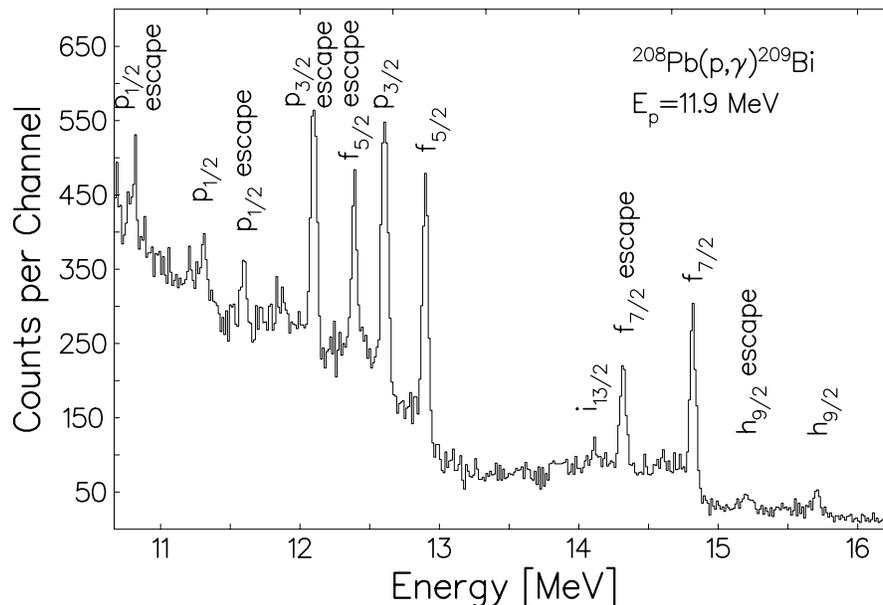


# HIGH RESOLUTION MEASUREMENT OF THE $^{208}\text{Pb}(p,\gamma)$ CAPTURE REACTION UP TO $E_\gamma = 19$ MeV

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High-energy  $\gamma$ -rays produced by the  $^{208}\text{Pb}(p,\gamma)$  capture reaction were measured with the AFRODITE germanium-detector array at iThemba LABS. The measurements were performed at 7 different beam energies in a range from 11.3-to-14.8 MeV. The use of HPGe clover instead of NaI [1] detectors was crucial, since the energy resolution (FWHM  $\sim 50$  keV) was improved by more than a factor of 10 in the  $\gamma$ -ray energy range between 10 and 19 MeV. Proton captures into different single-particle states in  $^{209}\text{Bi}$  were thus clearly separated (see figure below), most notably for the  $i_{13/2}$  high-spin state. The measured excitation-functions [2] are in very good agreement with the predictions of the direct-semi-direct model [3], including captures to the  $i_{13/2}$  state, for which the previous agreement had been poor.



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