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Member of the US Nuclear Data Program

Argonne Nuclear Data Program

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Program Overview (FY06)

❑ Nuclear Data **Compilations & Evaluations** (80 %)

- ✓ nuclear structure & decay data compilations & evaluations for the International NSDD network (ENSDF & NDS)
- ✓ specialized decay data compilations and evaluations for the DDEP collaboration & IAEA CRP on "*Updated Decay Data Library for Actinides*"

❑ Complementary ND **Research** Activities (20 %)

- ✓ basic and applied nuclear physics & astrophysics
- ✓ commitments to IAEA CRP on "*Updated Decay Data Library for Actinides*"

❑ Effort & Funding - ~0.8 FTE from US DOE/OS/ONP

2006 USNDP Meeting, BNL, November 7-9, 2006

Compilation & Evaluation Activities

☐ Evaluations for the INSDD Network (ENSDF)

- ✓ Incorporated reviewer's comments to $A=201$ - submitted to the Editor of *NDS* for publication
- ✓ Completed $A=200$ evaluation in collaboration with Dr. S. Lalkovski, Sofia University/ [University of Brighton, UK](#) – submitted to the Editor of *NDS*
- ✓ Evaluated (updated) ^{203}Pt - submitted to ENSDF

☐ Evaluations for the DDEP Collaboration

- ✓ one nuclide (^{206}Tl) was evaluated; one nuclide was reviewed (^{239}Pu)

☐ Evaluation for the IAEA-CRP on “Updated Decay Data Library for Actinides”

- ✓ Evaluations on ^{246}Cm & ^{206}Hg are near completion

☐ Horizontal Evaluations

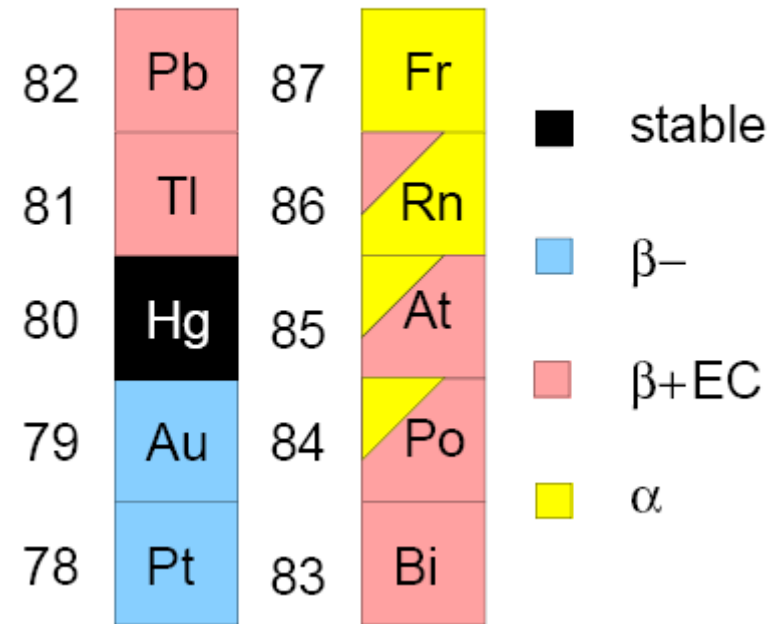
- ✓ Evaluation of properties of **K-Isomers in deformed nuclei** continues in collaboration with scientists from ANU, Australia

related activities →

☐ Lectured at International ND Training Workshops

- ✓ two lectures at the **IAEA/ICTP** organized workshop in **Trieste**
- ✓ two lectures at the **DDEP** organized workshop in **Saclay**

$A=200$



Complementary Research Activities

- ❑ Decay Spectroscopy of **Actinide Nuclei** – part of the ANL commitment to the **IAEA-CRP** on “*Updated Decay Data Library for Actinides*”
 - ✓ α -, β - and γ -ray decay studies (singles and coincidences) of ^{233}Pa , ^{237}Np , ^{240}Pu , $^{242\text{m}}\text{Am}$, $^{243,244,245,246}\text{Cm}$ & $^{249,250}\text{Cf}$ using unique mass separated sources
 - ✓ results on ^{240}Pu , ^{244}Cm , ^{246}Cm & ^{250}Cf have been published
- ❑ Spectroscopy of Nuclear **K-Isomers** in the **A~180** and **250** mass regions
 - ✓ completed studies of ^{174}Lu ; data analysis on $^{185,187}\text{Re}$ is continuing; new results on $^{246,248}\text{Pu}$
 - ✓ partial results on ^{174}Lu , $^{170,172}\text{Er}$, $^{250,254}\text{No}$ have been published
 - ✓ unique results on shell-model isomers near ^{132}Sn , including decay spectroscopy of **FP**
- ❑ Studies of $^{186\text{m}}\text{Re}$ of relevance to **nuclear astrophysics** ($^{187}\text{Re}/^{187}\text{Os}$ clock) – under the auspices of the USNDP Nuclear Data for Astrophysics Task Force
 - ✓ the **experimental part** is almost complete – detailed structure of levels above the 8+ isomer ($T_{1/2} \sim 10^5$ y) is revealed - will study the **impact of new data on the isomer production (and destruction) cross-sections** - new cross-section measurements are envisioned (in collaboration with TUNL) – initiated **compilation & evaluation of data for all nuclear cosmochronometers**