Argonne Nuclear Data Program

Filip G. Kondev
NE Division

Program Overview (FY09)

- **Nuclear Data Compilations & Evaluations (90 %)**
  - ✓ nuclear structure & decay data compilations & evaluations for the International NSDD network (ENSDF & XUNDL)
  - ✓ decay data evaluations for DDEP & IAEA-CRP on *"Updated Decay Data Library for Actinides"*
- **Complementary ND Research Activities (10 %)**
  - ✓ basic and applied nuclear physics & astrophysics
- **Effort & Funding: 1.0 FTE staff & 0.4 FTE post-doc**

Compilations & Evaluations

- **ENSDF & XUNDL**
  - ✓ completed **A=204** – reviewed and ready for publication; participated in the **A=84** evaluation effort
  - ✓ work in progress **A=177** (FGK), **207** (with S. Lalkovski, Bulgaria), and **209** (with G. Mukherjee, India)
  - ✓ reviewed **A=133** – follow up with the evaluator – visit to ANL at end of Nov. 2009
  - ✓ compilations for XUNDL: **Phys. Lett. B & J. Phys. G** (with B. Singh, McMaster University) ~ 40 submitted
- **Evaluations for IAEA-CRP on "*Updated Decay Data Library for Actinides*" & DDEP collaboration**
  - ✓ work is continuing on ^{243}**Cm** & ^{245}**Cm** – incorporate new results from measurements carried out at ANL
- **Other (related) Activities**
  - ✓ ENSDF consultant meeting at IAEA – Nov. 2008
  - ✓ TAGS consultant meeting at IAEA – Jan. 2009
  - ✓ NSDD meeting at IAEA – March 2009
  - ✓ Bucharest Workshop – April 2009

Nuclear Data Research Activities

❑ Nuclear Structure studies using Gammasphere & FMA at ANL

✓ complement ANL evaluation activities on the subject - completed studies of **^{174}Lu** (gsfma112 collaboration) – Phys. Rev. C80 (2009) 014304

✓ new results on **^{248}Cm & ^{249}Cf** using DIC and MNT - emphasis on actinide and SH nuclei – mqp calculations using deformed WS potential, including pairing & spin-spin residual interactions

✓ properties of **^{77}Ge** using ^{76}Ge(^{13}C,^{12}C) of relevance to neutrinoless double beta decay (with J.P. Schiffer & B. Kay (ANL-PHY) and C. Chiara (ANL-NE)) – published in Phys. Rev. C 80 (2009) 017301 - **XUNDL**

❑ Development of Argonne Total Absorption Gamma-ray Spectrometer - ANL LDRD/DCG funding – C.J. Chiara, F.G. Kondev (NE) & K. Lister (PHY)

✓ emphasis on Nuclear Data needs for neutron-rich FP of relevance to Advanced Fuel Cycle, Homeland Security & Nuclear Astrophysics applications – will utilize the state-of-the-art CARIBU RIB facility at ANL

❑ **Standardization of ^{177m}Lu decay data** – calibration standard for the gamma-ray tracking detectors – also of relevance to interpretation of the super-inelastic cross section data

❑ **Decay studies of selected actinide nuclei** (with I. Ahmad & J. Greene, ANL-PHY & A.L. Nichols & M.A. Kellett, IAEA) **-** part of the ANL commitment to the IAEA-CRP on *"Updated Decay Data Library for Actinides"*

studies of **233Pa, 237Np, 240Pu, 242mAm, 243,244,245,246Cm & 249,250Cf**