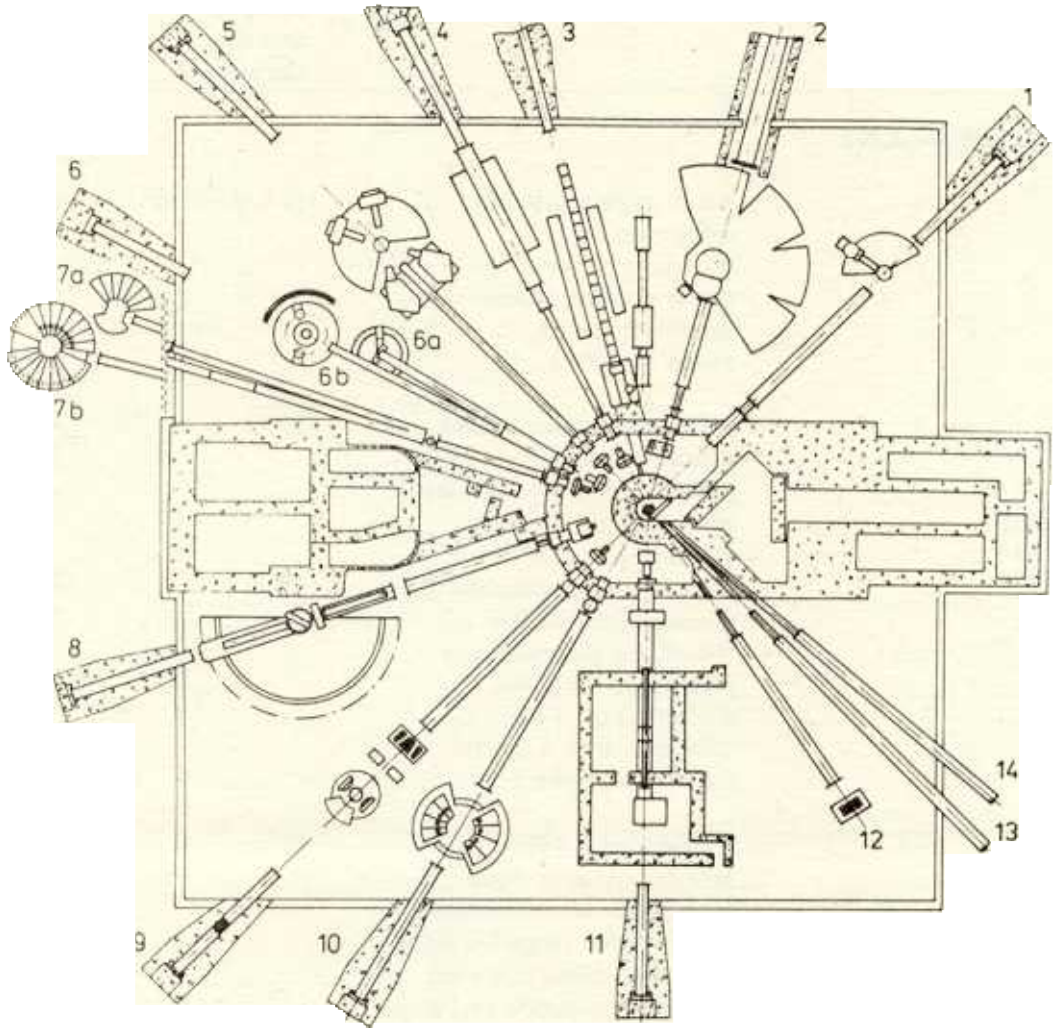
Schematical layout of IBR-2 experimental facilities



Beam line	Spectrometer
1	Diffractometer on ideal crystals **"DIFRAN"**
2	Direct geometry spectrometer **"DIN-2"**
3	Ultracold neutrons channel **"UCN"**
4	Small angle scattering diffractometer **"MURN"**
5	High resolution Fourier diffractometer and powder diffractometer for time-resolved studies **"DN-5"**
6A	Single crystal diffractometer **"DN-2"**
6B	Single crystal diffractometer with pulsed magnetic field **"SNIM"**
7A	Texture diffractometer **"NSVR"**
7B	High resolution inverted geometry spectrometer **"NERA"**
8	Polarized neutron spectrometer **"SPN"**
9	Neutron reflectometer (project) **"REFLEX"**
10	Inverted geometry spectrometer **"KDSOG"**
11, 12	Test beams

Neutron Spectrometers at IBR-2 Reactor

Spectrometer	Beam No.	Applications	Thermal neutron flux on the sample	Resolution range
DIFFRACTOMETERS				
"MURN"	4	Small angle scattering diffractometer. Structure of inhomogeneous systems, macromolecules, alloys, range 10–1000Å.	$(0.6\text{–}3.7)\times10^7$	$0.007\leq Q\leq 0.7$Å $\Delta Q/Q=0.04\text{–}0.18$
"DN–5" (project to be put into operation in 1992)	5	a)High resolution Fourier diffractometer for powders (HRFD). "Ab initio" studies of low symmetry structures.	10^7	$\lambda=0.9\text{–}12$Å $\Delta d/d=5\times10^{-4}$Å at d=2Å
		b)Powder diffractometer for time-resolved studies. Transition phenomena in solids with temporal resolution ca. 1 sec (300 μsec with a special detector assembly).	5×10^7	$\lambda=0.9\text{–}12$Å $\Delta\lambda=0.04$Å
"DN-2"	6A	Single crystal diffractometer. Atomic structures,phase transitions,etc. Temperature range 5–1000K. Real time diffraction with temporal resolution ca.1 min.	10^7	$\lambda=1.2\text{–}20$Å $\Delta\lambda=0.05$Å $\Delta d/d=0.01$, for $\Theta=80°$, d=2Å $\Delta d/d=0.1$, for $\Theta=10°$, d=60Å
"SNIM"	6B	Single crystal diffractometer. The pulsed (1ms) magnetic field on the sample is up to H=25T. Magnetic structures and phase transitions.	4×10^6	$\lambda=0.8\text{–}20$Å $\Delta\lambda=0.04$Å
"NSVR"	7A	Texture diffractometer. Texture analysis of metals, minerals and ceramics. Short range order studies in glasses and liquids.	10^6	$\lambda=0.8\text{–}7.6$Å $\Delta\lambda=0.015$Å

INELASTIC SCATTERING SPECTROMETERS

"DIN-2"	2	Direct geometry spectrometer, a reactor-phased chopper with curved slits, a sample area up to 200 cm^2. Atomic dynamics of metals, alloys and liquids.	2.5×10^5	δE=0.5–120meV $\Delta E_o/E_o$=4–10%
"NERA"	7B	High resolution inverted geometry spectrometer. Stochastic motion of atoms and molecules. Atomic and magnetic dynamics, phase transitions.	4.6×10^6	δE=0–500meV ΔE/E=2–6% (inelastic) ΔE=40–600μeV (quasielastic)
"KDSOG"	10	Inverted geometry spectrometer. A sample of up to 200cm^2 in area, 5–500K, 0–4kbar. Atomic and magnetic dynamics.	6.6×10^6	δE=1–300meV ΔE/E=5–14%

SPECIAL SPECTROMETERS

"DIFRAN"	1	Diffractometer on ideal crystals Neutron interferometry, coherent lengths.	1.9×10^6	λ=0.2–4Å $\Delta\lambda$=0.04Å
"UCN"	3	Investigations with ultracold neutrons of the surface properties of magnetic and non-magnetic materials.	400 n/s	Range λ=700–2500Å
"SPN"	8	Polarized neutrons spectrometer (p$\geq$94%). Magnetic field on a sample is up to 6000 Oe. Study of surface phenomena, internal fields and inhomogeneities in magnetic and superconducting materials.	2.5×10^5	$\Delta\lambda$=0.03Å λ=0.8–10Å
"REFLEX" (project)	9	Neutron reflectometer. Surface and interfacial phenomena studies by polarized and unpolarized neutron specular reflection	2.5×10^5	λ=0.5–15Å $\Theta_{grazing}=(2\text{–}12)\times10^{-3}$rad $\Delta\Theta=2\times10^{-4}$rad

Notes: 1) The average over time neutron flux (n/cm^2 /sec) (column 4) was measured by activation of a golden foil, which replaced the sample.

2) Accepted notations: λ is the neutron wavelength; Q is the scattering vector length ($\mathbf{Q}=\mathbf{k}-\mathbf{k}_o$); Δ - the resolution of spectrometer over the corresponding parameter; E_o and E the energy of the neutron before and after scattering, respectively; δE is the neutron energy change per scattering event.