

# NONCOVALENT INTERACTIONS OF AROMATICS AND HETEROAROMATICS IN CHEMICAL AND BIOLOGICAL RECOGNITION

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This short course will survey noncovalent interactions of primarily heteroaromatics in the context of biological structure and molecular function. The *first part of the course* will review the general physical principles underlying the most common interactions involving heterocycles on the basis of recent theoretical, structural, and experimental findings. Included in the discussion will be aromatic-aromatic, edge-to-face and X-H... $\pi$ , ion- $\pi$  (including the recently popularized anion- $\pi$ ), heteroatom- $\pi$ , halogen and hydrogen bonding interactions. Recent synthetic but also biological examples will be used to illustrate key structural and energetic details.

The *second part of the course* will focus on the application of these noncovalent interactions in synthetic and biological recognition (e.g. involving peptides, carbohydrates, and nucleobases), sensor design (including a discussion of molecular switches and machines), reversible and nanoscale materials, and crystal engineering.

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