中国原子能科学研究院
CHINA INSTITUTE OF ATOMIC ENERGY

China Advanced Research Reactor

The China Advanced Research Reactor (CARR) at China Institute of Atomic Energy (CIAE) is expected to become critical in 2010, which is a tank-in-pool inverse neutron trap type reactor equipped with a liquid hydrogen cold source.

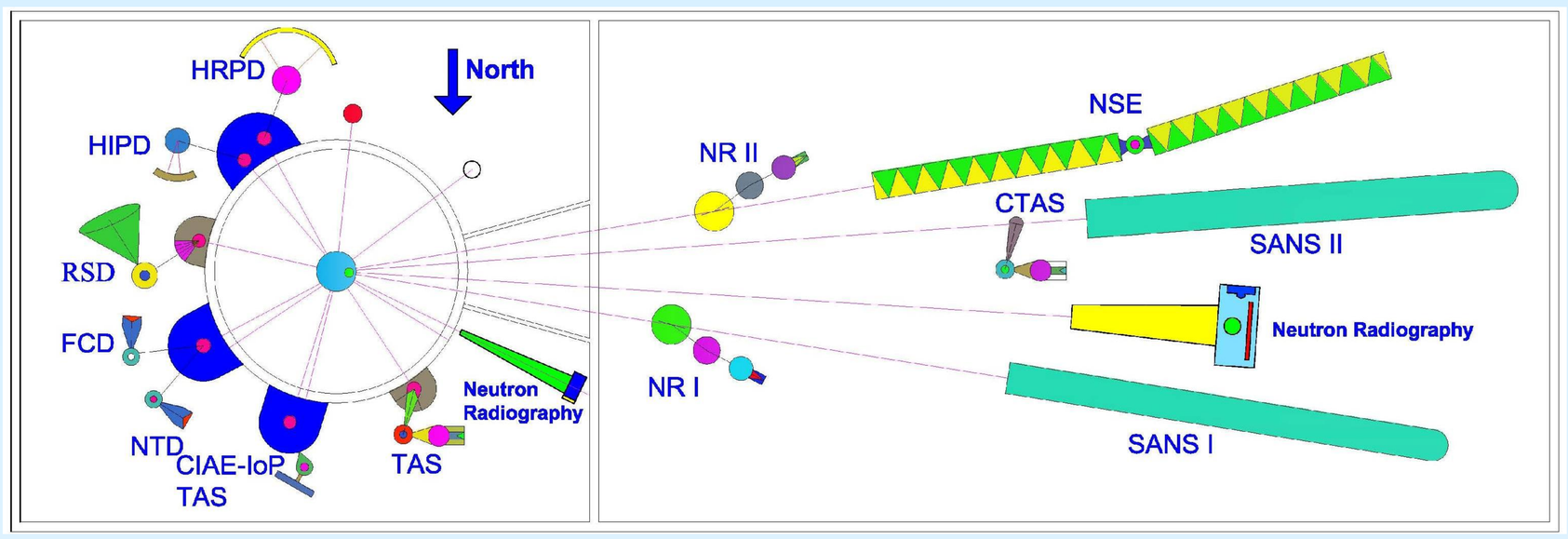
Key Parameters of CARR

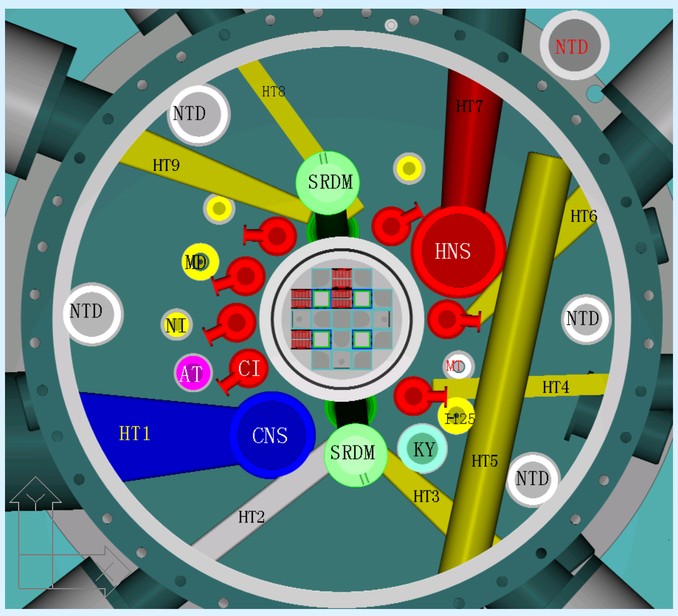
Power (MW)	60
Max undisturbed thermal neutron flux ($n \cdot cm^{-2} \cdot s^{-1}$)	$8x10^{14}$ (at heavy-water reflector)
horizontal beam tubes	9
vertical channels	25
U^{235} enrichment/ (wt%)	19.75

Multipurpose Research Reactor

☐Neutron scattering---*the major research program at CARR.*

1) Instrument:





Layout of Experimental Channels

PHASE I (under construction):		PHASE II (future):
Diffractometer	**Industrial Application**	NSE Spin Echo Spectrometer
HRPD/HIPD Powder diffractometer	RSD Residual stress diffractometer	CTAS Cold triple-axis spectrometer
FCD Four-circle diffractometer	NTD Texture diffractometer	BS Backscattering spectrometer
Large-scale structure diffractometer	Neutron imaging	
SANS Small-angle neutron scattering	**Spectrometer**	
NR Neutron reflectometer	TAS Triple-axis spectrometer	

2) Sample environment (under construction): top loading CCR (0-500K), high temperature furnace(0-1600℃), magnet(0-300K,7 T) and high pressure (200MPa)

☐Radioisotopes production

Vertical channels with different diameters and different neutron flux levels and the automatic and processing transportation systems can be used for production of radio-isotopes in industrial scale.

☐Neutron transmutation doping (NTD) silicon

☐Neutron activation analysis (NAA) etc

NAA will reach the sensitivity up to 10^{-6}～10^{-9} gram for most chemical elements.