



The SBML Java<sup>TM</sup> library

# Concept of JSBML

- Compromise:
  - High compatibility to libSBML
  - Java-like library
- Main developers
  - Nicolas Rodriguez and Andreas Dräger
  - Both available during the meeting any time to answer JSBML-related questions



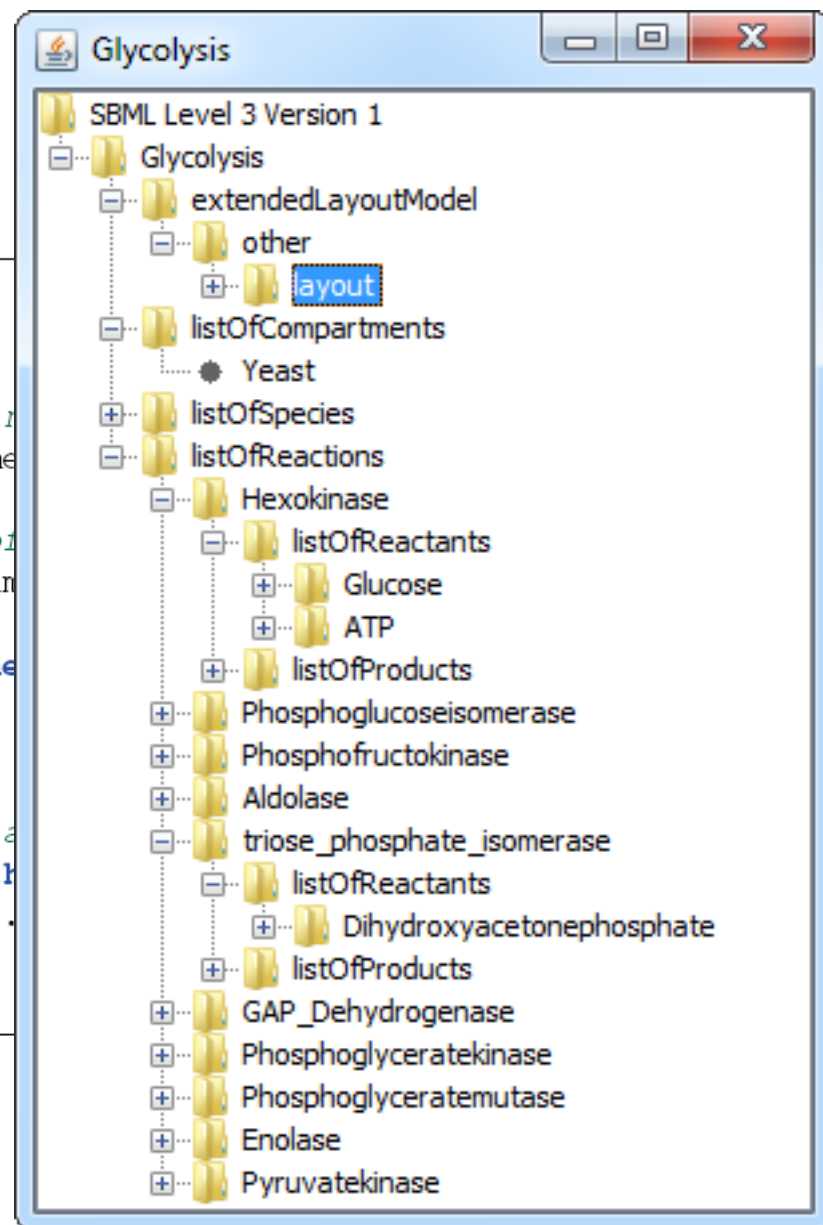
How to get started?

# Obtaining JSBML

- <https://sourceforge.net/projects/jsbml/>
- Download the file `jsbml - 0.8-b2-with-dependencies.jar`.
- Once you have added it to the Java CLASSPATH, you can start working with JSBML.

# Visualizing the content of an SBML

```
1 import javax.swing.*;
2 import org.sbml.jsbml.*;
3
4 /** Displays the content of an SBML file in a JFrame
5 public class JSBMLvisualizer extends JFrame
6
7     /** @param document The sbml root node of
8     public JSBMLvisualizer(SBMLDocument document) {
9         super(document.getModel().getId());
10         getContentPane().add(new JScrollPane(new JPanel()));
11         pack();
12         setVisible(true);
13     }
14     /** @param args Expects a valid path to a
15     public static void main(String[] args) throws IOException {
16         new JSBMLvisualizer(new SBMLReader().read(args[0]));
17     }
18 }
```



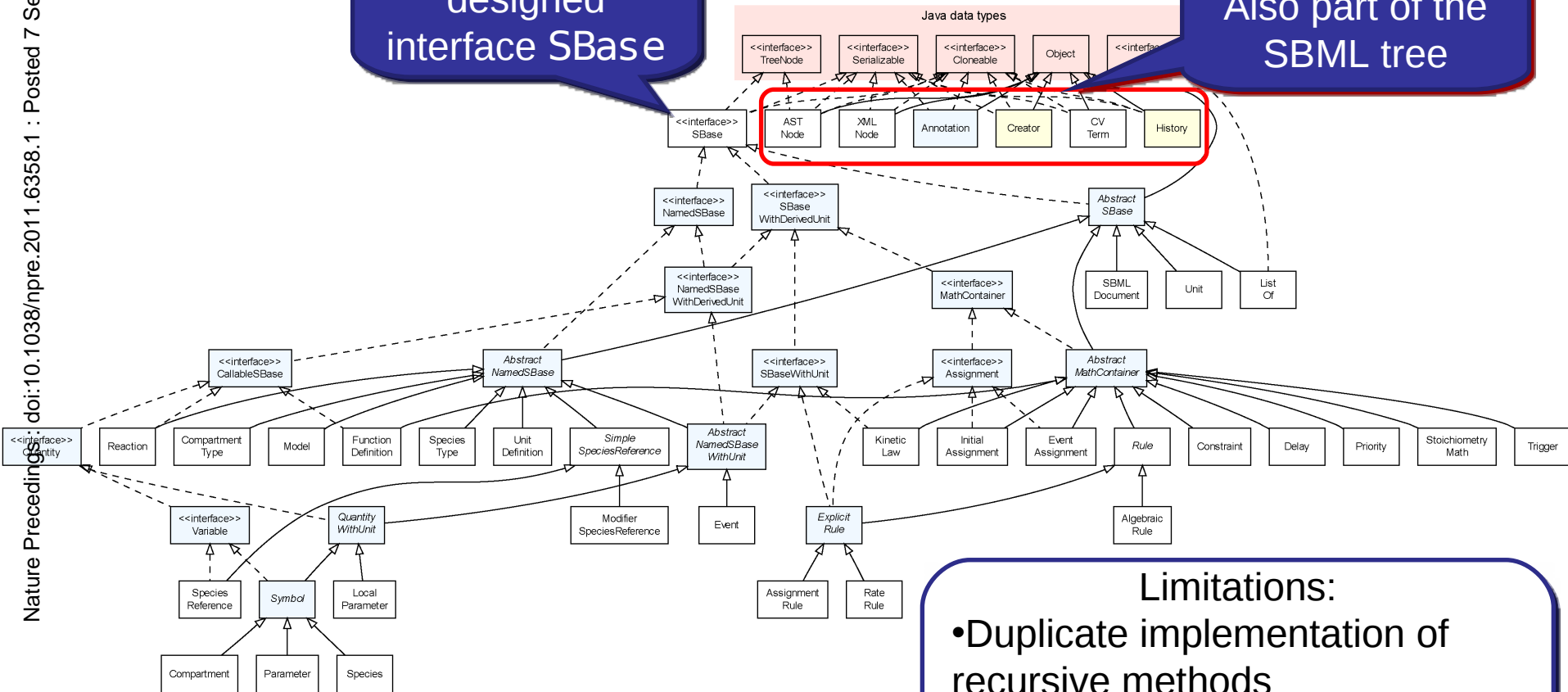


Data types

# Type hierarchy

Recursively  
designed  
interface SBase

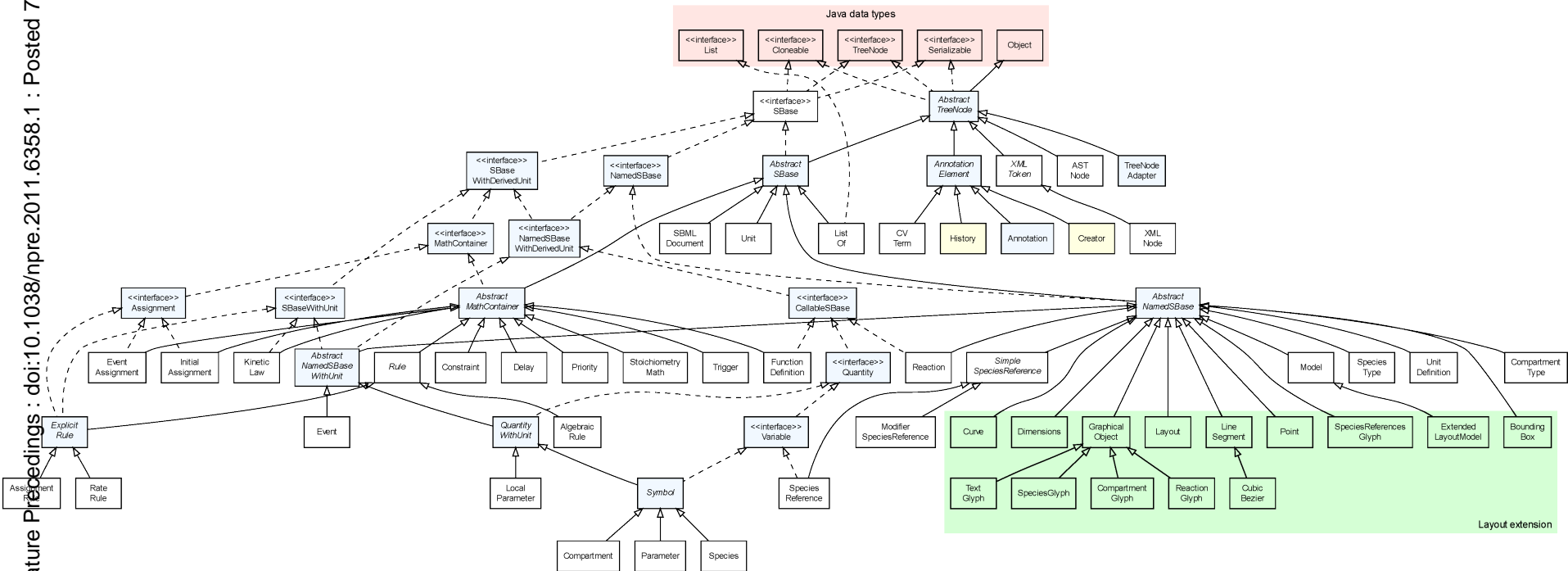
Also part of the  
SBML tree



## Limitations:

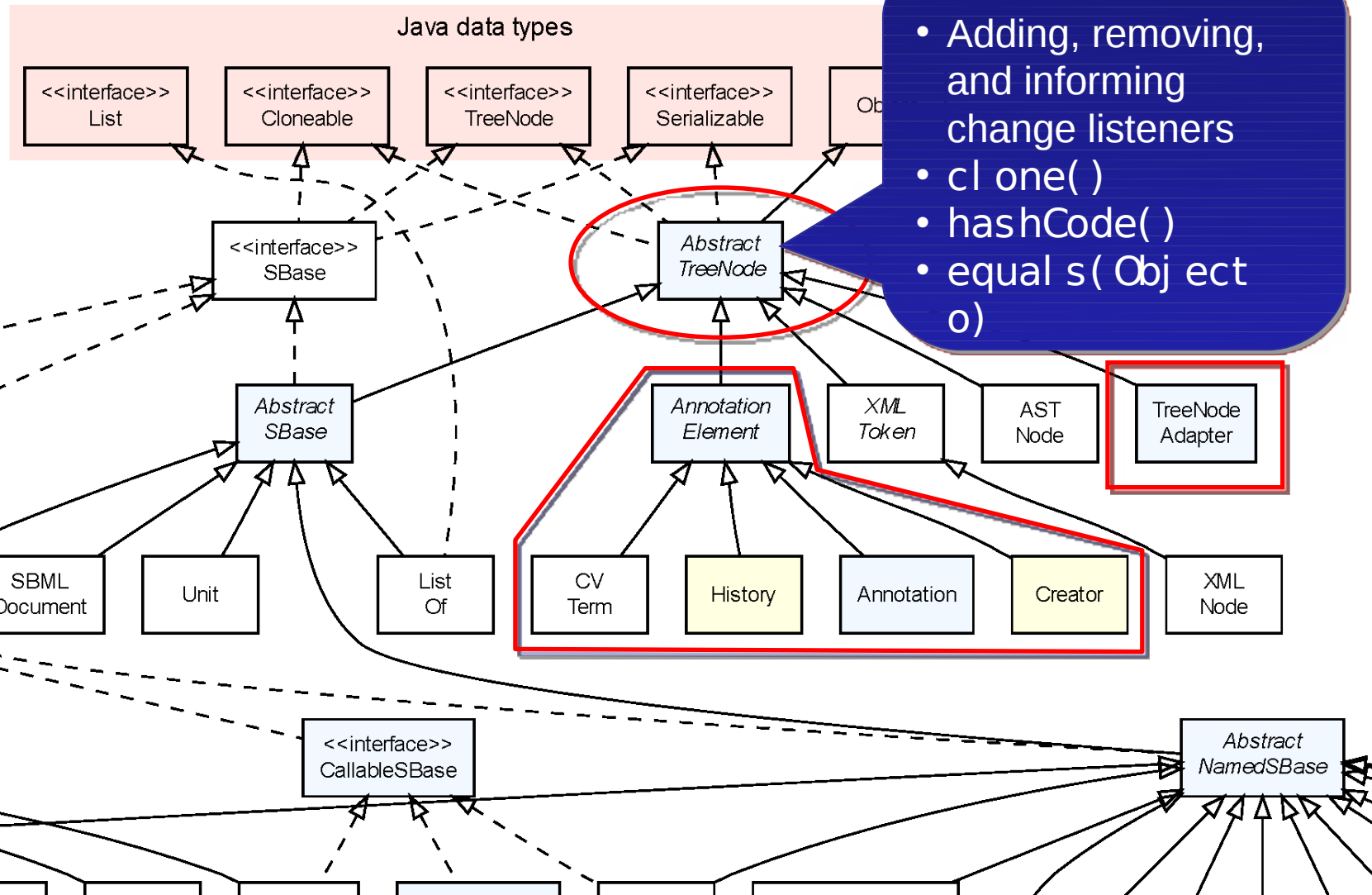
- Duplicate implementation of recursive methods
- No way to listen to changes in elements not derived from SBase

# Unified type hierarchy





# New top level super class AbstractTreeNode



# Listening to changes

SBaseChangeListener in package org.sbm.j.sbm

```
public void sbaseAdded( SBase sb) {  
    System.out.println( "[ ADD] " + sb);  
}
```

```
public void sbaseRemoved( SBase sb) {  
    System.out.println( "[ RMV] " + sb);  
}
```

```
public void stateChanged( SBaseChangeEvent  
ev) {  
    System.out.println( "[ CHG] " + ev);  
}
```

# Improved listener: TreeNodeChangeListener

Package org.sbm.jsbm.util, extending  
java.beans.PropertyChangeListener

```
public void nodeAdded(TreeNode node) {  
    System.out.println("[ ADD ] " + node);  
}
```

```
public void nodeRemoved(TreeNode node) {  
    System.out.println("[ RMV ] " + node);  
}
```

```
public void  
propertyChange(PropertyChangeEvent evt) {  
    System.out.println("[ CHG ] " + evt);  
}
```

Specialised event  
implementation:  
TreeNodeChangeEvent



New features and bug fixes

# New features – an overview

- `TreeNodeAdapter` as a wrapper for child elements that cannot extend `AbstractTreeNode`
- `SBMLreader`: static methods
- Maven script by Igor Rodchenkov
- `initDefaults(int level, int version)`
- Check for duplicate metals
- Automatic, recursive level/version update in case of adding elements with undefined L/V specification to a top element

# Most important bug fixes

- General improvements:
  - Closing streams after reading/writing SBML files
  - Support for NaN values in formulas and ASTNodes
- Improved Level 1 support:
  - Parsing of Rules with a type attribute (e.g., rate)
  - Denominator attribute in SpeciesReference was never read
  - No MathML in KineticLaw
  - Exception during conversion between LocalParameter and Parameter (no constant attribute)
- Improved Level 3 support:
  - getDerivedUnitsInstance() in Species



# Download of modules

- LibSBML input/output:

```
svn co
```

```
"https://jsbml.svn.sourceforge.net/svnroot/jsbml/modules/libSBMLio/"
```

```
libSBMLio
```

- CellDesigner bridge:

```
svn co
```

```
"https://jsbml.svn.sourceforge.net/svnroot/jsbml/modules/cellDesigner"
```

```
cellDesigner
```

- LibSBML compatibility module for switching between libSBML and JSBML still under development



# How to contribute

## Creating a patch:

- Checkout the sources from sourceforge  
`svn co "https://jsbml.svn.sourceforge.net/svnroot/jsbml/trunk/jsbml" JSBML`
- Do your modifications, then create a patch file:  
`svn diff > jsbml-patch.txt`
- Attach it to a tracker item or send it through the development list.

## Bug tracker:

[http://sourceforge.net/tracker/?group\\_id=279608&at\\_id=1186776](http://sourceforge.net/tracker/?group_id=279608&at_id=1186776)

## Mailing lists:

- [jsbml-devel@caltech.edu](mailto:jsbml-devel@caltech.edu): public list with discussion about the development of JSBML and support for users.
- [jsbml-team@caltech.edu](mailto:jsbml-team@caltech.edu): private list for the JSBML team where anybody can send mails for support or bugs reports.

## **JSBML: a flexible Java library for working with SBML**

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# Thanks for your attention!

<http://sbml.org/Software/JSBML>