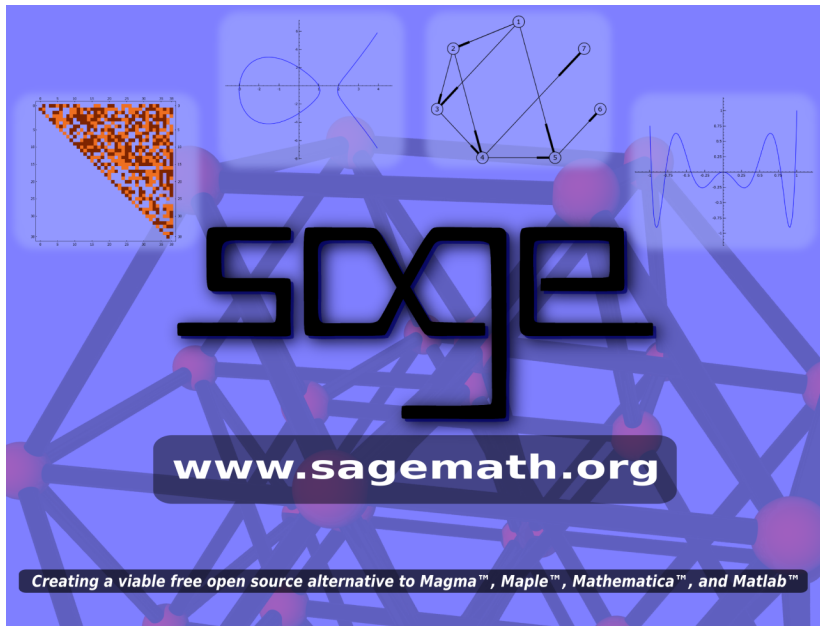


# William Stein: Sage Days 7 - Quick Status Report and Discussion

The background features a blue gradient with a network of grey nodes and lines. Several mathematical plots are overlaid: a heatmap in the top left, a cardioid curve in the top center, a directed graph with nodes 1-7 in the top right, and a sine wave in the middle right. The Sage logo is prominently displayed in the center, and the website URL is in a dark blue box below it. A footer banner is at the bottom.

**sage**

[www.sagemath.org](http://www.sagemath.org)

*Creating a viable free open source alternative to Magma™, Maple™, Mathematica™, and Matlab™*

- 1 History
- 2 Media Attention
- 3 Python – the right choice?
- 4 Bloat?
- 5 General Goals for 2008

## In case you don't know, this is the history of Sage

1997–1999 (**Berkeley**) **HECKE** – C++ (modular forms)

1999–2005 (**Berkeley, Harvard**) I wrote over 25,000 lines of **Magma** code.

The languages, devel models, and approach of Magma, Mathematica, and Maple are **old-fashioned and painful**.

I need to be able to **see inside and change anything** in my software in order to be the best in the world at my research.

**For me, Magma is a bad long-term investment.**

Feb 2005 I released **SAGE-0.1** (3 years ago!)

Feb 2006 **UCSD SAGE Days 1** workshop – SAGE 1.0.

October 2006 **U Washington SAGE Days 2** workshop.

March 2007 **UCLA SAGE Days 3** workshop.

May 2007 Sage NSF grant– funds Clemenet Pernet.

June 2007 **U Washington SAGE Days 4** workshop.

October 2007 **Clay Math Institute SAGE Days 5** workshop.

November 2007 **Heilbronn Institute SAGE Days 6**

Now **SAGE-2.10.1**; Sage Days 7, which is the **10th Sage workshop!**

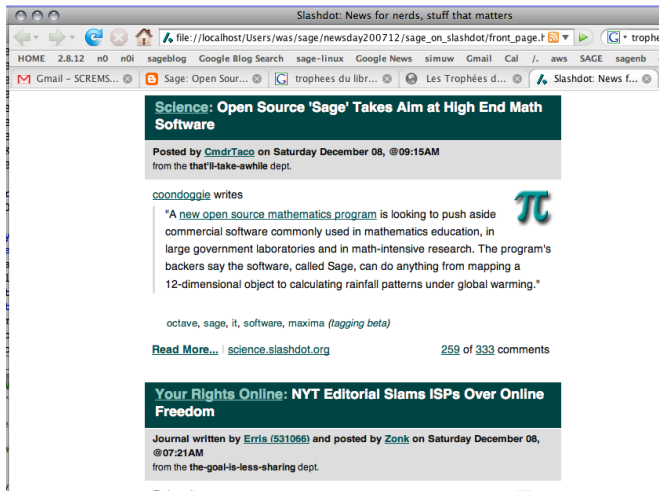
### Sage: Mission Statement

Provide a uniform open source high-quality **viable alternative** to **Magma, Mathematica, Maple** and **MATLAB**.

Do not reinvent the wheel but **reuse** as many **existing building blocks** as possible and make sure the result is **rigorously tested, easy to modify** by the end user and **very well documented**.

Also create a **helpful environment** and community (mailing lists, irc-channel, workshops, coding sprints).

# Nov 2007: Sage wins first place in Tropheés du Libre and gets slashdotted...



The screenshot shows a web browser window with the title "Slashdot: News for nerds, stuff that matters". The address bar shows a local file path. The browser's menu bar includes "HOME", "2.8.12", "n0", "n0i", "sageblog", "Google Blog Search", "sage-linux", "Google News", "simuw", "Gmail", "Cal", "/", "aws", "SAGE", "sagenb". The tab bar shows several open tabs, including "Gmail - SCREMS...", "Sage: Open Sour...", "trophees du libr...", "Les Tropheés d...", and "Slashdot: News f...".

The main content area features a news item with a dark green header: **Science: Open Source 'Sage' Takes Aim at High End Math Software**. Below the header, it says "Posted by [CmdrTaco](#) on Saturday December 08, @09:15AM from the [that'll-take-awhile](#) dept."

The article text begins with "coondoggie writes" and includes a quote: "A [new open source mathematics program](#) is looking to push aside commercial software commonly used in mathematics education, in large government laboratories and in math-intensive research. The program's backers say the software, called Sage, can do anything from mapping a 12-dimensional object to calculating rainfall patterns under global warming." To the right of the quote is a large blue pi symbol ( $\pi$ ).

Below the quote, it says "octave, sage, it, software, maxima (*tagging beta*)". At the bottom of the article snippet, it says "Read More... | [science.slashdot.org](#) 259 of 333 comments".

Below this article is another news item with a dark green header: **Your Rights Online: NYT Editorial Slams ISPs Over Online Freedom**. It says "Journal written by [Erris \(531066\)](#) and posted by [Zonk](#) on Saturday December 08, @07:21AM from the [the-goal-is-less-sharing](#) dept."

Tons of articles all over resulted, about 10,000 downloads in a weekend, etc...

# What is Sage?

Sage is a very large mathematics software package developed by a worldwide community of developers. Sage is:

- 1 a **distribution** of the best free, open-source mathematics software available (Sage 2.9.3 ships well over 50 packages) that is easy to compile or install from binaries.
- 2 a **huge new library**, covering the widest area of **functionality**.
- 3 **interfaces** to almost all existing mathematics software packages (including Magma, PARI, Gap, Mathematica, Maple, etc.) **NOT OpenMath or MathML!**



## Python

- A mainstream language with millions of users.
- **TIOBE declares Python as programming language of 2007!** “Python has been declared as programming language of 2007. It was a close finish, but in the end Python appeared to have the largest increase in ratings in one year time (2.04%). There is no clear reason why Python made this huge jump in 2007. Last month *Python surpassed Perl* for the first time in history, which is an indication that Python has become the “de facto” glue language at system level. It is especially beloved by system administrators and build managers. Chances are high that Python’s star will rise further in 2008, thanks to the upcoming release of Python 3.”

## Cython: compiled Python

- Growing and getting used in other projects... e.g., hedge funds!
- Cython is for some people definitely one of the main “killer features” of Sage over Magma.

## Sage is Massive: Bloated?



- Sage is huge – about 5 million lines of code! (That's roughly exactly the same size as the Linux 2.6 kernel, and over twice the size of Magma.)
- Sage really covers all the main areas of mathematics computation now.
- It would be very good to have a clear procedure for standard packages getting into (and out of?) Sage. **Discuss.**



# Some Specific Goals for 2008

## Main Theme: Growth, polish, and consolidate our position.

### ■ Growth:

- 500 (non-spammers) subscribed to sage-devel (we have 338 now).
- 1000 (non-spammers) subscribed to sage-support (we have 307 now).

### ■ Code coverage:

- Push doctest coverage of Sage library up to 100% (it is currently at 38.8% of 18,290 functions).
- Identify and rewrite/fix all crappy code in Sage library.

### ■ Money:

- Stable funding for at least 3 Sage Days per year for the next 5 years
- Funding for two full time employees for the next 3 years. (We have 1, and Mabshoff for this year.)