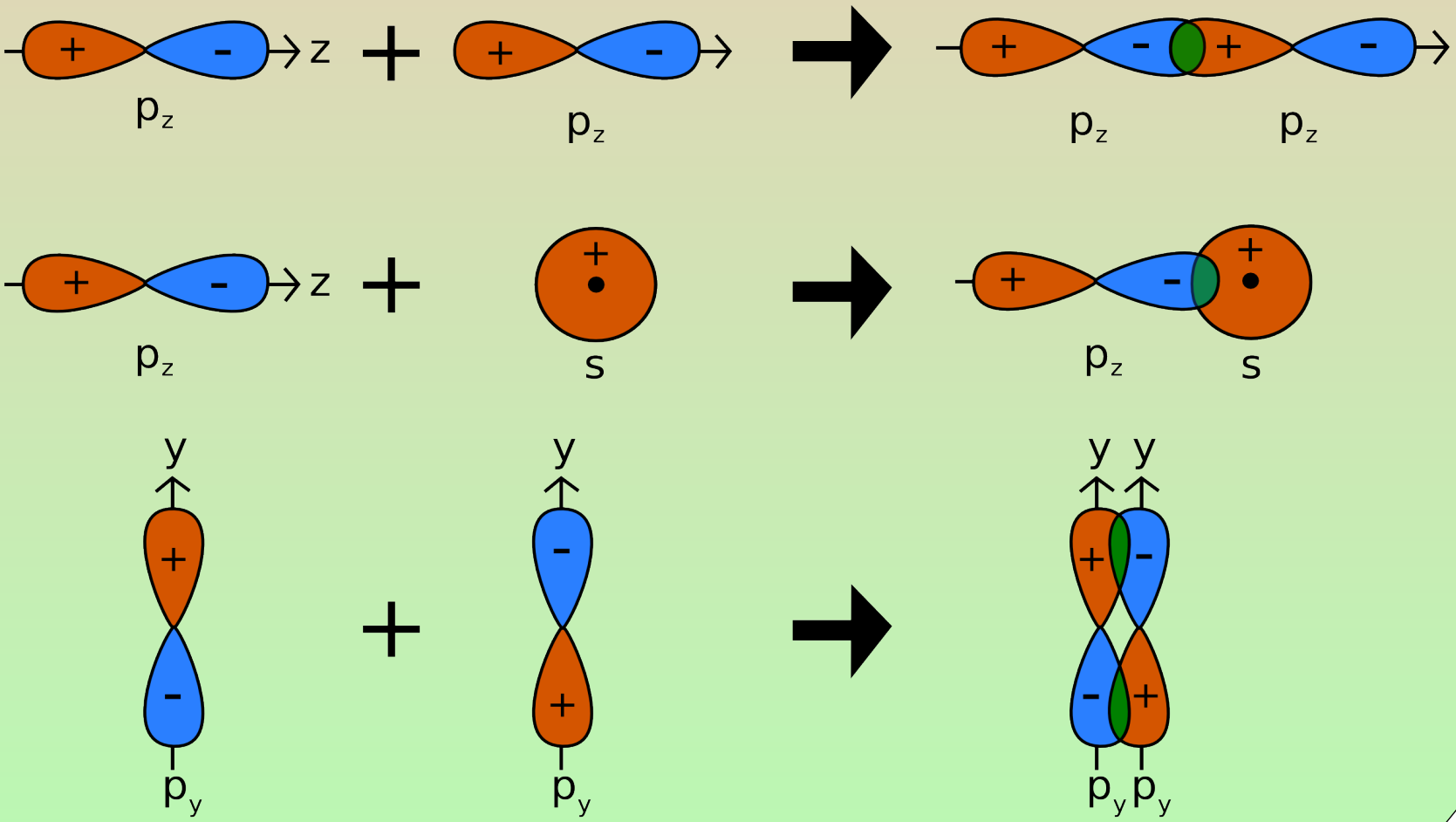
‘d’ orbitals



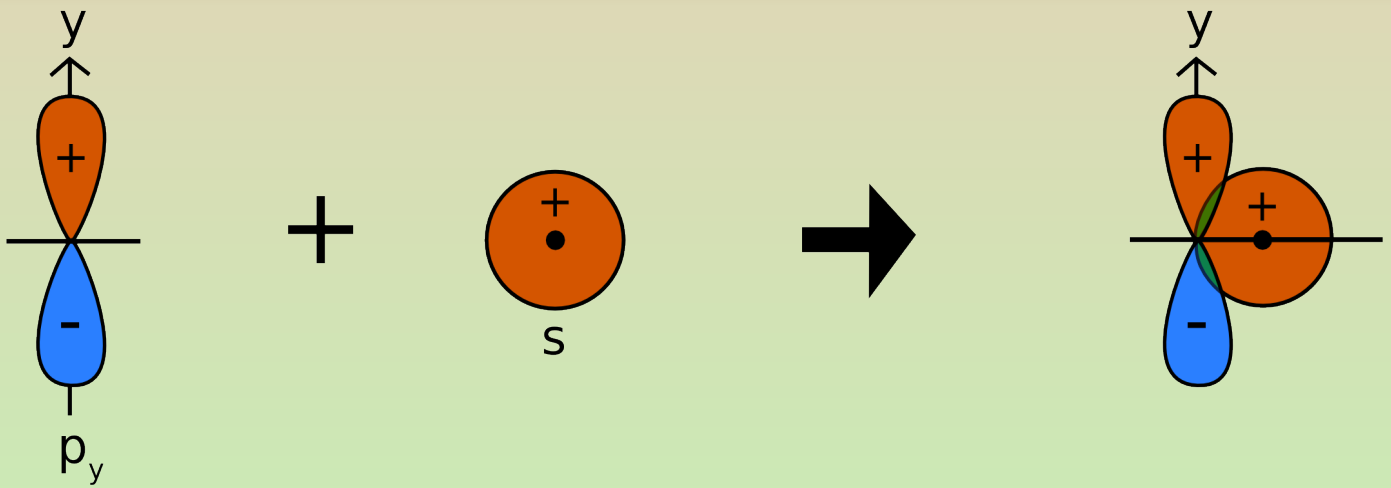
Positive overlaps - In phase overlap

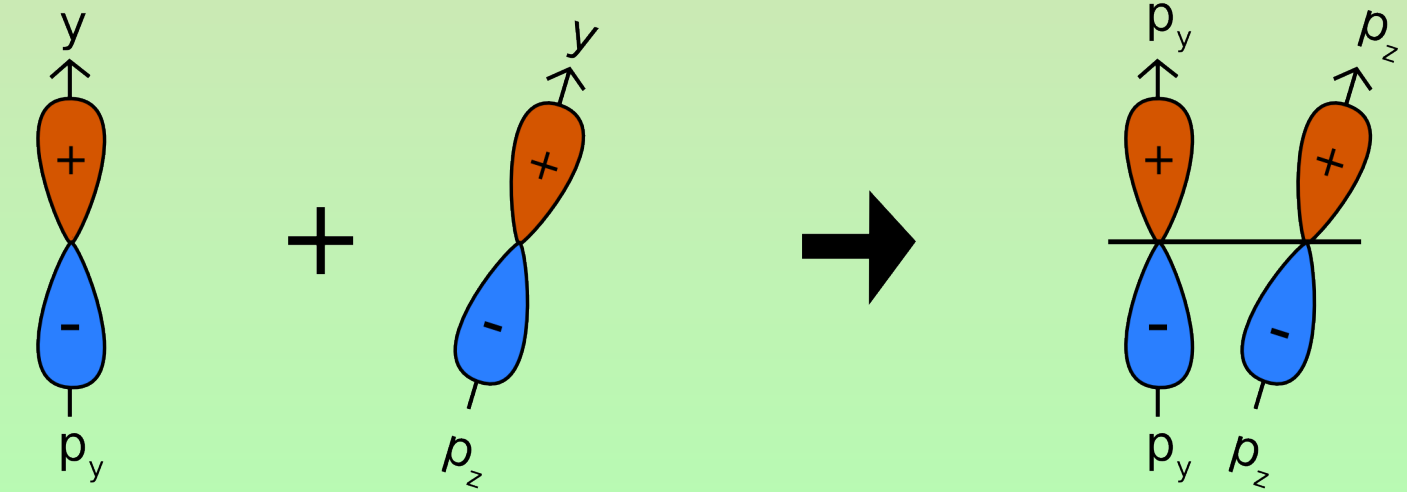


Negative overlaps - out of phase overlap



Zero overlap - out of phase due to different orientiation of approach





Summary

We have learnt,

- **About different types of orbitals**
- **End-on and side-wise overlaps**
- **Rotation and resize of orbitals**
- **Positive, negative and zero overlaps**

Assignment

1. Draw ‘s-p’ end-on overlap with Hydrogen chloride(H-Cl) molecule
2. Draw side-wise overlap of ‘dxy-dxy’ orbitals
3. Draw other negative and zero overlaps
4. Hint: Rotate and resize orbitals for proper overlap

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Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- **Conducts workshops using spoken tutorials**
- **Gives certificates to those who pass an online test**
- **For more details, please write to contact@spoken-tutorial.org**

Acknowledgements

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- More information on this Mission is available at http://spoken-tutorial.org/NMEICT-Intro