



... for a brighter future

Status of Atomic Mass Evaluation Effort

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acknowledge comments from Y. Litvinov &
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of Energy

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AME History

□ AME plays a seminal role in all aspects of nuclear structure & astrophysics research, as well as in other areas of basic and applied nuclear physics

1955	A.H. Wapstra and J.R. Huizenga	[28]	“Isotopic masses”
1956	J. Mattauch <i>et al</i>	[50]	“The masses of light nuclides
1957	J.H.E. Mattauch and F. Everling	[29]	“Masses of atoms of $A < 40$
1960	F. Everling <i>et al</i>	[30]	“Relative nuclidic masses”
1962	L.A. König <i>et al</i>	[51]	“1961 nuclidic mass table”
1965	J.H.E. Mattauch <i>et al</i>	[31]	“1964 atomic mass table”
1971	A.H. Wapstra and M.B. Gove	[32]	“The 1971 atomic mass evaluation”
1977	A.H. Wapstra and K. Bos	[33]	“The 1977 atomic mass evaluation”
1985	A.H. Wapstra and G. Audi	[34]	“The 1983 atomic mass evaluation”
1993	G. Audi and A.H. Wapstra	[36]	“The 1993 atomic mass evaluation”
2003	G. Audi <i>et al</i>	[8]	“The AME2003 atomic mass evaluation” & NUBASE

~8-10 years on average

At the DDEP training meeting in Saclay (March 2006) G. Audi told us that new AME can be expected in CY 2008

“The black Wednesday – 4/12/2007”

an e-mail from G. Audi - April 12, 2007

“... No other evaluation of masses is planned, since I have now moved to another domain of interest (<http://amdc.in2p3.fr/bulletins/Ame-fut.txt>) ...”

“... As far as I am concerned, in agreement with the authorities in my laboratory, I have stopped the evaluation program and joined an experimental program in our lab, that is not in the field of nuclear masses....”

following (giant) resonances

- ✓ strong concern expressed by NP research communities (masses, nuclear structure & astrophysics) in US, Europe, Canada, Japan, India and elsewhere
- ✓ strong concern expressed by some of the USNDP data groups and by the IAEA-Nuclear Data Section
- ✓ concern expressed by sponsoring agencies - ONP/DOE and NSF

numerous discussions within many communities (examples below)

at ANL PHY Division seminar (January 2007), DOE/NP briefing (February 2007), JINA Workshop of Nuclear Masses (May 2007), nuclear astrophysics data meeting in Trento (May 2007), NSDD meeting in St. Petersburg (June 2007), numerous meetings and phone conversation between mass measurements group leaders (US, EU and Canada) and G. Audi; a lot of e-mail exchanges ...

What happened since then ...

- ❑ European led effort to continue AME – lead by GSI

Main aims:

- ✓ to establish a network of AM evaluators - mainly from centers that have active mass-measurement programs
- ✓ to appoint a network coordinator– a postdoctoral level position - 2 years at Orsay/2 years at GSI – 4 years effort in total (~400 k€)

Main tasks:

- ❑ Collection and evaluation of experimental data – multi-lab network
- ❑ Creation of a web-site with interactive tools which serve the community (mass calculators, mass interpolation and extrapolation, etc.), data base for experimental and theoretical masses and a literature archive.
- ❑ Publication of a regular bulletin (distributed electronically 2...4 times p.a.)
- ❑ Creation of a virtual journal on mass spectrometry for nuclear structure and astrophysical applications (latest publications, preprints, archive)
- ❑ Organization of annual working group meetings

Deliverable: AME in 2012, published in Nuclear Physics A

Recent Developments

❑ LoI presented at the Helsinki EURONS meeting (Y. Litvinov-GSI)

Name of activity (working title)		Advanced Atomic Mass Evaluation
Participants	Germany	GSI (Yu. Litvinov, F. Herfurth, H. Geissel) Justus-Liebig-Univ. Gießen (W. Plass, C. Scheidenberger) Johannes Gutenberg Universität Mainz (K. Blaum, B. Pfeiffer)
	France	Orsay (G. Audi, D. Lunney) GANIL (W. Mittig, H. Savajols)
	Finland	JYFL (J. Aysto, A. Jokinen)
	Switzerland	ISOLDE (A. Herlert)
	Sweden	Stockholm (R. Schuch)
	Great Britain	Univ. Liverpool (M. Chartier)
		Theory groups (Th. Bürvenich, H. Lenske, S. Goriely, P.H. Heenen, Z. Patyk)
Contact persons outside Europe		USA (ANL, MSU) (F. Kondev, G. Savard, G. Bollen, H. Schatz) Canada (TRIUMF) (J. Dilling) Japan (RIKEN) (A. Ozawa, T. Yamaguchi) India (Sri Sathya Sai University) (K. Venkataramaniah)

Recent Developments – cont.

- ❑ 38 JRA & 23 Network LoI submitted to the EURONS call
 - ✓ NuPECC advice was to reduce JRA to 5-7 & Networks to 6-8
- ❑ the steering committee (SSC) of the new EURONS proposals (ENSA) met with EC representatives (10/3/07 in Brussels) and reviewed the LoI (SSC meeting 10/11/2007 in Amsterdam)
 - ✓ NA14 AAME: “The SSC recognises the importance of continuing the work towards the next AAME, but sees difficulty in obtaining the necessary research position within a network activity. Therefore, it recommends that this activity be included in the programme and proposed organisational structure of **JRA39** within the new activity **N-JRA10**”
- ❑ a joint (with Theory) JRA proposal will be submitted by November 9, 2007 – Y. Litvinov (GSI) is coordinating the effort – it is envisioned to have an active network of evaluators by **Spring, 2008** and new **AAME by 2012!**