It is proposed to continue the successful studies of photoproduction of neutral mesons, which are underway at Bonn University since 1999 using the tagged photon beam of the ELSA accelerator. These studies aimed at looking for "missing" resonances, which cannot be extracted from the pion-nucleon data because their small πN coupling, are complementary to experiments on πp scattering and are anticipated to give a new valuable contribution to spectroscopy of nonstrange baryons.

The experimental tool for studying these topics is the systematic measurement of photoproduction of single and multiple mesons off proton and neutron (with the use of a deuterium target) in various kinematical conditions. The experimental program is based on the unique combination of a photon beam with energy covering the completed resonance range and high resolution photon spectroscopy in energy and angle, over the full solid angle. The instrumentation kernel consists of

1) the multi-GeV beam of ELSA,

2) The multi-photon detector Crystal Barrel, especially being combined with the TAPS spectrometer, forms a unique detector of neutral and charged particles having almost 4π acceptance and excellent energy and angular resolution for the final-state particles.

3) circularly polarized photons which are at disposal of experimentalists, and linearly polarized photons which can also be produced by coherent bremsstrahlung off a diamond crystal.

With the use of this instrumentation, a number of excellent experiments was carried out at the ELSA accelerator during the period from 2000 till 2003. They include the study of baryon resonances decaying into $\Delta(1232)$ in the reaction $\gamma p \to \pi^0\pi^0 p$, the investigation of photoproduction of η- and η'-mesons from the proton and deuteron, the search for new baryonic resonances in the reaction $\gamma p \to \pi^0\eta p$, the first exploratory studies of N^* and Δ^* parity doublets in the baryon spectrum, the experimental study of the in-medium properties of the $S_{11}(1535)$ resonance, *et al.* Processing and analysis of a huge volume of obtained data is in progress now, first articles will be published in 2003.

After completion this series of experiments, the Crystal Barrel will be moved to another (DGH) beam-line. The main motivation of this is a necessity of upgrading setup with the purpose to widen its experimental capability. Since polarization of beam and target play a key role in disentangling the high-mass spectrum of N^* and Δ^* resonances and different combinations of beam and target polarization provide the tools to identify different partial wave contributions, a new polarized proton (deuteron) target compatible with the Crystal Barrel in sizes of a working volume and of a refrigerator system is under development now. Another advantage which will be got after moving the experimental setup to the DGH beam-line is a capability to combine the Crystal Barrel with the Bonn magnetic spectrometer; being set at zero degree (with a bore for passage of the photon beam) this spectrometer will be used for detection of charged particles and triggering, mainly in threshold reactions. The high momentum and position resolution allows one to use a high intensity untagged bremsstrahlung beam because in selected reactions the photon energy can be reconstructed from the complete observation of two body final state. In another mode of operation, this spectrometer will be used to detect electrons scattered at small angles in electroproduction experiments.