

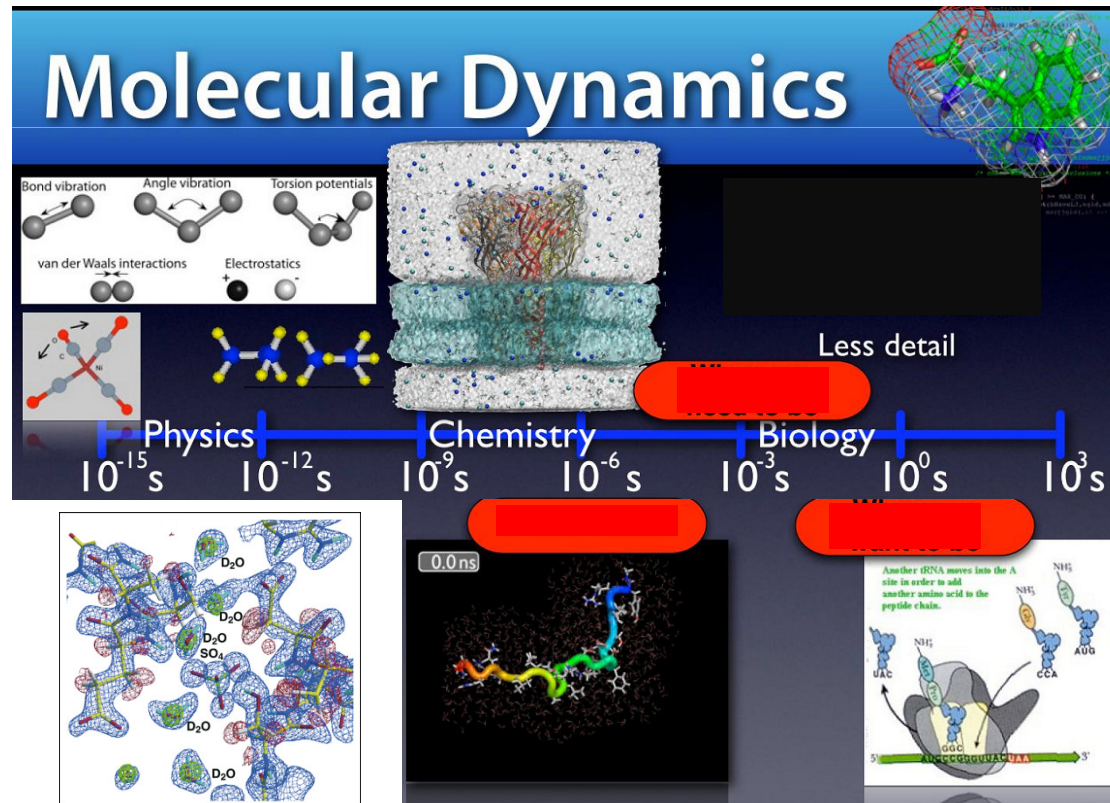
Length and time scales in Neutron Scattering

In neutron spectroscopy we talk about molecular motions and dynamics by distinguishing between:



“Fast” dynamics = “high” frequency \Rightarrow timescale of the dynamical process \sim ps range

“Slow” dynamics = “low” frequency \Rightarrow timescale of the dynamical process \sim ns range



Dynamics by Quasi and INelastic Neutron Scattering

“Fast” dynamics \Rightarrow (sub) ps range \Rightarrow rather energetic neutrons (thermal/hot)



Small *angle* \Rightarrow Brillouin spectroscopy (BRISP)

Wide *angle* \Rightarrow conventional INS (e.g. IN4, 3-axis spectrometers as IN1, IN8)

“Slow” dynamics \Rightarrow (>10 ps) \Rightarrow approaching the ns range \Rightarrow cold neutrons

High resolution



Backscattering spectrometers (e.g. IN16, IN13)

ToF cold neutron spectrometers (e.g. IN5)

Spin echo (high resolution measurements in the time domain)