

Presentation by Michael Hucka at  
**COMBINE 2011**

[http://co.mbine.org/events/COMBINE\\_2011](http://co.mbine.org/events/COMBINE_2011)

Sunday, 4 September 2011

# General updates about SBML and SBML Team activities

Michael Hucka and the rest of the SBML Team

*Control and Dynamical Systems  
Division of Engineering and Applied Science  
California Institute of Technology  
Pasadena, CA, USA*



**SBML**

# Outline

- 1. SBML.org Updates**
- 2. SBML Development**
- 3. SBML Team Software**

# **SBML.org updates**

# SBML Software Guide changes

SBML Software Guide – SBML.org

http://sbml.org/SBML\_Software\_Guide Reader Google

**S**BML.org The Systems Biology Markup Language

News Documents Downloads Forums Facilities Community Events About Google Site Search...

Parent pages: SBML.org

## SBML Software Guide

The following pages describe SBML-compatible software packages known to us. We offer different ways of viewing the information, all drawn from the same underlying data collected from the systems' developers via our [software survey](#). The *Matrix* provides a table listing all known software and a variety of their features; the *Summary* provides general descriptions of most of the software; and the *Showcase* provides a sequential slideshow of a subset of the software.

Number of software packages listed in the matrix today: **230**.

[Go to the SBML Software Matrix](#)

[Go to the SBML Software Summary](#)

[Go to the SBML Software Showcase](#)

Please [use the survey form](#) to notify us about additions and suggestions.

[\[edit\] Historical trend](#)

The following graph shows the total number of known SBML-compatible software packages each year, as counted by the SBML Team. The counts shown are for approximately the middle of each year.

Year	Count
2000	~10
2001	~20
2002	~40
2003	~60
2004	~100
2005	~150
2006	~180
2007	~220
2008	~250
2009	~280

# New version of the SBML software survey

The screenshot shows a web browser window displaying the SBML Software Details Questionnaire. The title bar reads "SBML Software Guide/SBML Software Details Questionnaire – SBML.org". The address bar shows the URL "http://sbml.org/SBML\_Software\_Guide/SBML\_Software\_De...". The main content area features the SBML.org logo and the text "The Systems Biology Markup Language". A navigation menu at the top includes links for News, Documents, Downloads, Forums, Facilities, Community, Events, About, and a search bar for Google Site Search. Below the menu, a breadcrumb trail indicates "Parent pages: SBML.org / SBML Software Guide". The main section is titled "SBML Software Details Questionnaire" and "General information about your software". A progress bar shows "1 / 6". The text explains that users should fill out the form to update the SBML Software Guide and write papers about SBML software. Two input fields are provided for "your name" and "your email address". A third input field is for the "public contact address".

SBML Software Guide/SBML Software Details Questionnaire – SBML.org

http://sbml.org/SBML\_Software\_Guide/SBML\_Software\_De... Google

**SBML.org** The Systems Biology Markup Language

News Documents Downloads Forums Facilities Community Events About Google Site Search...

Parent pages: SBML.org / SBML Software Guide

## SBML Software Details Questionnaire

### General information about your software

1 / 6

Please fill out this form to tell us about your SBML-compatible software. We will use this information to update the **SBML Software Guide**. We may also use the information to write **papers about SBML software**.

*What is your name? (This is to verify the info you enter in this form; your name will not be put in the SBML Software Guide.)*

*What is your email address? (Again, this is to verify the information you enter; your name will not be put in the Guide.)*

*What is the public contact address for the software? Generally this is an email address (possibly the same as the one above, if you wish), although it can be an online help form instead.*

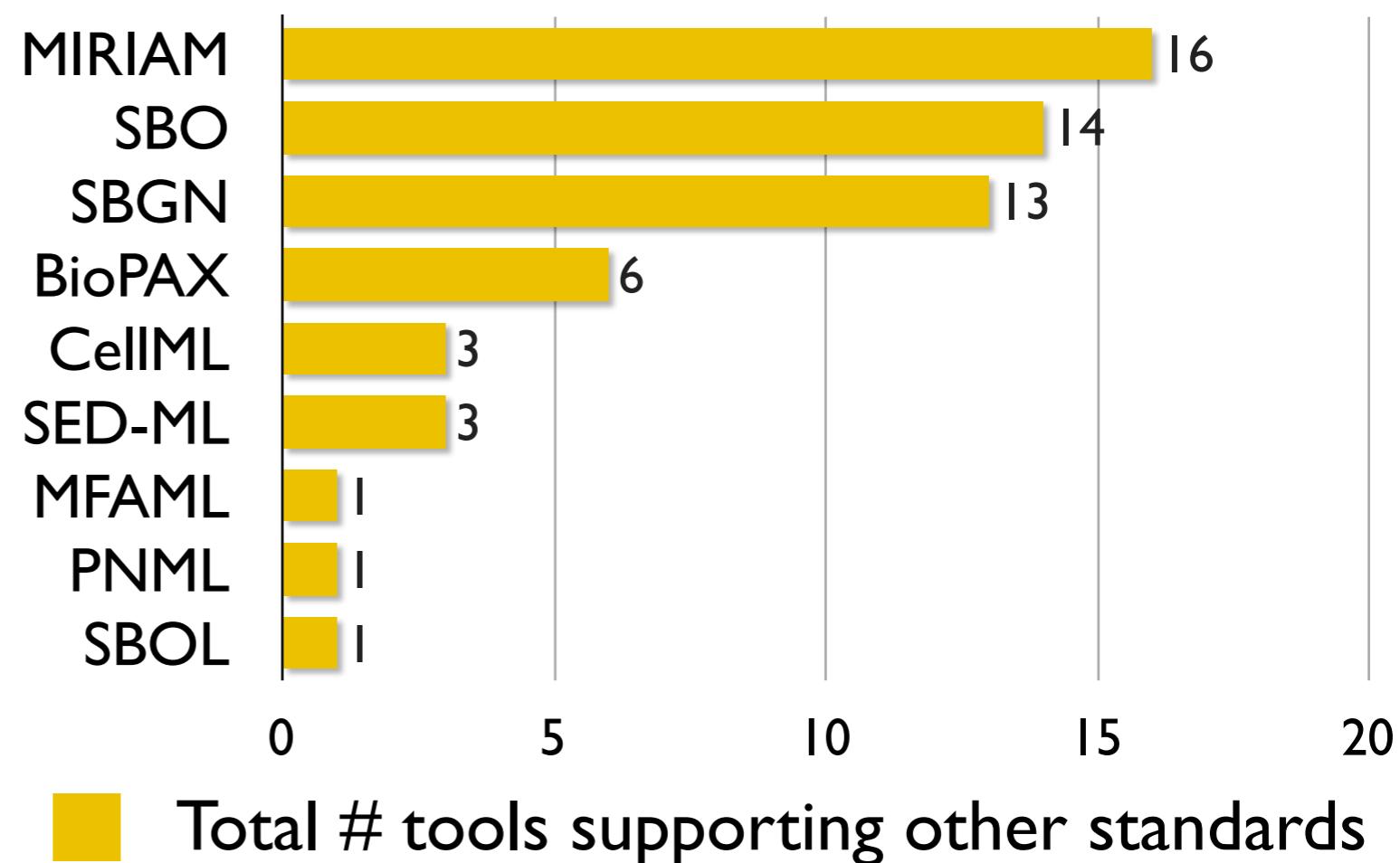
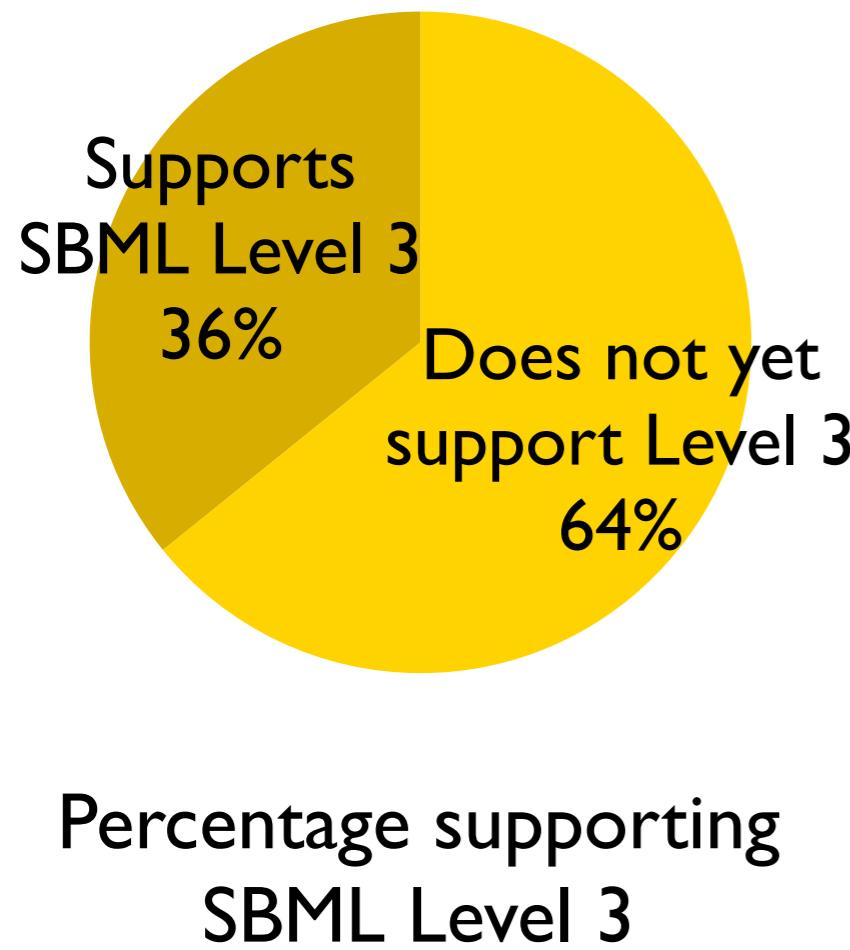
# Forthcoming in the SBML Software Guide

More data about SBML software in the world

More accurate data about SBML software in the world

Statistics about SBML software in the world

- Examples: data on 81 software tools reported between May–July



# Updated SBML Level 3 package activity table

Name	Label	Description	PWG list	Prop.	Spec.	
				Stat.	Stat.	libSBML
Level 3 Core	core	The core portion of SBML Level 3.	<a href="#">sbml-discuss</a>			
Layout	layout	Support for storing the spatial topology of a model's network diagram. Adjunct to the <i>render</i> package, below.	<a href="#">sbml-layout</a>			
Flux Balance Constraints	fbc	Support for constraint-based (a.k.a. steady-state) models.	<a href="#">sbml-flux</a>			
Rendering	render	Support for defining the graphical symbols and glyphs used in a diagram of the model. Adjunct to the <i>layout</i> package above.	<a href="#">sbml-render</a>			
Hierarchical Model Composition	comp	A means for defining how a model is composed from other models.	<a href="#">sbml-comp</a>			
Qualitative Models	qual	Support for models wherein species don't represent quantity of matter & processes are not reactions per se. (E.g.: Boolean nets.)	<a href="#">sbml-qual</a>			
Annotations	annot	Support for richer annotation syntax than the regular annotations in SBML Level 3 Core.	<a href="#">sbml-annot</a>			
Spatial Processes	spatial	Support for describing processes that involve a spatial component, and describing the geometries involved.	<a href="#">sbml-spatial</a>			
Groups	groups	Support for groups of SBML entities. This partially replaces the Level 2 SpeciesType and CompartmentType constructs with a new GroupType construct.	<a href="#">sbml-groups</a>			
Required Elements	req	elements that have been changed by the <a href="#">SBML 3.1.1 specification</a>	<a href="#">sbml-required</a>			

<http://sbml.org/Community/Wiki>

# **SBML Development**

# SBML Development Process Progress

Documents/SBML Development Process – SBML.org

http://sbml.org/Documents/SBML\_Development\_Process

Process/SBML Development Proc... Development Process – SBML.org

**SBML.org** The Systems Biology Markup Language

News Documents Downloads Forums Facilities Community Events About Google Site Search...

Parent pages: SBML.org / Documents

## SBML Development Process

An intrinsic aspect of SBML's development has been the adoption of a participative, community-oriented approach. In the early years of SBML, this process was highly informal. The use of SBML has grown to the point where its original, informal approach to development is no longer sufficient to meet the needs of the SBML community and the continued evolution of SBML. Beginning in 2003, the SBML Team and SBML Editors have been working to put into place a more formal organization and systematic process, one that will be less ambiguous and subjective and more responsive to the needs of the SBML community. This page describes the plans for this *SBML Development Process*, and the current status of its implementation.

This SBML Development Process is being followed as of mid-2008.

The process described here evolved from previous proposals and discussions, and supercedes all previous SBML Development Process descriptions and proposals. (Previous proposals were presented at the following SBML Forum meetings: the **7th**, the **10th**, the **11th**, and the **12th**.) Some readers may recall that previous proposals involved additional components not described here (such as the formation of an "Architectural Board"; these ideas were dropped because they did not fit well with the overall goals of the process). The goal of this document is to simplify the SBML Development Process as much as possible.

**Contents [hide]**

- 1 Goals and Motivations for SBML
- 2 Goals of the SBML Development Process
- 3 SBML Community Organization
  - 3.1 The SBML Forum
    - 3.1.1 Requirements for membership
    - 3.1.2 Conduct of meetings
  - 3.2 The SBML Editors
    - 3.2.1 Responsibilities of SBML Editors
    - 3.2.2 Terms for SBML Editors
    - 3.2.3 Election process for SBML Editors
    - 3.2.4 Selection of the Chair of the SBML Editors
  - 3.3 The SBML Team
- 4 SBML Development Procedures and Guidelines
  - 4.1 Development Roadmap
  - 4.2 General Procedures and Guidelines
    - 4.2.1 Public participation
    - 4.2.2 Communication and transparency
    - 4.2.3 Achieving consensus
    - 4.3 Simplifying the SBML Development Process
      - 4.3.1 SBML Levels, Versions, and Releases
      - 4.3.2 Process for SBML Level 2

[http://sbml.org/Documents/SBML\\_Development\\_Process](http://sbml.org/Documents/SBML_Development_Process)

# Elaboration of process for Level 3 packages

Documents/SBML Development Process/SBML Development Process for SBML Level 3 - SBML.org

Process/SBML Development Proc... Development Process – SBML.org

**S**BML.org The Systems Biology Markup Language

News Documents Downloads Forums Facilities Community Events About Google Site Search...

Parent pages: SBML.org / Documents / SBML Development Process

## SBML Development Process for SBML Level 3

The overall SBML Development Process is detailed on a [separate page](#). The present page describes specific aspects of the process that concern the development of SBML Level 3.

SBML Level 3 is modular, in the sense of having a defined core set of features and optional *packages* adding features on top of the core. This modular approach means that models can declare which feature-sets they use, and likewise, software tools can declare which packages they support. It also means that the development of SBML Level 3 can proceed in a modular fashion. The development process for Level 3 is designed around this concept.

Packages take significant time and effort to develop. It would be unreasonable to require the production of a complete specification for a package before the SBML Forum is asked to vote on whether the package is even considered worthwhile and appropriate for SBML Level 3. Therefore, the development of packages is divided into two main stages:

- The [proposal development stage](#)
- The [specification development stage](#)

This separation means that *proposals* for packages may be produced at relatively low cost in terms of effort, time and other resources. As explained below, the *specification* stage requires more effort, including software implementations. Only after the purpose and general outline of a proposed package are accepted does the full specification need to be produced.

### [edit] The package proposal development stage

At this time (December 2008), a specification for the core for SBML Level 3 is in development, and no official packages exist yet. The following process is thus only partially specified. The process is summarized in the following flowchart and explained

**Contents [hide]**

- 1 The package proposal development stage
- 2 The package specification development stage

### [edit] Contents of the voting form

The voting form for package proposals will reflect the principles described in the section on **architectural principles**. To encourage thoughtful and thorough consideration of the proposed packages with respect to those **architectural principles**, the form will request voters to address the points individually, and ask for an overall assessment as a separate question. The following is an outline of the basic content of the voting form:

**Utility:** the package addresses a problem whose solution SBML users are likely to find useful.

<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Insufficient information	<input type="checkbox"/> Abstain
--------------------------------	-----------------------------------	---------------------------------------------------	----------------------------------

**Biological orientation:** the package's overall aim is to support the description of biological processes and phenomena.

<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Insufficient information	<input type="checkbox"/> Abstain
--------------------------------	-----------------------------------	---------------------------------------------------	----------------------------------

**Coherence:** the package extends SBML in a way that follows naturally from Level 3 Core and other packages.

<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Insufficient information	<input type="checkbox"/> Abstain
--------------------------------	-----------------------------------	---------------------------------------------------	----------------------------------

**Orthogonality:** within reason, the package does not duplicate the purpose or data captured by other packages.

<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Insufficient information	<input type="checkbox"/> Abstain
--------------------------------	-----------------------------------	---------------------------------------------------	----------------------------------

#### **Overall assessment of the package proposal:**

- Accept:** proposal addresses a need that SBML should cover, and the approach clearly follows the stated principles
- Reject:** proposal does not address a need that SBML should cover
- Revise:** approach either does not follow the stated principles, or there is insufficient information to tell if it does
- Abstain:** I cannot fully assess the proposal as given, or do not wish to state an opinion

In addition to the above, the voting form will include comment boxes that allow voters to provide more detailed feedback about the proposal and why they voted the way they did.

### [edit] Formula for assessing the outcome

To assess the outcome of the vote, the SBML Editors will use only the question titled "*Overall assessment of the package proposal*" in the form **described above**. The formula to be used is as follows:

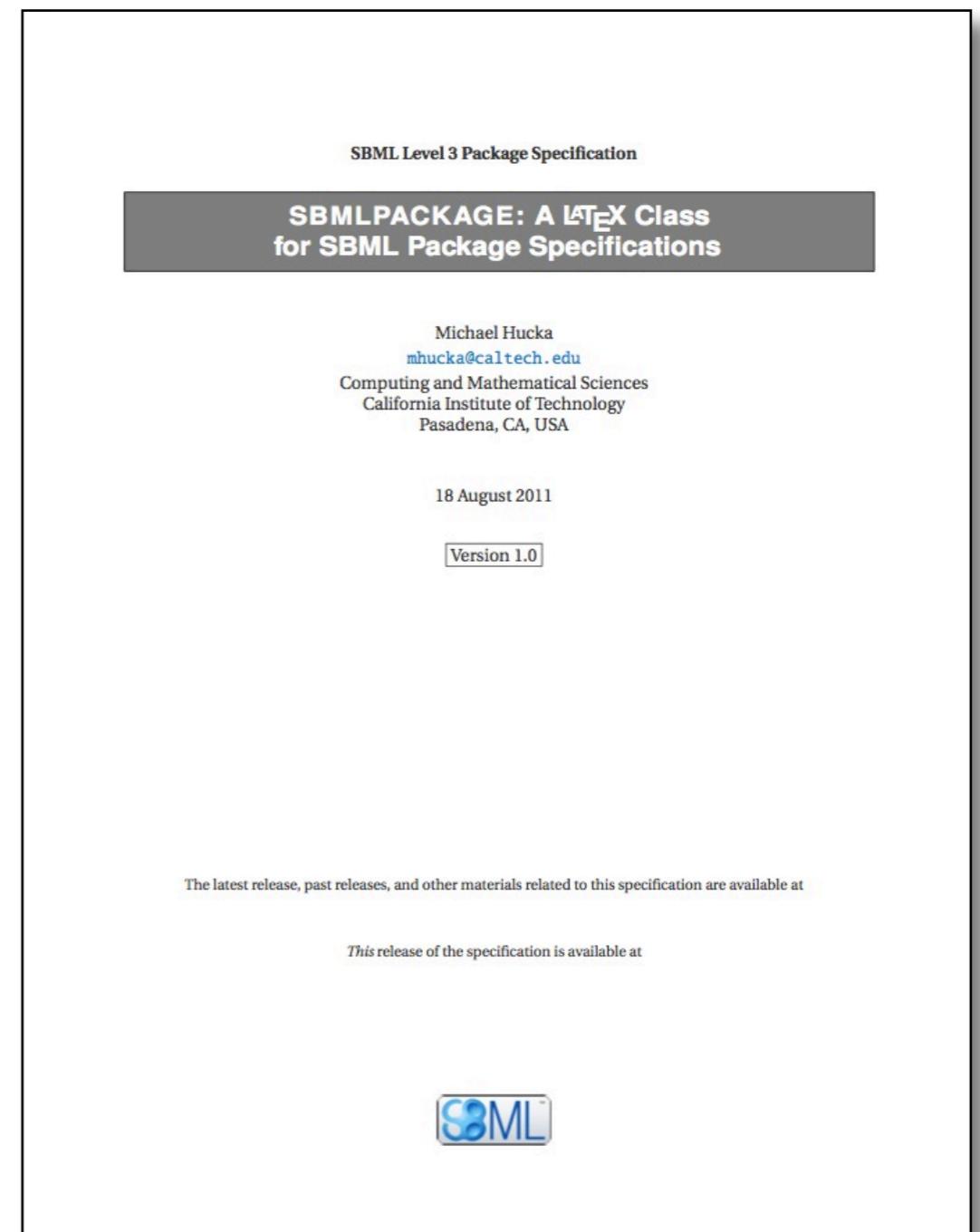
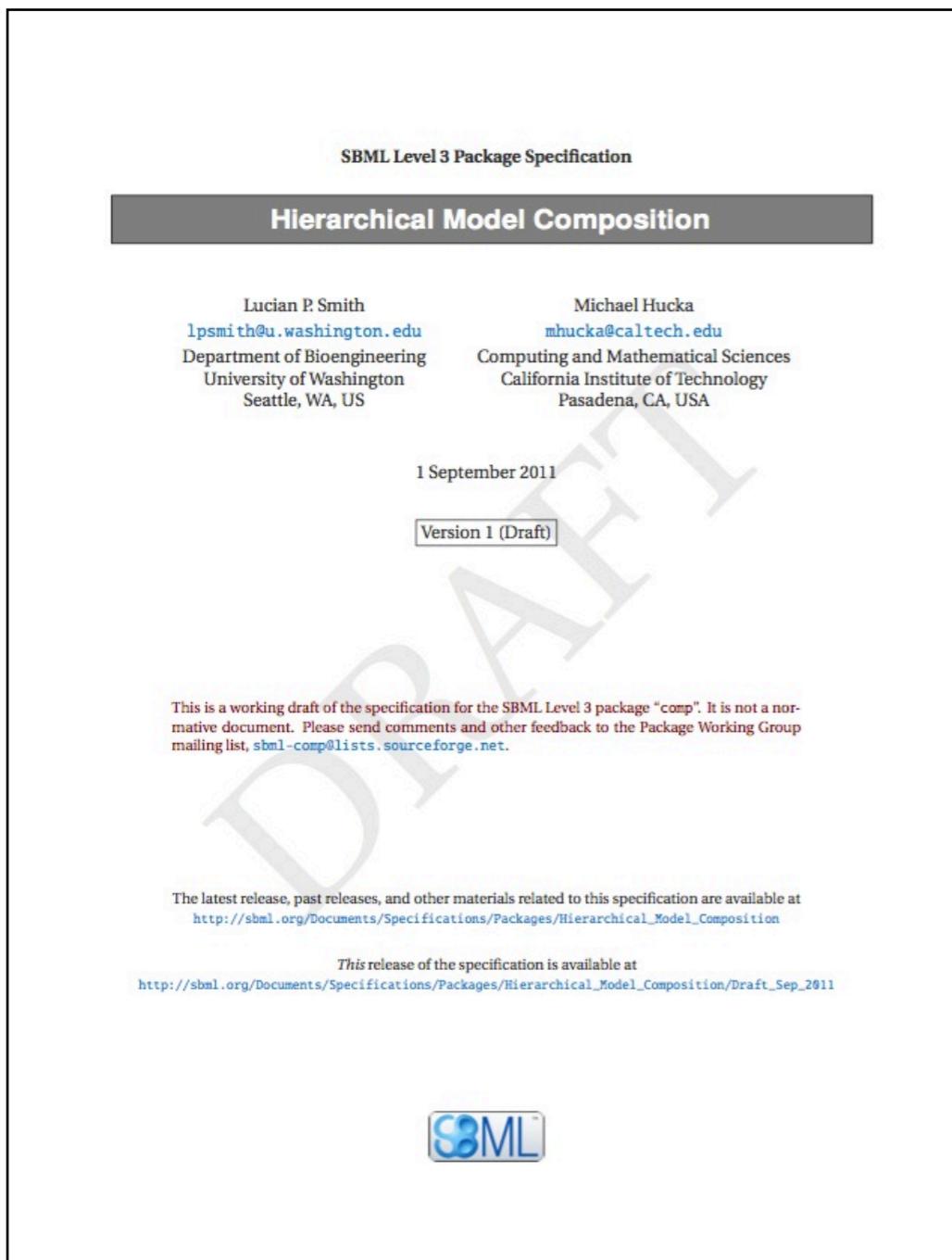
1. For the decision to be *accept*, 50% or more of the non-abstaining voters must have chosen the *accept* option.
2. For the decision to be *reject*, more than 50% of the non-abstaining voters must have chosen the *reject* option.

# Further elaboration of package voting criteria

# Writing L3 package specs

Proper draft spec. for Hierarchical Model Composition almost ready

New LaTeX templates for SBML package specifications



# SBML Editor vote coming up



Chris



Jim



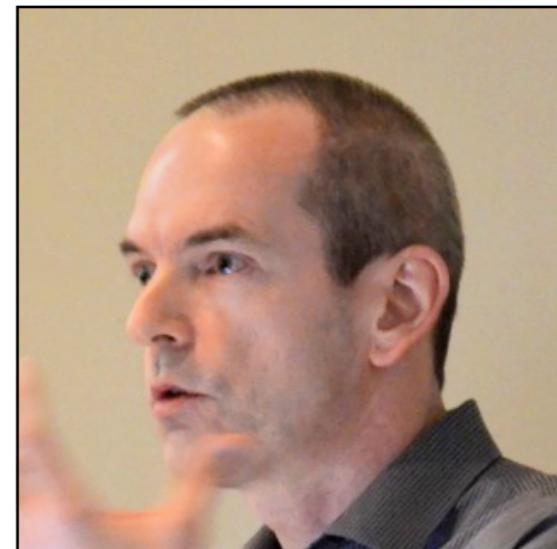
Lucian



Sarah



Frank



Yours truly

One new editor being replaced

- Nominations & voting open to anyone on sbml-discuss mailing list

# SBML Editor vote coming up



Chris



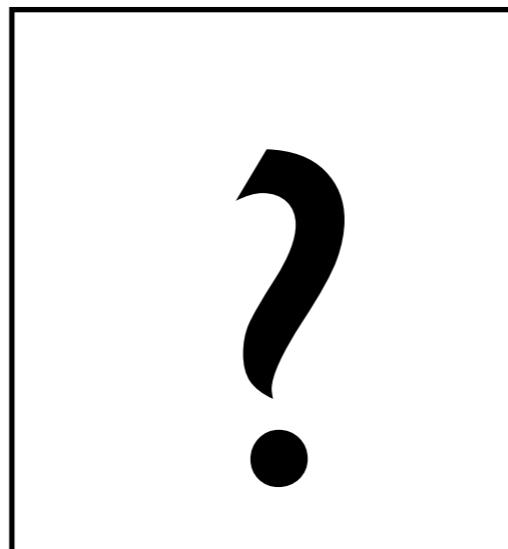
Jim



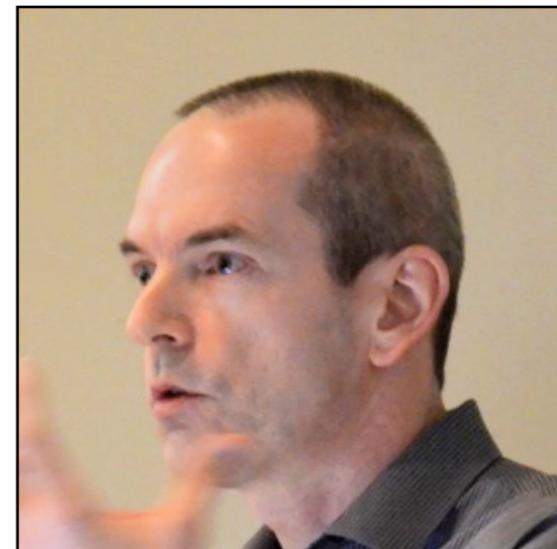
Lucian



Sarah



Frank



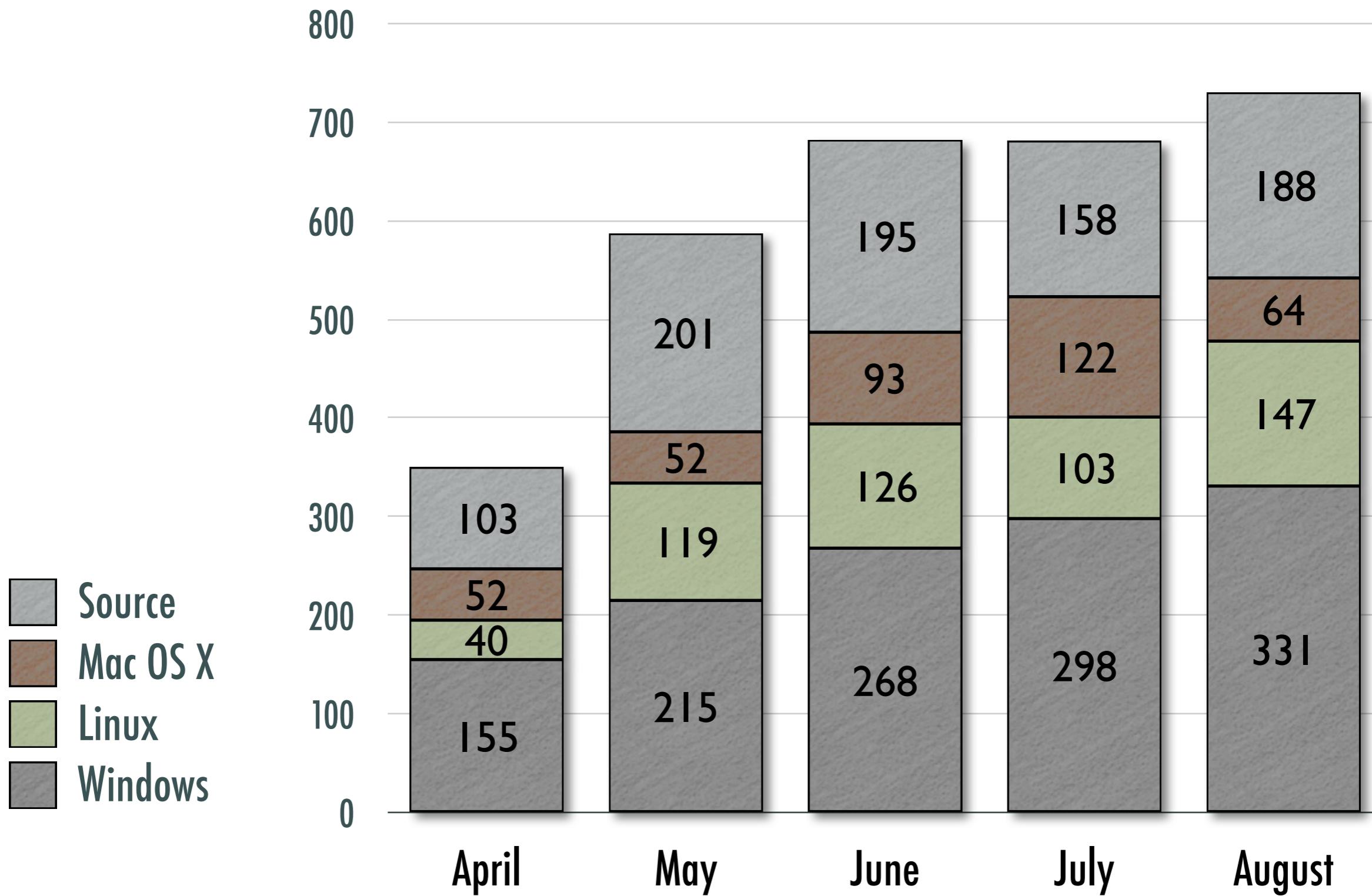
Yours truly

One new editor being replaced

- Nominations & voting open to anyone on sbml-discuss mailing list

# **SBML Team Software**

# libSBML 5.0.0: over 3400 downloads since April



Downloads of all libSBML 5.0.0 distributions since April

# Other software news

LibSBML, JSBML, SBMLToolbox, Online SBML Validator, others....

... Listen to Sarah, Frank, Nico & Andreas