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First detailed structure information on the r-process path nucleus ^{63}Fe A. BALUYUT, U. of Notre Dame, H. MACH, Uppsala U., E. RUCHOWSKA, SINS, Swierk, U. KOESTER, ILL, Grenoble, L.M. FRAILE, U. Complutense Madrid, H. BRADLEY, U. of Sydney, R. BOUTAMI, CSIC Madrid, N. BRAUN, CH. FRANSEN, U. of Cologne, E.M. REILLO, CSIC Madrid, V. UGRYUMOV, NPI, Rez — The nucleus ^{63}Fe is located exactly at the point of transition between lighter Fe isotopes which show spherical structures and heavier Fe, where a sudden increase in quadrupole collectivity is manifested from lowering of the first excited 2^+ states in the even Fe nuclei. Very little is actually known on the exotic neutron-rich nuclei in this region. A substantial modification of the information on the nuclear structure of ^{63}Fe and nuclei in its vicinity was obtained from a fast timing study conducted at the ISOLDE facility at CERN where levels in ^{63}Fe were populated from the beta-decay of ^{63}Mn. The new level scheme of ^{63}Fe includes 21 gamma-transitions and 10 excited states. Although ^{63}Fe seems to be understood in a shell model picture, a clear departure from spherical sequence is observed. From the measured logft values, gamma-ray branching ratios, and level half-lives in the ps range, we deduce spins and parities of $1/2^-$, $3/2^-$ and $5/2^-$ for the lowest states in ^{63}Fe which represent an inverted sequence in comparison to the heavier (and spherical) $N = 37$ isotones, namely ^{65}Ni and ^{67}Zn.

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