

# What's New in JATS since 1.0?

**Mulberry Technologies, Inc.**  
**Debbie Lapeyre and**  
**Tommie Usdin**

17 West Jefferson Street, Suite 207  
Rockville, MD 20850  
Phone: 301/315-9631  
Fax: 301/315-8285  
info@mulberrytech.com  
<http://www.mulberrytech.com>

Version 1.0 (April 2015)  
©2015 Mulberry Technologies, Inc.





# What's New in JATS since 1.0?

Administrivia . . . . .	1
Who We Are . . . . .	1
Who Are You? . . . . .	2
Which Tag Set(s) do you use . . . . .	2
Brace Yourselves . . . . .	3
A Brief History of JATS . . . . .	4
How JATS 1.0 <i>may</i> become JATS 1.1 . . . . .	4
Important Things about V1.0 through V1.1 . . . . .	5
Backwards Compatible . . . . .	5
If You Have Customized JATS . . . . .	6
What is New in JATS? . . . . .	6
Changes to Meet Industry Initiatives . . . . .	7
CrossRef's FundRef . . . . .	7
FundRef Elements . . . . .	8
Institution Names and Identifiers . . . . .	8
Mapping JATS Elements to FundRef . . . . .	9
FundRef Institution Data at Many Levels . . . . .	9
Realistic JATS Funding Information . . . . .	10
Institution Identifier Not Limited to Funding . . . . .	11
Identifying People . . . . .	12
New Attributes for Contributor Identifiers . . . . .	12
Josiah Carberry (a very old joke) . . . . .	13
And Here, Courtesy of CrossRef . . . . .	13
Assigning Authority Attribute . . . . .	14
Permissions and Licenses . . . . .	14
NISO Open Access Metadata and Indicators . . . . .	15
<ali:free_to_read> . . . . .	15
<ali:license_reference> . . . . .	16
Citing Data . . . . .	16
Force11 Citations for Data . . . . .	17
Force11 Joint Declaration of Data Citation Principles . . . . .	17
New Elements Requested by Force11 . . . . .	18
New Attributes Requested by Force11 . . . . .	18
New Attributes Values Requested by Force11 . . . . .	19
Sample Force11 Data Citations . . . . .	19
Improved Internationalization . . . . .	21
Ruby Formatting . . . . .	22
Ruby Markup in JATS . . . . .	23
Looking at Ruby in JATS . . . . .	23
Publishing Eras . . . . .	24
Era Does not Mean Paleozoic . . . . .	24
Easy Addition of Universal Attributes . . . . .	25
Attributes, Attributes, Everywhere . . . . .	25
Add optional Access Level attribute to all elements . . . . .	26
MathML . . . . .	26

## **What's New in JATS since 1.0?**

MathML Moves from 2.0 to 3.0 . . . . .	26
MathML 2.0 and MathML 3.0 . . . . .	27
JATS Users can Choose Either Math Model . . . . .	28
Which MathML Should You Use? . . . . .	28
Invalid MathML 3.0 Example (fine in MathML 2.0) . . . . .	29
More New Cool Elements . . . . .	29
Programs, Code, and Pseudo-code Fragments . . . . .	30
Code is not just ASCII Art . . . . .	31
A Code Example . . . . .	32
Parts of an Address . . . . .	32
JATS Address Elements . . . . .	33
Changes to Element Models . . . . .	33
Metadata Proliferates! . . . . .	34
Figure with Keywords . . . . .	34
Statements are Recursive! . . . . .	35
On-Behalf-of Grew . . . . .	37
<on-behalf-of> . . . . .	37
Richer Table Model . . . . .	37
Paragraphs inside Table Cells . . . . .	38
<volume> in Article Metadata . . . . .	39
Other Small Changes to Elements . . . . .	39
Very Mixed Citation . . . . .	40
More and Better Attributes . . . . .	40
Toggles, Toggles Everywhere . . . . .	41
Attribute Changes for <pub-id> . . . . .	41
Better Attributes for <isbn> . . . . .	42
Documentation . . . . .	42
Redesigned Tag Library Documentation . . . . .	43
Tag Libraries have New Content Too! . . . . .	43
Tag Libraries have Improved Language (we hope) . . . . .	44
So Let's Take a Look . . . . .	44
Your Turn . . . . .	44
Bye . . . . .	45
One: Debbie's Favorite Documentation Change . . . . .	45
Two: You Asked for It! . . . . .	46
How To Get JATS to Change . . . . .	46
Colophon . . . . .	47

---

## **Appendixes**

Appendix A: Super Geeky Technical Details . . . . .	1
---	---

# What's New in JATS since 1.0?

---

*slide 1*

## Administrivia

- Class end time
  - Break
  - What do you want to get out of this class?
- 

*slide 2*

## Who We Are

- Mulberry Technologies
- Tommie Usdin
- Debbie Lapeyre
- Our relationship to JATS
  - NLM's hands and advisors
  - part of the 4 JATS designers (with Jeff Beck and Bruce Rosenblum)
  - wrote, documented, maintained JATS
  - members of NISO JATS Standing Committee
  - act as Secretariat to the JATS SC

## Who Are You?

- Produce journal articles
- Produce books (print and/or eBook)
- Archive or library
- Web design
- Hosting or aggregators
- Academic
- Software development or consulting

## Which Tag Set(s) do you use

- Your own DTD or Schema
- A public one (DITA, DocBook, TEI, etc.)
- PMC DTD (pre-JATS)
- JATS
  - Archiving (Green)
  - Publishing (Blue)
  - Authoring (Pumpkin)
  - BITS (JATS for Books)
- Which JATS Version
  - NLM DTD Before 2.3
  - NLM DTD 2.3
  - ANSI/NISO JATS 1.0
  - JATS 1.1d1, 1.1d2, or 1.1d3

## Brace Yourselves

This is Going to be Dull



Standards Updates are boring

## Save The Day: Ask Questions



(Please)

## A Brief History of JATS

### (Phases mark major incompatibilities)

- Phase 1: PMC DTD and NLM DTD pre-JATS
- Phase 2: NLM DTD 1.0 through 2.3
- Phase 3: NLM 3.0 becomes JATS 1.0
  - NISO JATS Standing Committee (JATS SC) supports JATS
  - Mulberry Technologies acts as Secretariat
  - NISO comment form gathers user change requests
  - JATS through Committee Drafts 1.1d1, 1.1d2, 1.1d3
  - Future: Version 1.1d3 wins NISO approval and becomes JATS 1.1

## How JATS 1.0 *may* become JATS 1.1

### Version 1.0 to (we hope) Version 1.1

- Draft 1.1 (1.1d3) submitted to NISO for comment period
- NISO voting members request changes or clarifications
- Any requests for changes are addressed
- Newly minted JATS 1.1 submitted to NISO for a vote
- If approved, JATS becomes NISO JATS 1.1
- Then (still in phase 4) new requests are collected  
cycle starts over
- Request are addressed through JATS Standing Committee



## Important Things about V1.0 through V1.1

- Incorporate user requests from Aug 2012 to 2015
- Nothing major changes, many small improvements
- Backwards compatible (1.0 to 1.1)
- Alignment with other initiatives
- Internationalization

## Backwards Compatible



## Backwards Compatible

If two DTDs are backwards compatible

- Documents valid to DTD A are also valid to DTD A+1
- Nothing new in A+1 is *required*
- Documents valid to A+1 may contain new items, not in A, but *everything* new is optional

## If You Have Customized JATS

*If AND ONLY IF* you used the modular customization mechanism

- You bring in the new modules
- Your customizations still work
- If you want the JATS changes (in general):
  - check only what you have customized
  - JATS now matches yours; delete your over-ride
  - you don't like new JATS; stick with your over-ride
  - you want some of new JATS; update your over-ride

## What is New in JATS?

- Changes to meet Industry Initiatives
- More Internationalization
- Global attributes
- MathML 3.0
- Cool new elements
- Improved models for some elements
- New attributes
- Improved documentation (Tag Libraries)

## Changes to Meet Industry Initiatives

- CrossRef
  - FundRef
  - Assigning authority
  - @authenticated
- NISO Open Access Metadata and Indicators
- Force11 citing data sources (such as GenBank)

## CrossRef's FundRef

- *FundRef* defines a standard way to report funding sources for published research
- *FundRef Registry* is a taxonomy of standardized funder names
- Publishers deposit funding information using the standard taxonomy
- Publishers send funder information to CrossRef as part of their regular metadata DOI deposits
- All can query CrossRef by funding source and award identifier

For more information on FundRef:

<http://www.crossref.org/fundref/index.html>

## FundRef Elements

- FundRef Schema defines three elements:
  - funder\_name (name of the funding agency in FundRef Registry)
  - funder\_identifier (DOI for funding agency as given in the Registry)
  - award\_number (grant number or other fund identifier)
- JATS did not just adopt these three but JATS has elements for all 3 pieces
- A simple transform can create FundRef records out of JATS metadata

## Institution Names and Identifiers

- <funder-name> is very specific to funding
- JATS uses the names of institutions in more places than funding (<aff>, <collab>, etc.)
- So JATS added a container element <institution-wrap> that holds:
  - the name of the institution (<institution>)
  - the institution identifier (<institution-id>)

## From JATS to Other Interchange Formats



## Mapping JATS Elements to FundRef

- CrossRef <funder-name>  
created from JATS institution name <institution>
  - when that name is inside a JATS <funding-source>
  - funding-source/institution-wrap/institution
- CrossRef <funder\_identifier>  
created from JATS <institution-id>
  - when that ID is inside a JATS <funding-source>
  - funding-source/institution-wrap/institution-id
- CrossRef <award\_number> maps to JATS <award-id>

## FundRef Institution Data at Many Levels

```

...
<institution-wrap>
  <institution content-type="edu">
    University of Frostbite Falls</institution>
  <institution-id>Moo-U-41</institution-id>
</institution-wrap>
<institution-wrap>
  <institution content-type="dept">
    Dept of Campus Security</institution>
  <institution-id>dept-42s</institution-id>
</institution-wrap>
<institution-wrap>
  <institution content-type="dept">
    Dept of Moose and Squirrel Security</institution>
  <institution-id>rcky-n-bllw</institution-id>
</institution-wrap>
<institution-wrap>
  <institution content-type="office">
    Office of the Acting Dean</institution>
  <institution-id>bad-actrs-inc</institution-id>
</institution-wrap>
...

```

## Realistic JATS Funding Information

```
<funding-group>
<award-group>
<funding-source>
<institution-wrap>
<institution content-type="laboratory">Massachusetts Green High Performance
Computing Center</institution>
</institution-wrap>, operated by

<institution-wrap>
<institution-id institution-id-type="Ringgold">1846</institution-id>
<institution-id institution-id-type="ISNI">0000 0001 2170 1429</institution-id>
<institution content-type="university">Boston University</institution>
</institution-wrap>,

<institution-wrap>
<institution-id institution-id-type="Ringgold">1812</institution-id>
<institution content-type="university">Harvard University</institution>
</institution-wrap>,

<institution-wrap>
<institution-id institution-id-type="Ringgold">2167</institution-id>
<institution content-type="university">MIT</institution>
</institution-wrap>,
</funding-source>
</award-group>
</funding-group>
```

## Institution Identifier Not Limited to Funding

Here is an institution identifier inside an affiliation

```
<aff id="aff4">
<institution-wrap>
<institution>Albert Einstein Cancer Center</institution>
<institution-id institution-id-type="CrossRef">
http://dx.doi.org/10.13039/100007320</institution-id>
</institution-wrap>,
<addr-line>1300 Morris Park Avenue</addr-line>
<addr-line>Bronx, New York 10461</addr-line>
<addr-line>Telephone: 718.430.2302</addr-line>
E-mail: <ext-link ext-link-type="email"
xlink:href="aecc@einstein.yu.edu">
aecc@einstein.yu.edu</ext-link>)
</aff>
```

## Identifying People



## Identifying People

JATS uses the element <contrib-id>

- Inside <contrib>, <principal-award-recipient>, <principal-investigator>
- To hold one identifier:
  - ORCID
  - publisher's trusted identifier
  - JST identifier (Japan Science and Technology Agency)
  - NII (National Individual Identifier)
  - etc.

## New Attributes for Contributor Identifiers

- In CrossRef metadata, ORCID has an @authenticated attribute
- Boolean value (true or false)
- Attribute states that the authority associated with this ID has authenticated the value of this ID
- In JATS, <contrib-id> takes the @authenticated attribute to indicate that an issuing organization has authenticated the Identifier



## Josiah Carberry (a very old joke)

- Josiah S. Carberry (fl. 1929-?)
- Legendary imaginary Brown University professor of Psychoceramics (the study of cracked pots)
- New York Times called him “The World's Greatest Traveler” (1974)
- Yankee magazine called him “The Absent-Bodied Professor” (1975)
- Winner of an Ig Noble Prize (1991)
- There is a charitable fund at Brown (since 1955) to buy “such books as Professor Carberry might or might not approve of”

## And Here, Courtesy of CrossRef

```
<contrib>
<contrib-id contrib-id-type="orcid" authenticated="true">
http://orcid.org/0000-0002-1825-0097</contrib-id>

<contrib-id contrib-id-type="scopus">7007156898</contrib-id>

<name><surname>Carberry</surname>
<given-names>Josiah Stinkney</given-names></name>
</contrib>
...
```

(used by permission.)

## Assigning Authority Attribute

On the elements <pub-id> and <ext-link>

- New attribute @assigning-authority
- Names group responsible for identifier
- As examples:

```
<pub-id pub-id-type="doi"
  assigning-authority="figshare"...a DOI...>/pub-id>
<pub-id pub-id-type="doi"
  assigning-authority="crossref"...a DOI...>/pub-id>
<pub-id pub-id-type="doi"
  assigning-authority="shakepeare"...a DOI pointing to Lady MacBeth's con-
fession ...>/pub-id>
```

This attribute:

- Reduces the semantic overloading of the @pub-id-type, currently defined as “*Type of publication identifier or the organization or system that defined the identifier*”
- May be rare for <ext-link>, but covers the case where an <ext-link> contains a DOI

## Permissions and Licenses



# NISO Open Access Metadata and Indicators

## *NISO Access License and Indicators (ALI) NISO RP-22-2015*

- Human and machine readable metadata:
  - at the article level
  - flag says is or is not “free-to-read”
  - pointer to license terms for the use/re-use of content
- Can include embargo dates or free periods that end
- Two new elements with own namespace
  - namespace prefix = “ali”
  - URI = “http://www.niso.org/schemas/ali/1.0/”

## <ali:free\_to\_read>

- EMPTY element
- Child of <permissions>
- Flags an article as free to be read
- If not free, element not present
- Start and end dates may be present as attributes
- Repeatable, for different dates

```
<permissions>
<!-- May be read during JATS-Con -->
<ali:free_to_read xmlns:ali="http://www.niso.org/schemas/ali/1.0"
start_date="2015-04-20" end_date="2015-04-23"/>
<!-- And again on the 4th of July -->
<ali:free_to_read xmlns:ali="http://www.niso.org/schemas/ali/1.0"
start_date="2015-07-04" end_date="2015-07-04"/>
</permissions>
```

## <ali:license\_reference>

- Pointer to a public license or waiver
- Child of <license>, as a peer with <license-p>
- Optional and repeatable
- May take content or not
- Start date attribute

```
<permissions><license>  
<ali:license_ref xmlns:ali="http://www.niso.org/schemas/ali/1.0"  
start_date="2014-02-03">  
http://www.psychoceramics.org/license_v1.html</ali:license_ref>  
<ali:license_ref xmlns:ali="http://www.niso.org/schemas/ali/1.0"  
start_date="2015-02-03">  
http://creativecommons.org/licenses/by/3.0/</ali:license_ref>  
</license></permissions>
```

JATS documentation recommends moving the URL for the license from the @xlink:href attribute of <license> to a child of <license>. @xlink:href will still be available.

## Citing Data



## Force11 Citations for Data

- Data sources are things like Protein Data Bank, figshare, genome data from GigaScience, and spreadsheets
- Publishers cite data sources
  - as articles and books are cited
  - in the reference list
  - in their own list

## Force11 Joint Declaration of Data Citation Principles

States (among other principles) that:

- Data is a legitimate, citable product of research
- Data citations are as important as publication citations
- Whenever a claim relies upon data, the corresponding data should be cited
- A data citation should include a persistent method for identification
- Data citations should facilitate identification of, access to, and verification of the specific data that support a claim

(FORCE11 is a community working together in support of advancing scholarly communication.  
<https://www.force11.org>)

## New Elements Requested by Force11

- Inside citations (Force11 recommends <mixed-citation>)
- <data-title>
  - the formal title or name of a cited data source (or a component of a cited data source)
  - equivalent to <article-title>
  - may be used with <source> for hierarchical relationships
- <version>
  - full version statement (maybe only a number) for cited data or software
  - @designator attribute can hold the simple version number:  
`<version designator="16.2">16th version, second release</version>`

## New Attributes Requested by Force11

- @publication-type on citations
  - typically “book”, “journal”, “standard”
  - new value “data”
  - defined as “a dataset or other research collection such as a spreadsheet”
- @person-group-type on <person-group>
  - typically “author”, “editor”, “compiler”
  - new value “curator”
  - used for citing datasets and art

## New Attributes Values Requested by Force11

The @pub-id-type (doi, archive, isbn) gets new values for citing data:

- “accession”
- “ark”
- “handle”

## Sample Force11 Data Citations

Protein Data Bank in Europe sample

```
<ref>
<mixed-citation publication-type="data">Kollman JM, Charles EJ, Hansen JM,
<year iso-8601-date="2014">2014</year>, <data-title>Cryo-EM structure of
the CTP synthetase filament</data-title>, <ext-link ext-link-type="uri"
xlink:href="http://www.ebi.ac.uk/pdbe/entry/EMD-2700">
http://www.ebi.ac.uk/pdbe/entry/EMD-2700</ext-link>, Publicly available
from <source>The Electron Microscopy Data Bank (EMDB)</source>.</mixed-citation>
</ref>
```

## Sample Force11 Data Citations

GigaScience sample

```
<ref>
<mixed-citation publication-type="data">Zheng LY,
Guo XS, He B, Sun LJ, Pi CM, Jing H-C: Genome data from
[<ext-link ext-link-type="uri" xlink:href="http://dx.doi.org/10.5524/100012">
http://dx.doi.org/10.5524/100012</ext-link>] <source>GigaScience</source>
<year iso-8601-date="2011">2011</year>.</mixed-citation>
</ref>
```

## Sample Force11 Data Citations

Data in figshare, referenced through a DOI

```
<ref>
<mixed-citation publication-type="data">Di Stefano B, Collombet S,
Graf T. <source>Figshare</source> <ext-link ext-link-type="uri"
xlink:href="http://dx.doi.org/10.6084/m9.figshare.939408">
http://dx.doi.org/10.6084/m9.figshare.939408</ext-link>
(<year iso-8601-date="2014">2014</year>).</mixed-citation>
</ref>
```

## Sample Force11 Data Citations

Dryad Digital Repository, referenced through a DOI

```
<ref>
<mixed-citation publication-type="data">Dubuis JO, Samanta R,
Gregor T (<year iso-8601-date="2013">2013</year>). Data from:
<data-title>Accurate measurements of dynamics and reproducibility
in small genetic networks</data-title>. <source>Dryad Digital
Repository</source> doi:<pub-id pub-id-type="doi">10.5061/dryad.35h8v</pub-id>
</mixed-citation>
</ref>
```

## Sample Force11 Data Citations

GenBank Protein sample

```
<ref>
<mixed-citation publication-type="data">
<data-title>Homo sapiens cAMP responsive element binding protein 1
(CREB1), transcript variant A, mRNA</data-title>. <source>GenBank</source>
<ext-link ext-link-type="genbank" xlink:href="NM_004379.3">NM_004379.3</ext-
link>.
</mixed-citation>
</ref>
```



## Sample Force11 Data Citations

### RNA Sequence sample

```
<ref>
<mixed-citation publication-type="data">Xu, J. <etal/>
<data-title>Cross-platform ultradeep transcriptomic profiling
of human reference RNA samples by RNA-Seq</data-title>.
<source>Sci. Data</source> <volume>1</volume>:<elocation-id>140020</elocation-
id>
doi: <pub-id pub-id-type="doi">10.1038/sdata.2014.20</pub-id>
(<year iso-8601-date="2014">2014</year>).</mixed-citation>
</ref>
```

## Improved Internationalization



## Internationalization

JATS has many internationalization features including:

- name alternatives to allow a name in several scripts/languages
- affiliations can be in multiple languages too
- ability to put @xml:lang everywhere

New features in 1.1

- Ruby (the HTML5 way)
- Publishing eras

## Ruby Formatting

- Ruby is a short annotation applied to a letter, word, phrase, or name
- In display/print, Ruby annotations are placed:
  - *above* the characters they modify
  - in parentheses *after* the characters they modify
  - *to the right of* vertically set text
- Ruby textual annotations use includes:
  - Japanese (Hiragana annotations on Kanji base text)
  - Chinese Pīnyīn
  - some Korean names

## Ruby Markup in JATS

- JATS uses model for Ruby from HTML5
- One Ruby base (<rb>) followed by  
One Ruby Text Annotation (<rt>)

*ruby (rb, rt)*

- Element <ruby> allowed everywhere face markup is allowed  
both metadata and narrative text

Archiving (alone) allows the capture of Ruby Parentheses, which surround the Ruby Textual Annotation and are used by formatters that can't format vertical or marginal Ruby

## Looking at Ruby in JATS

Scotland Yard  
あのロンドン警視庁は霧の中に隠れていた。

or

ろndonけいしちょう  
あのロンドン警視庁は霧の中に隠れていた。

...  
<p>... あの<ruby><rb>ロンドン警視庁</rb>  
<rt xml:lang="en">Scotland Yard</rt></ruby>は霧の中に隠れていた。  
or  
あの<ruby><rb>ロンドン警視庁</rb>  
<rt xml:lang="ja">ろndonけいしちょう</rt>  
</ruby>は霧の中に隠れていた。 ...</p>

## Publishing Eras

- JATS defines an era as a specified range of years that is named for an event, political ruler, or characterization of the timespan.
- Modern date representations using eras are published in: Japan, Korea, China, and Vietnam
- JATS allows <era> elements inside all dates (<conf-date>, <date>, <date-in-citation>, <pub-date>, <string-date>)

## Era Does not Mean Paleozoic

- If when you hear <era> you think “mesozoic”
- Your geologic sense is fine, your culture does not describe dates using <era>
- For example, in Japan, the current era is “Heisei”
- Heisei (昭和) began in 1989 AD/CE, so the current year in this scheme is “Heisei 27”
- Here is an example of a publishing history date

```
<date date-type="received" calendar="Japanese"
  iso-8601-date="2013-07-01">
  <day>1</day>
  <month>7</month>
  <year>25</year>
  <era>昭和</era>
</date>
```

“2013” is in the Japanese era “昭和” (Heisei 25).

## Easy Addition of Universal Attributes



## Attributes, Attributes, Everywhere

User Request: Provide a parameter entity for adding *the same attribute* to every JATS element

- New parameter entity allows user to add:
  - RDFa attributes
  - CSS classes
  - xml:lang
  - or whatever to every element with a single stroke
- Current global attributes:
  - @id (the unique-in-same-document identifier)
  - @xml:base (where do I find the element)

Geek note: This actually takes *two* parameter entities, one for @id #REQUIRED and one for @id #IMPLIED)

## Add optional Access Level attribute to all elements

```
<!ENTITY % jats-base-atts
    "xml:base CDATA
    access-level (red | yellow | green)
    " > #IMPLIED
green
```

## MathML



## MathML Moves from 2.0 to 3.0

- JATS allows *either* MathML 2. or MathML 3.
- *Not* both
- A JATS user must choose

## MathML 2.0 and MathML 3.0

- The two are not the same
- MathML 2.0 has attributes left out of MathML 3.0
- MathML 3.0 enforces sequence where MathML 2.0 had OR groups
- MathML 2.0 has CDATA where MathML 3.0 has value lists
  - MathML 2.0 is loose ("blood-italic" is valid)
  - MathML 3.0 is strict ("blood-italic" is an error)

## Choices



## JATS Users can Choose Either Math Model (By choosing which tag set to use)

- Publishing Tag Sets (Blue)
  - JATS Publishing plus MathML 2
  - JATS Publishing plus OASIS tables and MathML 2
  - JATS Publishing plus MathML 3
  - JATS Publishing plus OASIS tables and MathML 3
- Archiving Tag Sets (Green)
  - JATS Publishing plus MathML 2
  - JATS Publishing plus OASIS tables and MathML 2
  - JATS Publishing plus MathML 3
  - JATS Publishing plus OASIS tables and MathML 3
- Authoring Tag Sets (Pumpkin)
  - JATS Authoring plus MathML 2
  - JATS Authoring plus MathML 3

## Which MathML Should You Use?

- MathML 3.0 if you can
- It fixes lots of the bugs in MathML 2.0
- It is *far more likely* to render properly



## Invalid MathML 3.0 Example (fine in MathML 2.0)

```

<mml:math name="Mother-Goose-Rhymes">
<mml:semantics>
<mml:mrow><mml:msub><mml:mi mathvariant="sans-serif">Q</mml:mi>
<mml:mrow><mml:mn>10</mml:mn></mml:mrow></mml:msub><mml:mo>=
</mml:mo><mml:msup><mml:mrow><mml:mrow><mml:mo>( </mml:mo><mml:mrow>
<mml:mfrac><mml:mrow><mml:msub><mml:mi>M</mml:mi><mml:mn>2</mml:mn></mml:msub>
</mml:mrow><mml:mrow><mml:msub><mml:mi>M</mml:mi><mml:mn>1</mml:mn>
</mml:msub></mml:mrow></mml:mfrac></mml:mrow><mml:mo>)</mml:mo></mml:mrow>
</mml:mrow><mml:mrow><mml:mn>10</mml:mn><mml:mo>/</mml:mo><mml:msub><mml:mi>T
</mml:mi><mml:mn>1</mml:mn></mml:msub><mml:mo>-</mml:mo><mml:msub><mml:mi>
T</mml:mi><mml:mn>2</mml:mn></mml:msub></mml:mrow></mml:msup></mml:mrow>
<mml:annotation>Hey Charlie, does an annotation really
have required content? Please get back to me before
we publish this!--Joe</mml:annotation>
</mml:semantics></mml:math>

```

## More New Cool Elements

- Programs are written in `<code>`
- Parts of an address

## Programs, Code, and Pseudo-code Fragments

- Element `<preformat>` used to be used for code
  - could't name the language
  - could't say it was executable
  - could't do programmatic syntax coloring
- New element added `<code>` defined as:
  - programming language code
  - pseudo-code
  - DTD and Schema fragments
  - tagged XML documents
  - database schema fragments

## Code is not just ASCII Art

<code> has lot of new attributes:

- @code-type (type of any non-programming example: XML tagged document, DTD, XSD)
- @code-version (version of the program or code fragment)
- @executable (yes or no)
- @language (programming or scripting language in which code is written, e.g., “javascript”)
- @language-version (version of the programming language, e.g. “3.0” for “Javascript 3.0”)
- platforms (hardware and/or software platform(s) on which the <code> runs)
- Plus all the usual suspects:
  - the formatting ones (@position, @orientation, @xml:space)
  - the typical (@id, @specific-use, @xml:base, @xml:lang)

## A Code Example

```
<code code-type="pseudocode" executable="no">
class Employee { long hours; short lunch; byte pay; }
...
foreach ( Person p in Humans ) { hisOwn( p ); }
...
rem Person A tells Person B to go out and
rem buy 1 liter of milk, and, if there are
rem eggs, to buy 10.
rem So what does Person B buy?
rem 10 liters of milk, since they had eggs.

go_out;
IF eggs=true THEN
FOR i:=1 TO 10 DO buy_milk
ELSE buy_milk;
</code>
```

## Parts of an Address

- 10 years ago, JATS considered adding element <city>, <state> and others within an <address>
- Committee said nobody would ever pay to tag them
- Welcome to the world of wonderfully useful metadata
- JATS has added new address elements:
  - <city>
  - <state>  
(Used for state, province, territory, or other political units)
  - <postal-code> (Zip code, etc.)

Not just for <address>, for locations too, such as <conf-loc> and <publisher-loc>

## JATS Address Elements

```
<address>
<addr-line>10 Downing Street</addr-line>
<city>London</city>
<postal-code>SW1A 2AA</postal-code>
<country country="GB">United Kingdom</country></address>
</address>
...
<address>
<addr-line>1600 Pennsylvania Avenue NW</addr-line>
<city>Washington</city>
<state>District of Columbia</state>
<postal-code>20500</postal-code>
<country country="US">United States of America</country
></address>
```

## Changes to Element Models

- New places for metadata
- Statements can contain statements
- Cross-references in more places
- Paragraphs in table cells
- Volume has more scope in article metadata

## Metadata Proliferates!

- JATS 1.0 had metadata for
  - articles
  - sub-articles and responses
  - acknowledgments, appendices, bios, boxed-text, notes, and sections
- In JATS 1.1, <abstract> and <kwd-group> can be used on
  - <app-group>, <chem-struct-wrap>,
  - <disp-formula> and <disp-formula-group>,
  - <fig> and <fig-group>,
  - <graphic>, <media>, <statement>,
  - <supplementary-material>,
  - <table-wrap> and <table-wrap-group>

## Figure with Keywords

```
<fig fig-type="cartoon" specific-use="just a silly">
<caption>
<title>I know this defies the law of gravity, but, you see,
I never studied law!</title>
</caption>
<abstract><p>Famous saying by Bugs Bunny as he bounces
after falling off a large cliff</p></abstract>
<kwd-group kwd-group-type="author-generated">
<kwd>Bugs Bunny</kwd>
<kwd>Looney Tunes</kwd>
<kwd>Mel Blanc</kwd>
<kwd>gravity</kwd>
</kwd-group>
<graphic xlink:href="a cute bunny picture would go here"></graphic>
<attrib>Bugs Bunny (voiced by Mel Blanc in High Diving Hare)</attrib>
</fig>
```

## Statements are Recursive!

A <statement> is a Theorem, Lemma, Proof, Postulate, Hypothesis, Proposition, Corollary, or other formal statement.

- The element <statement> can now contain the element <statement>



## Recursive Statements

```
<statement content-type="lettuce-leaf">  
<statement content-type="enigma">  
<statement content-type="mystery">  
<statement content-type="riddle"><p>Why?</p></statement>  
</statement>  
</statement>  
</statement>
```

(with apologies to Winston Churchill, who first spoke of  
“a riddle, wrapped in a mystery, inside an enigma”)

## Statement Recursion in Real Document

- The element <statement> can now contain the element <statement>
- A JATS user found a few - and spoke up

function into the indicator functions as in the following lemma.

**Lemma 3.2:** If  $f$  is a  $p$ -ary function in  $n$  variables, then

$$S_f(u) = \sum_{i=0}^{p-1} \chi_{-u}(C_f^i) \zeta_p^i.$$

**Proof:** It is straightforward using the fact that  $\mathbb{Z}_p^n$  is the disjoint union of  $i$ -supports of  $f$ .

We need the following identities for obtaining the MacWilliams duality.

**Lemma 3.3:** If  $f$  is a  $p$ -ary function in  $n$  variables, then

$$\sum_{u \in \mathbb{Z}_p^n} S_f(u) x^{n-|u|} y^{|u|} = \sum_{i=0}^{p-1} W_{C_f^i}(x + (p-1)y, x-y) \zeta_p^i,$$

and

$$\sum_{u \in \mathbb{Z}_p^n} \zeta_p^{f(u)} x^{n-|u|} y^{|u|} = \sum_{i=0}^{p-1} W_{C_f^i}(x, y) \zeta_p^i.$$

**Proof:** Let  $f$  be a  $p$ -ary function in  $n$  variables. It follows from Lemma 3.2 that

$$\begin{aligned} & \sum_{u \in \mathbb{Z}_p^n} S_f(u) x^{n-|u|} y^{|u|} \\ &= \sum_{u \in \mathbb{Z}_p^n} \left( \sum_{i=0}^{p-1} \chi_{-u}(C_f^i) \zeta_p^i \right) x^{n-|u|} y^{|u|} \\ &= \sum_{i=0}^{p-1} \zeta_p^i \sum_{u \in \mathbb{Z}_p^n} \chi_u(C_f^i) x^{n-|u|} y^{|u|}. \end{aligned}$$

The first part follows immediately from Lemma 3.1. The second part is similarly proved.



## On-Behalf-of Grew

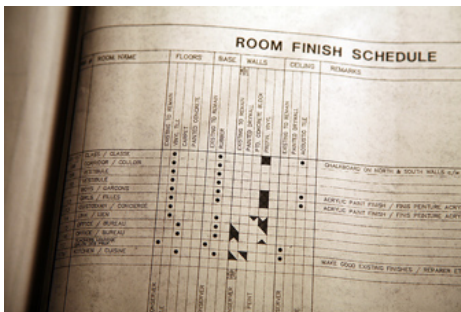
The element `<on-behalf-of>` has text and now can take

- External links (email | ext-link | uri)
- Internal links (fn | target | xref)
- The new institution identifiers (institution | institution-wrap)
- As well as all the elements it could before (face markup and such)

## `<on-behalf-of>`

```
<contrib contrib-type="bad-guys">
<name><surname>Verybad-Person</surname>
<given-names>Ima</given-names></name>
<on-behalf-of>
<institution>League for the Eradication of
Pigeon, Moose, and Squirrel</institution>
</on-behalf-of>
<role>Chief Poisoner</role>
<email>very secret, no give in XML, you fool</email>
</contrib><
```

## Richer Table Model



## Paragraphs inside Table Cells

Following the lead of many other tables models

- JATS will allow `<p>` in table cells
- For both XHTML and OASIS tables

## Table Cells Already Allowed:

- Any text
- Linebreak and horizontal rules
- Internal links (fn, target, xref)
- External links (email, ext-link, uri)
- Related material (inline-supplementary-material, related-article, related-object)
- All the face markup plus sub and sup
- Math (inline-formula, tex-math, mml:math)
- Graphics (alternatives, graphic, media, preformat, inline-graphic, private-char)
- Many inline elements (abbrev, milestone-end, milestone-start, named-content, styled-content)
- Many paragraph-level elements (array, code, chem-struct, def-list, list, disp-formula, disp-formula-group, chem-struct-wrap)
- Citations (citation-alternatives, element-citation, mixed-citation)

Whew! That ought to be enough both to capture table content and to fake your table formatting.

## **<volume> in Article Metadata**

- <volume> can repeat inside <article-meta>
- Linking attributes added to <volume-id> (and <issue-id>) so they can be external links
- New element <volume-issue-group>
  - keeps related volume and issue information together
  - may repeat to describe multiple volumes
  - follows <volume> and <issue> inside <article-meta>

## **Other Small Changes to Elements**

- Citations get new elements (both mixed and element citations)
  - <string-date> in Publishing (Archiving already had)
  - <conf-acronym>
- <list-item> elements can take a <title>

## Very Mixed Citation

```
<mixed-citation publication-type="conference">
<string-name name-style="western">
<surname>Lapeyre</surname>,
<given-names>DA</given-names></string-name>, and
<string-name name-style="western">
<surname>Usdin</surname>,
<given-names>BT</given-names></string-name>
<year>2015</year>.
<article-title>Boring Standards Updates We Have Known</article-title>.
<source>Journal Article Tag Suite Conference Preliminary
Proceedings 2015</source>: <conf-acronym>JATS-Con</conf-acronym>:
<conf-date iso-8601-date="2015-04-20">April 20, 2015</conf-date>:
Preconference Tutorial
(<uri>http://www.ncbi.nlm.nih.gov/books/NBK279667/</uri>)
</mixed-citation>
```

## More and Better Attributes

- Toggles, toggles everywhere
- Better attributes for <isbn>
- New attributes for <pub-id>  
New @pub-id-type(s) for citing data
- @specific-use added to <table>, <oasis:table>, <text-math>

## Toggles, Toggles Everywhere

(used for face markup such as bold, italic, underline)

- Attribute @toggle asks if styling of a face markup element should freeze the modification or force a different modification:
  - “no” — the emphasized text remains in the requested style, no matter what the surrounding text does
  - “yes” — If the surrounding text is set to the same emphasis style, the text within this element will change to another emphasis style, so that the text will always be typographically distinct from its surroundings
- <italic> will default to “yes”
- <roman> will default to “no”
- On all other face markup elements, @toggle will be optional

Note: New typographic emphasis element <fixed-case> *does not toggle*.

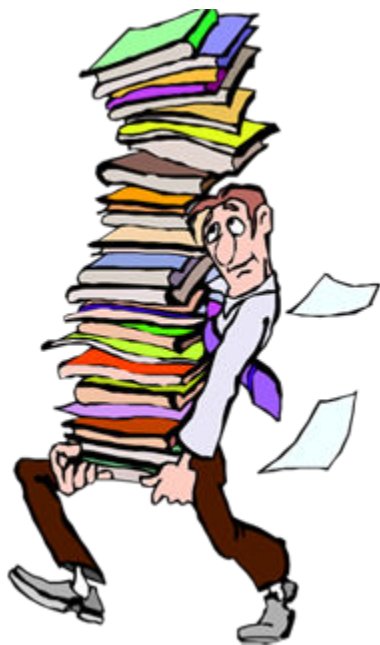
## Attribute Changes for <pub-id>

- An identifier (such as a DOI) can *also* be a link
- So, linking attributes (xlink:) added to <pub-id>
- The @pub-id-type (doi, archive, isbn) gets new values for citing data:
  - “accession”
  - “ark”
  - “handle”
- New attribute @assigning-authority

## Better Attributes for <isbn>

- ISBN attributes will look a lot more like ISSN attributes
- Attributes added:
  - @publication-type (medium or format such as print, electronic, audio, ebook, online-only, etc.).
  - @content-type
  - @specific-use
- @pub-type (old format and lifecycle precombined) will be retained for backwards compatibility, but not encouraged

## Documentation



## Redesigned Tag Library Documentation

- The Tag Libraries are *all new*
  - new behind the scenes processing
  - all HTML5 plus CSS
  - new look and feel
    - new colors
    - new CSS stylesheets
    - Javascript used, but pages degrade gracefully for non-script viewing
    - new navigation bar styling
    - tabs and other great navigation

## Tag Libraries have New Content Too!

- More and more and more samples (you asked for them)
- Each sample has an explanatory phrase or sentence
- Tagged samples for attributes
- New essays
  - Which of the *10 JATS DTDs* is right for you?
  - How to add BITS Question/Answer models to JATS

## Tag Libraries have Improved Language (we hope)

- Many Remarks rewritten  
(an internal @id is very different from an external DOI)
- Multiple typos fixed based on your feedback
- JATS history comments deleted (even we find the history confusing)
- No more “this attribute is” in default explanation  
(“@style is an optional attribute; there is no default.”)
- Index terms heavily edited
- Attribute values shown in *all lower case*  
(crossref, javascript, doi, issn, genbank)

## So Let's Take a Look (we' look at the Tag Libraries together)

## Your Turn

- Questions?
- Concerns?
- Observations?
- A story to share?
- Things you *wish* were in JATS  
(but have never asked for)



## Bye

- Class is almost over
- We will stay a little while, to answer more questions
- We have only 2 more things to say

## One: Debbie's Favorite Documentation Change

- The name of the element <supplementary-material>
- Has changed from “Supplementary Material”
- To “Supplementary Material *Metadata* ”
- Because the element <supplementary-material>:
  - may contain a description of supplementary material
  - may contain a pointer to supplementary material
  - **DOES NOT CONTAIN ANY SUPPLEMENTARY MATERIAL!**

(loud cheers in background)

## Two: You Asked for It!

- JATS changes because user needs change
- “User” means you!
- How do you change JATS? *Ask for it!*
- If you have a question, write to the JATS list  
<http://lists.mulberrytech.com/ unsub/jats-list/31879>
- If you need something new in JATS, tell us about it on the NISO comment form  
[http://www.niso.org/apps/group\\_public/add\\_comment.php?document\\_id=10591](http://www.niso.org/apps/group_public/add_comment.php?document_id=10591)
- If you need something modified in JATS, tell us about it on the NISO comment form  
[http://www.niso.org/apps/group\\_public/add\\_comment.php?document\\_id=10591](http://www.niso.org/apps/group_public/add_comment.php?document_id=10591)
- JATS only stays relevant if it moves and grows as you need it

## How To Get JATS to Change

- Use the formal mechanism (see previous slide)
- Be specific: what you want and why
- Provide examples:
  - Content to be tagged
  - Tagging you suggest
- Real examples are more persuasive than dummy examples
- Examples with permission to include in JATS documentation are a convenience to the Standing Committee
- *Put all XML tagging in an attachment*; this form eats pointy brackets and everything between pointy brackets!

## Colophon

- Slides and handouts created from single XML source
- Slides projected from HTML generated from XML using XSLT
- Print copy created from the same XML source
  - XSLT transform generates XHTML
  - Antenna House Formatter makes PDF from:
    - XHTML
    - CSS3 (slightly extended)

## Super Geeky Technical Details

There are a few very minor technical wrinkles in the story of perfect backwards compatibility. They are so tiny, and so easy to fix, and the story of 100% backwards compatibility is so close to true, that it can be told. In the interest of full disclosure, here is the fine print.

- 1.1d1 and 1.1d3 and <ruby>
- One ever-so-slight backwards incompatibility and the workaround for it

### Ruby Tagging

Ruby tags, to handle Ruby annotations on base text, have been requested by many Japanese JATS users. The JATS SC agreed that this would be very useful, for all of JATS, but did not want to invent a model for Ruby that would not be workable in browsers, formatting systems, etc. So the JATS SC decided to adopt the model from HTML5, and that was done for Committee Draft 1.1d1. Ruby was now part of JATS.

Between JATS Draft 1.1d1 and Draft 1.1d3, the W3C HTML5 Working Group changed their mind and their Ruby model. The original Ruby model allowed multiple annotations to cover a single base. The current model limits each Ruby to a single annotation. Since multiple annotations are by no means rare, this seems unfortunate, but JATS will follow. It is better to be usable than match some abstract model of correctness.

Therefore the current JATS Ruby model (patterned after the most recent HTML5) is not the same as the Draft 1.1d1 model. However, since NISO JATS 1.0 did not contain Ruby at all, the changes are still backwards compatible between 1.0 and 1.1d3. The JATS SC promised complete backwards compatibility with ANSI/NISO JATS 1.0, not with any particular Committee Draft.

### Concerning XHTML Customizations Only

This section describes the single non-backwardly compatible condition between JATS 1.0 and JATS 1.1d2 (hopefully 1.1).

This incompatibility can only happen to JATS users who:

- Use the XHTML table model;

### ***What's New in JATS since 1.0?***

- Have customized that model; and
- Have accomplished the customization by redefining the parameter entity named “Core.extra.attrib”.

If you have not done that, congratulations, your JATS 1.0 and 1.1d3 and completely backwards compatible.

If and only if your XHTML customization has added attributes to XHTML tables by redefining the parameter entity need “Core.extra.attrib”, you have a small task. You will need to uncomment the lines (lines 378-397) in the XHTML Table Setup Module “JATS-XHTMLtablesetup1.ent” that add the “Core.extra.attrib” parameter entity to the contents of the <caption> attribute list. Unless you make that change to the base JATS module, your new attributes will not be added to the list of <caption> attributes. Caution: When you uncomment this line, validating against your DTD may produce a “duplicative attribute warning” message on the @style attribute, which you may ignore.

