

Lawrence Livermore National Laboratory

LLNL Report



Neil Summers

LLNL Personnel Slide

USNDP staff changes

- Dave Brown (staff position) left LLNL for BNL, August 2011
- Nidhi Patel (Post-Doc) joined LLNL, October 2010
 - part time on ARRA funding

Staff	FTE			Heads
	USNDP	ARRA	NNSA	
Permanent	0.37	0.58	~7	12
Temporary	0	0.29		1
Professional	0.01	0.04		1
Total	0.38	0.91	~7	14
Heads	3	2	12	



New Data Format Effort Led by LLNL

- GND now translates nearly all of ENDF-6. New additions:
 - Resonances
 - Covariances
 - Incident neutrons, gammas
 - Incident charged particles are nearly complete
 - Made improvement to existing structure
 - Added translation from xml into Fudge python classes
- Associated tools have also been developed:
 - Fudge was refactored to reflect GND structure
 - New plotting, processing, resonance reconstruction utilities
- GND is portable: translates into xml, HDF5, and to ENDF-6
- Bug fixes
- First full release (GND-v1.0) is now available!
- 'EAF' Activation library was fully translated into GND
 - will be released in the next week



Nuclear Data Efforts at LLNL

- ENDL2011 data library compiled
 - Plan to convert library to new GND format in FY12
 - provides good beta test for future ENDF efforts
- Primary Gamma Rays
 - NA-22 effort to include EGAF data in nuclear reaction data libraries for Homeland Security uses
- Total Monte Carlo (TMC) toolset under development
 - provide improved data fitting for evaluations along with covariances



Experimental Efforts at LLNL

- Direct measurements for the neutron-induced reactions on actinides
 - Measurement of the prompt neutron and gamma emission in neutron-induced fission using the χv array
 - Neutron capture and the fission prompt gamma measurement using the DANCE array
- Surrogate cross section measurements
 - New measurements for $^{238}\text{Pu}(n,f)$, $^{240,1,2}\text{Am}(n,f)$, Y/Zr(n,g) and (n,2n)
- β -delayed neutron emission measurements for fission fragments
 - Measurements will be made for $^{144,145}\text{Cs}$, $^{105,106}\text{Nb}$, ^{137}I



Nuclear Theory Efforts at LLNL

- Continued work on surrogate reaction theory
 - Beyond Weisskopf-Ewing, realistic spin/parity distributions
 - Coherent treatment of compound nucleus formation and direct reaction channels
- Coupled-Channels investigations
 - New optical potentials
 - Effects on inelastic channels/angular distributions
- Fission
 - Event-by-event modeling with FREYA
 - Microscopic theory of fission
- Ab-initio reaction theory
 - Quaglioni received Early Career Research Program Award
 - Developing R-matrix capability for light-ion reactions

