

# Liquid Surface Scattering at APS

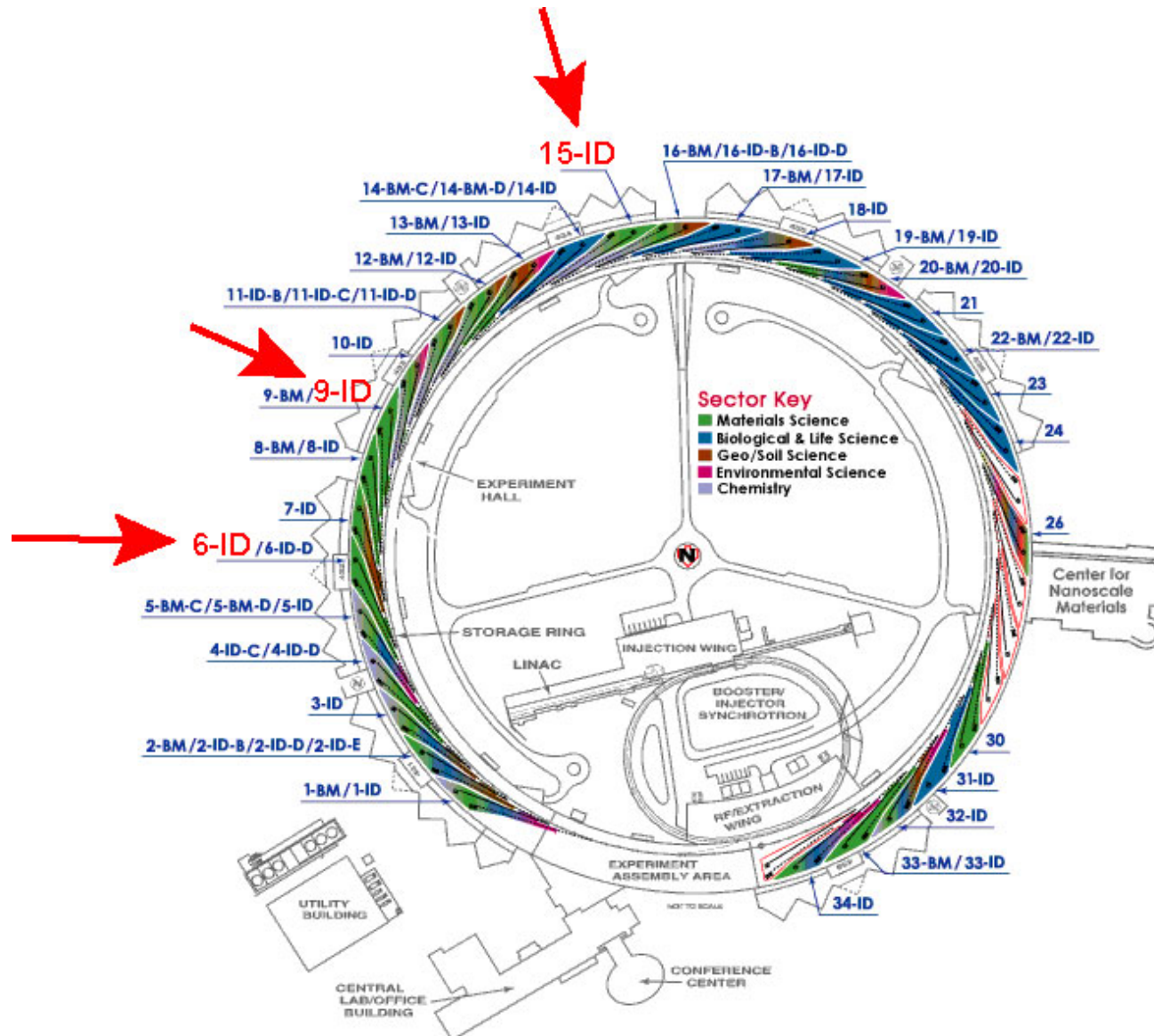
**“2007 School for Liquid Surface X-ray Scattering:  
Theory and Experimental Methods”**

Nov 7, 2005

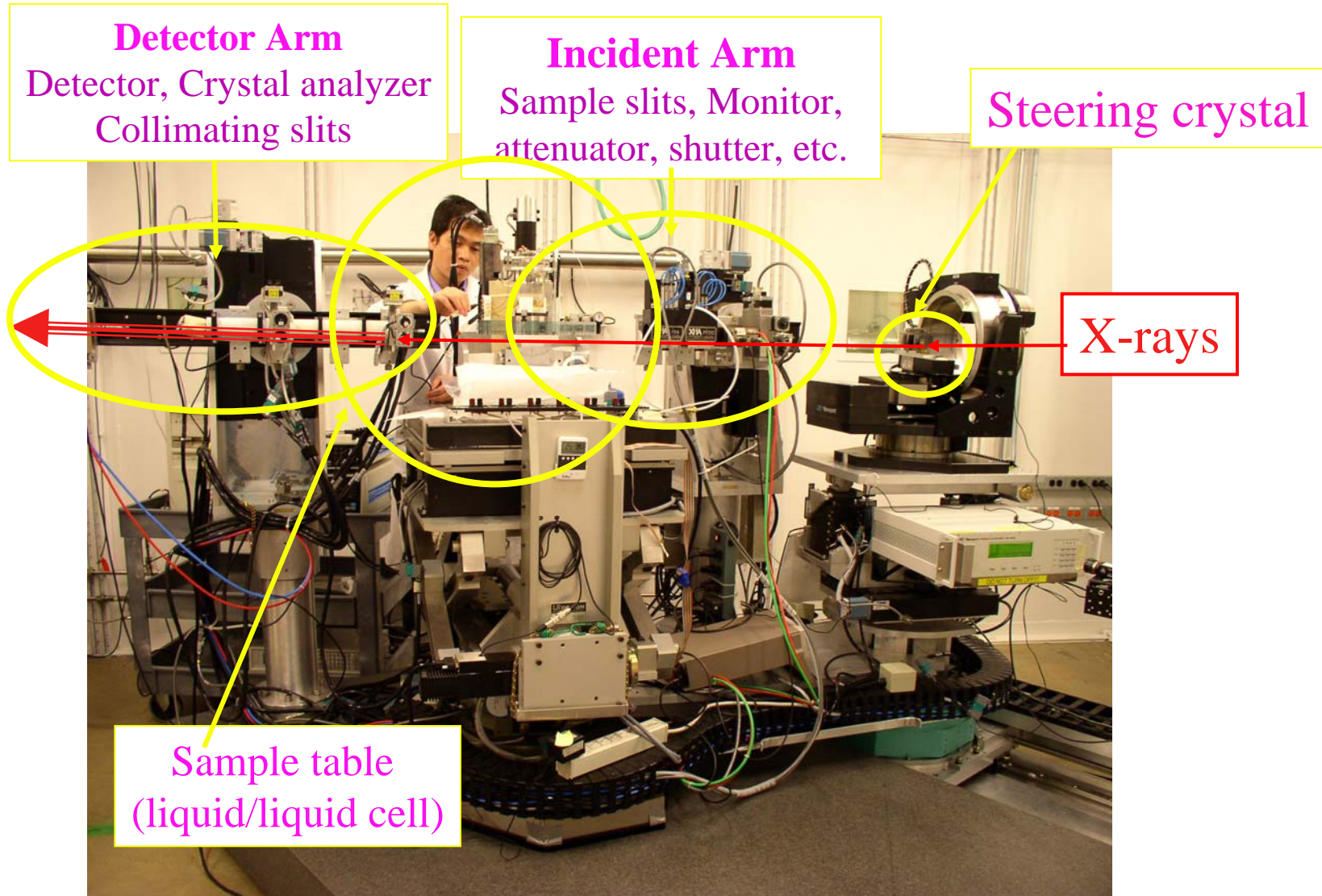
# Main X-ray LSS Facilities Around the World

- APS, ANL, Argonne, USA (6-ID, 9-ID, 15-ID)
- NSLS, BNL, Brookhaven, USA (X22B, X19C)
- ESRF, Grenoble, France (ID10B @ Troika, ID15A)
- DESY, Hamburg, Germany (BW1 @ Hasylab)

# Dedicated Liquid Surface Instruments at APS



# Liquid surface spectrometer at APS



# General specs of three LSS beamlines

6-ID:

Energy Range	Monochromator Type	Resolution	Flux	Beam Size (horiz x vert)	
				Unfocused	Focused
3.2-38 keV	Si 111	$1 \times 10^{-4}$	$7.1 \times 10^{12}$ @8 keV	1.5mm x .7mm	1500 $\mu$ m x 150 $\mu$ m

9-ID:

Energy Range	Monochromator Type	Resolution	Flux	Beam Size (horiz x vert)	
				Unfocused	Focused
4.5-22.5 keV	Si 111	$1 \times 10^{-4}$			600 $\mu$ m x 200 $\mu$ m
8.9-67.5 keV	Si 333	$1 \times 10^{-4}$			600 $\mu$ m x 200 $\mu$ m

15-ID:

Energy Range	Monochromator Type	Resolution	Flux	Beam Size (horiz x vert)	
				Unfocused	Focused
6-30 keV	Diamond 111	$1 \times 10^{-4}$		2mm x .5mm	$\mu$ m x 200 $\mu$ m

# Surface Science on Liquids at APS

- **Surface structure of liquids (15-ID, 9-ID):**  
liquid metals, binary organic mixtures, ionic liquids, liquid-liquid interfaces
- **Non-biological Langmuir films (15-ID, 6-ID, 9-ID)**
- **Biological Langmuir films (15-ID, 6-ID, 9-ID)**
- **Metal particles at air-liquid interfaces (15-ID):**  
gold particles at air-water interface
- **Structure of buried interfaces (9-ID):**  
organic films at mercury-silicon interface
- **Induced crystallization under Langmuir monolayers (6-ID)**
- **Geosciences (9-ID):**  
clay colloids