

## **1. Shapes and shape-related structures of nuclei**

Shape coexistence; Shape phase-transitions; E0-transitions and nuclear shapes; E $\lambda$  and M $\lambda$  transitions and their connection with nucleon density and current distribution, shapes from quasiparticle excitations.

## **2. Nuclei without axial symmetry**

Gamma bands and staggering; Coupling of quasiparticles to the collective triaxial degrees of freedom; Higher multipolarity shape-degrees of freedom, specific physics goals today, universal magic numbers, molecular symmetries, MCSM.

## **3. Coulomb excitation**

## **4. Nuclear ab initio approach**

New results; Links with other theoretical approaches; Ab initio methods applied to increasingly growing mass nuclei; Comparisons with Experiment

## **5. Super-heavy nuclei**

Latest experimental results; Present status of theoretical modelling; New directions; New concepts of magic numbers for superheavy nuclei.

## **6. Clustering in nuclei**

Nucleonic densities, role of pairing, quarteting, alpha clusterization, dynamics of cluster emission and cluster transfer

## **7. Exotic nuclei**

Nuclei at the drip-lines; Specific structural signals: shape-staggering at the proton drip-lines; What's new at the N=Z line; Mirror symmetry; Proton-neutron pairing.

## **8. Effective electromagnetic operators**

Fundamental, realistic and empirical determination of effective charges and comparison to the recent experimental data.

## **9. Energy Density Functional Theory**

Symmetry restoration and projection techniques; Predicted nuclear structure effects and comparison with experiment, new results concerning exotic symmetries.

## **9. Nuclear excitations as a function of excitation energy and angular momentum**

Decay modes; Axial symmetry isomerism: K-isomers, yrast trap isomers, n-particle - n-hole excitations; Giant & Pygmy resonances; E1-collectivity; Extreme elongations; Instrumentation; Single-particle structures; Transfer reactions

## **10. New isomeric decay modes**

## **11. Highlights from large scale facilities and laboratories**

(ISOLDE, GANIL, JYFL-ACCLAB, ALTO, ILL, LNL, HIL, FAIR, FRIB, ANL, TRIUMF, RIKEN, RCNP)

## **12. New results for neutron rich heavy nuclei**

Focus on multinucleon-transfer reactions (MNT).

## **13. Nuclear Ground State Properties: New Methods and Results**

Masses, Spins, Moments; Precision mass spectrometry; Laser techniques, laser trapping for precision studies; Links with theory; Decay spectroscopy.

## **14. Fission and nuclear structure**

Shape symmetries and nuclear fission; Fission barriers, saddle points and related geometry

## **15. Specific new results in A < 60 nuclei**

New super-strong shell-effects; The Sr-Zr-Mo transition region; Other news ...Clustering in nuclei  
Fission