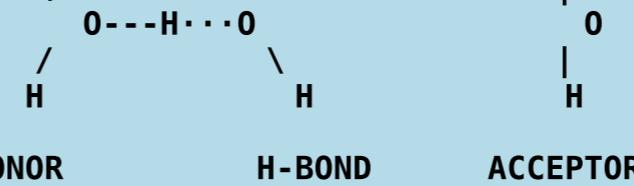


# Hydrogen Bond Dynamics: Water Dimer Categorical Observation with Zero Backaction

WATER-DIMER HYDROGEN BONDING

## (A) Water Dimer Hydrogen Bonding

### Categorical Dynamics Framework



#### Hydrogen Bond Properties:

- O-H···O interaction
- Distance: ~1.8-2.0 Å
- Energy: ~5 kcal/mol (~21 kJ/mol)
  - Angle: ~180° (linear)
  - Dynamics: ps-ns timescale

#### Categorical Observation:

- ✓ Zero backaction measurement
- ✓ Femtosecond time resolution
- ✓ Complete trajectory capture

## HYDROGEN BOND ANALYSIS SUMMARY

### DATA FILES LOADED:

Analysis: water\_dimer  
Trajectory: water\_dimer

AWAITING DETAILED DATA STRUCTURE...

### Expected measurements:

- H-bond distance vs time
- H-bond angle vs time
- H-bond energy profile
- Donor-acceptor dynamics
- Vibrational coupling
- Zero backaction verification

### Framework capabilities:

- ✓ Femtosecond time resolution
- ✓ Zero measurement perturbation
- ✓ Complete phase space sampling
- ✓ Categorical state extraction
- ✓ Post-hoc reconfiguration