

# Web 2.0 Community Building Strategies: The World of Science 2.0

John Dupuis  
Steacie Science & Engineering Library  
York University

Ontario Library Association Superconference  
January 29, 2009



ARE YOU COMING TO BED?

I CAN'T. THIS  
IS IMPORTANT.

WHAT?

SOMEONE IS WRONG  
ON THE INTERNET.



It's about  
building, facilitating and  
engaging in

# Communities

For our patrons and  
ourselves.

It's about learning from  
others which strategies have  
worked

And which haven't.

Nothing is sadder than an  
empty social network.



Some thoughts

The internet offers us the first major opportunity to improve [the] collective long-term memory [of science], and to create a collective short-term working memory, a conversational commons for the rapid collaborative development of ideas.

-[Michael Nielsen](#)

The process of scientific discovery - how we do science - will change more over the next 20 years than in the past 300 years.

-Michael Nielsen

This change will not be achieved without great effort. From the outside, scientists currently appear puzzlingly slow to adopt many online tools.

-Michael Nielsen

What is missing to make the vision a reality:  
integration between data and publication,  
integration of authoring and publication,  
traditional publications being associated with  
podcasts and video, professional networking  
akin to social networking?

-[Cameron Neylon](#)  
(on FriendFeed)

**What kind of website do you wish there was that would help you with your work?**  
What sorts of tools and features would it have? What parts of your work/job would be greatly helped by a well designed website?

-[Corie Lok](#)  
(on Nature Network)

Writing papers in a fast and easy way is what scientists want, and if that happens to come with tagging and showing their collection of papers to the whole world, they'll do that too. Once that happens, **the concept of sharing will become more mainstream, and opening lab notebooks and data sharing can follow.**

-[Eva Amsen](#)  
(on Nature Network)

Any contradictions and challenges apparent from the preceding quotes?



# Definitions -- what it's all about

- Web 2.0
- Community
- Science 2.0

# Some other helpful definitions

- eScience
- Open Access (green/gold/libre/gratis)
- Open Science
- Open Source
- Computational Science
- Cyberinfrastructure
- Open Peer Review
- Data Curation
- Cloud Computing
- Any others?

# FIELDS ARRANGED BY PURITY

→  
MORE PURE

SOCIOLOGY IS  
JUST APPLIED  
PSYCHOLOGY

PSYCHOLOGY IS  
JUST APPLIED  
BIOLOGY.

BIOLOGY IS  
JUST APPLIED  
CHEMISTRY

WHICH IS JUST  
APPLIED PHYSICS.  
IT'S NICE TO  
BE ON TOP.

OH, HEY, I DIDN'T  
SEE YOU GUYS ALL  
THE WAY OVER THERE.



SOCIOLOGISTS

PSYCHOLOGISTS

BIOLOGISTS

CHEMISTS

PHYSICISTS

MATHEMATICIANS

<http://xkcd.com/435/>

# A very selective tour of Science 2.0

- Blogging
  - [ScienceBlogs](#)
  - [Scientific Blogging](#)
  - [Nature Network](#)
  - [Stanford Blog Directory](#)
  - [Discover Blogs](#)
- Social Bookmarking & Citation Management
  - [Connotea](#)
  - [2collab](#)
  - [Delicious](#)
  - [CiteULike](#)
  - [Mendeley](#)
  - [Zotero](#)

- Social Networks
  - [Nature Network](#)
  - [FriendFeed](#)
  - [FaceBook](#)
- Repositories
  - [arxiv](#)
  - [Nature Precedings](#)
- [Open Notebook Science](#)
  - [Useful Chemistry](#)
  - [Cameron Neylon](#)
- [Open Access](#)
  - [PLoS](#)
  - [BioMedCentral](#)

- Outreach
  - [Inside Duke Medicine](#)
  - [MST Visions](#)
  - [Planet York](#)
- Video
  - [SciVee](#)
  - [Journal of Visualized Experiments](#)
- Open Peer Review
  - [PLoS ONE](#)
  - [Nature experiment](#)
- Conferences
  - [SciFoo](#)
  - [ScienceOnline](#)

- Wikis
  - [WikiProteins](#)
  - [Differential Geometry](#)
- Virtual Worlds
  - [Second Nature](#)
  - [International Spaceflight Museum](#)
- Collaboration Markets
  - [Innocentive](#)
- Licensing
  - [Science Commons](#)
- Microblogging
  - Friendfeed ([YorkU](#))
  - Twitter ([Yale](#))

# Case Study: FriendFeed

- Lifestream aggregator
  - blog posts
  - Twitter & microblogging
  - Del.icio.us & other book marks
  - Amazon, YouTube and other favourites
- Most amazing as a comment & conversation aggregator and instigator



Search

## Home

- ▶ Favorites
  - ▶ Personal
  - ▶ Professional
- new list

## Me

## Rooms

- Crime and mystery...  
14 minutes ago
  - Data Mining  
23 minutes ago
  - ScienceOnline09  
26 minutes ago
- prefs | 22 more »

## Everyone

Post:  Message  Link  Photos |  Import siteView: **Standard** - Real-time - Best of day **Låura Harris**

"Yesterday, I wanted to search MeLCat, a consortial catalog. I knew there was a link on the "no results" page of OUR catalog, so I purposely typed a random string of characters in as a search query. Got the link to MeLCat, which then searched for that random string. It actually brought something up.."

🔒 1 hour ago - Comment - Like - Hide - More ▾

😊 Sir Shuping liked this

💬 (For reference, the string was something like hjk.) I e-mailed the library and suggested that perhaps they didn't mean that hjkkkkkkkkk was an alternate title for the Muppet Sing-Along DVD. - Låura Harris

*4 more comments*

💬 DJF, you are in a maze of twisty little databases, all alike. - Phoney Steve

💬 Steve: the best part is that one actually finds things if that string is used in the right place. - DJF via twirl

 **Bora Zivkovic** - A Blog Around The Clock

[On a crusade to save us from bad statistical errors](#)

44 minutes ago - scienceblogs.com - Comment - Like - Hide - More ▾

😊 Ladybug Heather liked this

 **Vince DeGeorge** (**Hutch Carpenter** liked this)

"Twitter is failing me BIG TIME today. Trying to set up something for work for weather alerts and continue to get the fail whale. FAIL. FAIL. FAIL."

10 minutes ago - Comment - Like - Hide - More ▾

😊 Hutch Carpenter and AJ Batac liked this

 **Dion Hinchcliffe** (**Hutch Carpenter** liked this) - Twitter

## Home

- ▶ Favorites
  - ▶ Personal
  - ▶ Professional
- new list

## Me

## Rooms

- Crime and mystery...  
18 seconds ago
  - Data Mining  
33 minutes ago
  - ScienceOnline09  
35 minutes ago
- prefs | 22 more »

## Everyone



## Meg version M.0

Block Subscribe

Feed

Comments + Likes

Meg + Friends

Meg's subscriptions

« Back to Meg's feed

"Learning activities for basic research classes. What are yours? We mostly do lecture/demonstration and questions from students. That bores me."

October 27 at 11:09 am - Comment - Like - More ▾

Stephanie\_IsSoVeryHopeful, jokrausdu, Stephen Francoeur and 3 other people liked this

- Meg, what about brief demo, then break students into groups, have them explore, look for something and report back out - what they liked, didn't like - each group could use a diff database/library catalog/free internet? - ʌʌĈ
- If subject based, I'll pull a few dozen subject encyclopedias into the room and have them find/read article on their topic, pulling out keywords/search vocab and also use the "for further research" bibliography. Ideally, a cold search before, and an informed search after, but I never get all that... (did that make sense?) - RudīBЯaЯian
- I have them do a search exercise to show them how AND works. I change the search topic all the time depending on the class and what's in the news. Example here: <http://docs.google.com/Doc?id=...> - Stephen Francoeur
- I also give them 3 citations and ask them to identify what kind of source is being cited (and how they know that to be true). One citation is for a book, another for a scholarly journal article, a third for a magazine article. I don't teach them anything about citations prior to this exercise; they learn as they go (or as they guess, I suppose). - Stephen Francoeur
- I usually do topic development with them. Ask for a volunter from the class willing to talk about his/her research topic. Then I ask the student questions to help narrow the topic down, reveal different facets (subjects) of it, identify any words related to the topic, and list potential info producers on that topic (e.g., psychologists, legal scholars, economists, etc.) I can share the handout for that if anyone is interested. - Stephen Francoeur
- I would \*love\* a handout, Stephen. Thanks everyone for your suggestions! I'm excited to get beyond the talking head. - Meg version M.0

## Home

- ▶ Favorites
  - ▶ Personal
  - ▶ Professional
- new list

## Me

## Rooms

Crime and mystery...  
3 minutes ago

Data Mining  
36 minutes ago

ScienceOnline09  
38 minutes ago

prefs | 22 more »

## Everyone



## Cameron Neylon

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[Comments + Likes](#)

[Cameron + Friends](#)

[Cameron's subscriptions](#)

« [Back to Cameron's feed](#)

"Request for assistance:"

April 11 at 5:53 am - [Comment](#) - [Like](#) - [More](#) ▾

Hutch Carpenter liked this

I'm trying to build a model of the calcium gated potassium channel MthK using the PDB files 1lnq and 2fy8. MthK has a gating domain (rck domain) and a transmembrane domain and works as a tetramer of full length proteins with a tetramer of just rck domain. So I can build the ligand bound (open conformation) from 1lnq by removing residues 19-98 from chains A, B, C, and D. The closed conformation is harder. 2fy8 has the rck domain in the closed conformation but the deposited structure is the asymmetric unit and not the biological unit. What I need to do is build the rck octamer in the closed conformation and then to put that back on top of the transmembrane domain tetramer. Swiss pdb viewer which isn't really cutting the mustard. If anyone can help us by building the models that would be brilliant. Our aim is to determine the structure of these molecules in solution (with detergent) by small angle scattering so good models to compare with data are crucial. Authorship on papers a given - can't offer any money - Cameron Neylon

How fast that needs to be done? I think I can help, but I can start in the middle of the next week. - Pawel Szczesny

Different things for different times. We're putting in the beamtime application next week (Wed) so having a model that we can use to predict scattering would be useful (but not critical) for that. Beamtime won't be until second half of the year at earliest and data analysis will be later again. So if it were possible to get something rough next week that would be brilliant but beyond that its a moderately long term thing. - Cameron Neylon

I cannot promise it's going to be ready for Wed, but if it's only a rough model/picture at least I will try. - Pawel Szczesny


The resolution of SAS is quite low so for prediction something that's just got the shape right is fine. Details of interactions are not so important. The detail can be pinned down later when we have high quality data to compare to.

# Case Study: ScienceBlogs

- Community of 70+ bloggers
- All science disciplines are represented
- Vibrant and interesting, lots of comments
- A bit cliquish, but not too much
- About more than just science, politics and culture too

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[A Few Things Ill Considered](#)
[A Good Poop](#)
[A Vote For Science](#)
**THE LATEST POSTS**
[Politico.com's massive and multiple ethical fail.](#) • The Questionable Authority • 1 hour ago


**last 24 hours**

THE MOST RECENT POSTS IN CHRONOLOGICAL ORDER

**JANUARY 28, 2009**
**The Questionable Authority**
[Archives](#) • [About](#) • [RSS](#)

- ➔ [No, Children, "They're Doing It, Too," Is Not An Excuse.](#) I might have mentioned this before, but it's worth mentioning again: if you want to know what got me actively working on a political campaign last year, it was the cumulative "final straw" effect of some Congressional Republicans who...

**Terra Sigillata**
[Archives](#) • [About](#) • [RSS](#)

- ➔ [Lesson 1: Homeopathy is NOT herbal medicine \(repost\)](#) This article yesterday in the Wall Street Journal has led me to revisit and repost an old essay I had at the old place on 6 January 2006. The article addresses Oscillocoquinum, an extract of the liver and heart of...

**The Intersection**
[Archives](#) • [About](#) • [RSS](#)

- ➔ [On The Road](#) By the time this post publishes, I'll be on the open road somewhere between the Atlantic and Pacific. I'm leaving NC a couple months to circle the states for meetings, talks, and some fun along the way. Stopping soon at...

**Pure Pedantry**
[Archives](#) • [About](#) • [RSS](#)

- ➔ [Dennis Overbye on Science and Democracy](#) Dennis Overbye at the NYTimes somewhat unintentionally answers the "what is science's rightful place?" question in his column. He emphasizes the delicate and complex relationship between science and...

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5. [Not Exactly Rocket Science : They don't all look...](#)

# Case Study: Nature Network

- Facebook for scientists
- Encompasses several modules
  - blogs
  - forums
  - groups
  - job sites
  - hubs: London, Boston, New York

## Connect



Keep in touch with colleagues. Make new contacts.

## Discuss



Talk about research and scientific issues.

## Explore



Read the [blogs](#). Browse the [forums](#) and [profiles](#).

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## Get Started



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[A new local hub on Nature Network: New York!](#)

### Most commented blog posts



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[Richard Grant](#) 21 Jan 2009  
[54 comments](#)



#### [Reflections on ScienceOnline09](#)

[Bob O'Hara](#) 19 Jan 2009  
[53 comments](#)



#### [In which I prepare for a bout of lepidoptery](#)

[Jennifer Rohn](#) 18 Jan 2009  
[52 comments](#)

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(86 members)

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posted topic  
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posted comment  
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# Case Study: Useful Chemistry

- Jean-Claude Bradley's Open Lab Notebook
- Uses a wiki as a platform, fully indexed and searchable by Google
- Details of all his lab's experiments
- Another well known advocate is Cameron Neylon





## Actions

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- [To Do List](#)
- [Ugi Chemicals](#)
- [Ugi NMR Analysis](#)
- [Tim's Paper](#)
- 

## List of all experiments

- [Exp213](#) Solubility of 4-chlorobenzaldehyde in chloroform and methanol by UV spectroscopy - **Khalid**
- [EXP212](#) Solubility measurements of p-nitrobenzaldehyde in different solvents. **Tim**
- [EXP211](#) Solubility estimation by UV-VIS **Khalid**
- [EXP210](#) Solubility estimation in methanol and ethanol **Khalid**
- [EXP209](#) Determination of the time parameter for chloroform containing solutions in speedvac. **Khalid/Tim**
- [EXP208](#) Solubility measurements of 9 aldehydes in 6 different solvents. **Khalid/Tim**
- [EXP207](#) Solubility measurements of boc-gly, vanillin and other compounds in methanol, ethanol and THF **JCB**
- [Exp206](#) Purification of the [ugi product](#)  - **Khalid**
- [Exp205](#) Solubilities of 10 aldehydes in methanol -**Tim and Khalid**
- [Exp204](#) Determination of solubility of Ugi adduct ([99C](#)) in Methanol, Ethanol, Acetonitrile, Tetrahydrofuran, Acetone, Hexane, Chloroform, and Distilled Water - **Cedric and Aneta**
- [Exp203](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide - **Khalid**
- [Exp202](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide - **Khalid**
- [Exp201](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide - **Khalid**
- [Exp200](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide (verified by TomO) - **Khalid**
- [Exp199](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide (verified by TomO) - **Khalid**
- [Exp198](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide - **Khalid**
- [Exp197](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl isocyanide - **Khalid**
- [Exp196](#) Optimization of a Ugi reaction involving Benzaldehyde, Furfurylamine, Boc-Glycine and *tert*-butyl

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Offgassing, Product Testing Fast Results [www.EMSL.com](http://www.EMSL.com)

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# Case Study: Postgenomic & Nature Blogs

- Nature's blog & news aggregator sites
- Top stories float to the top
- Also Scintilla

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Postgenomic collects posts from hundreds of science blogs and then does useful and interesting things with that data.

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Keep up to date with hot papers. Find new science blogs. Track stories as they break.

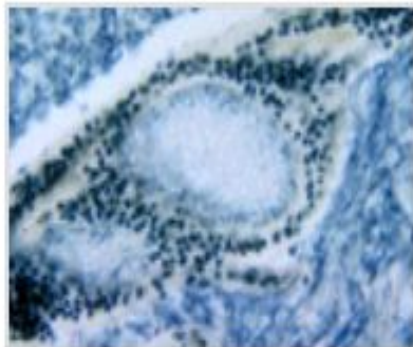
### For Bloggers

Reach a bigger audience. Enable trackbacks, most popular post widgets and more. Post reviews, research and conference reports.

### For Publishers

See which books and papers bloggers are talking about. Find experts.

## Hot stories



### First Human Embryonic Stem Cell Study Approved

Slashdot: Science

dogmatixpsych writes "The FDA recently approved a privately funded study where human embryonic stem cells will be transplanted into subjects with complete spinal cord injuries. All trials will be paid for and conducted by researchers working for

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ScienceOnline'09 - WiSE Lacks Shanties



Friday Hope Blogging



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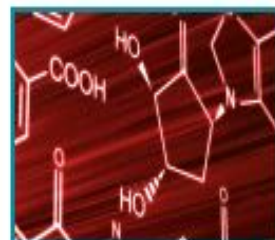
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## Blogs on nature.com

- [By NPG Staff](#)
- [On Nature Network](#)



### BY NPG STAFF



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The chemistry blog from the nature.com journals.



#### [The Great Beyond](#)

Our up-to-the minute digest of what is being reported elsewhere.



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[Part 3 of Welcome to MY Brain:](#)

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- Journal of Visualized Experiments
- Video of experiments so other can see exactly what's going on

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01/26/2009

## Visually Mediated Odor Tracking During Flight in Drosophila

**Mark A. Frye, Brian J. Duistermars**

Department of Physiological Science, University of California, Los Angeles



Here we describe how to optimize the acquired video image for an olfactory magnetic-tether (OMT) apparatus. We also describe two sample experimental protocols for studying visuo-olfactory fusion.

[View Protocol >>](#)

01/23/2009

## Embryonic Stem Cell-Derived Endothelial Cells for Treatment of Hindlimb Ischemia

**Hgan F. Huang<sup>1</sup>, Hiroshi Iiiyama<sup>1</sup>, Abhijit De<sup>2</sup>, Sanjiv S. Gambhir<sup>2</sup>, John P. Cooke<sup>1</sup>**
<sup>1</sup>Division of Cardiovascular Medicine, Stanford University, <sup>2</sup>Department of Radiology, Stanford University


The surgical procedure for delivery of embryonic stem cell-derived endothelial cells to the ischemic hindlimb is demonstrated, with non-invasive tracking by

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09/03/2008

**Protocols for Oral Infection of Lepidopteran Larvae with Baculovirus**


10/13/2008

**Blood Collection from the American Horseshoe Crab**
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# Case Study: PLoS One

- Open Access journal
- All articles that represent valid science are published, no filtering for "importance"
- Commenting is encouraged
- There's a community organizer

RESEARCH ARTICLE



# Can Playing the Computer Game “Tetris” Reduce the Build-Up of Flashbacks for Trauma? A Proposal from Cognitive Science

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Emily A. Holmes<sup>\*</sup>, Ella L. James, Thomas Coode-Bate, Catherine Deeptose

Department of Psychiatry, University of Oxford, Oxford, United Kingdom

## Abstract

### Background

Flashbacks are the hallmark symptom of Posttraumatic Stress Disorder (PTSD). Although we have successful treatments for full-blown PTSD, early interventions are lacking. We propose the utility of developing a ‘cognitive vaccine’ to prevent PTSD flashback development following exposure to trauma. Our theory is based on two key findings: 1) Cognitive science suggests that the brain has selective resources with limited capacity; 2) The neurobiology of memory suggests a 6-hr window to disrupt

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# Case Study: MST Visions

- Outreach blog for the Missouri University of Science and Technology | Rolla
- Tells great stories about what their researchers are doing
- More than just press releases

## Tune in tonight for TV with a bang

By Andrew Careaga on January 28, 2009 9:31 AM | [Permalink](#) | [Comments \(0\)](#) | [TrackBacks \(0\)](#)

Must-see TV: tonight's premiere episode of [The Detonators](#), a new Discovery Channel series featuring our resident explosives expert and one of his former students. The program begins at 7 p.m. Rolla Standard Time (otherwise known as Central Standard Time) today (Wednesday, Jan. 28) and will air every Wednesday at the same time.

So, record *American Idol* if you must, but don't miss this debut of Paul Worsley and Braden Lusk as they burst onto the television scene.

If you can't wait until the show's premiere, here's a little promo to whet your appetite:

[Watch The Detonators blow up a car](#) at the S&T Experimental Mine.



## N is for Nowledge, F is for Fisicks

By Lance Feyh on January 23, 2009 9:26 AM | [Permalink](#) | [Comments \(1\)](#) | [TrackBacks \(0\)](#)

Dr. Tim Gay is known as the guy responsible for the largest physics classes ever taught. Those classes, which were very short, were held at Memorial Stadium in Lincoln, Neb. A former faculty member at Missouri S&T, Gay is now with the University of Nebraska, where football is Everything and where the N on the helmets stands for Nowledge.

Gay wanted to give some of those knowledgeable, rabid football fans an introduction to physics -- so he made a series of really short, very fun videos that were distributed on the jumbo screen during Nebraska home games. In this way, he

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- [TechnoFiles: September 2008](#)
- [TechnoFiles: August 2008](#)
- [TechnoFiles: May 2008 \(Formula SAE Team\)](#)
- [TechnoFiles: April 2008 \(Improving armor\)](#)

## Experience This @



# Issues in the community

- Open vs. closed
  - data
  - lab notebooks
  - journals
- Bloggers vs. journalists
- Open Peer Review
- Impact factors / incentives / reward system
- Why is adoption of new tools so slow

# What do scientists want

- Solve actual problem better than existing tools
- Simplify current f2f social & collaborative networks
- One stop shopping for recording, processing, analyzing and document preparation
- Data curation
- Integration, integration, integration
- Imagine: Google Scholar, OA literature, Google Docs, Nature Network, Connotea, electronic Lab Notebooks and Matlab

# What can we give them

He's like SuperLibrarian. Everyone forgets, Willow, that knowledge is the ultimate weapon.

-Xander about Giles (Buffy the Vampire Slayer)

# A very provisional list

- Twitter & IM reference
- FriendFeed rooms
- Better information filtering systems
- Build useful, targeted IRs that play well with others
- Integrating/leading the way into social networks such as FriendFeed or Nature Networks
- Hosting wiki, blog or lab notebook software
- Use blogs to help them promote their work
- Raising awareness of other 2.0 tools

# The challenge

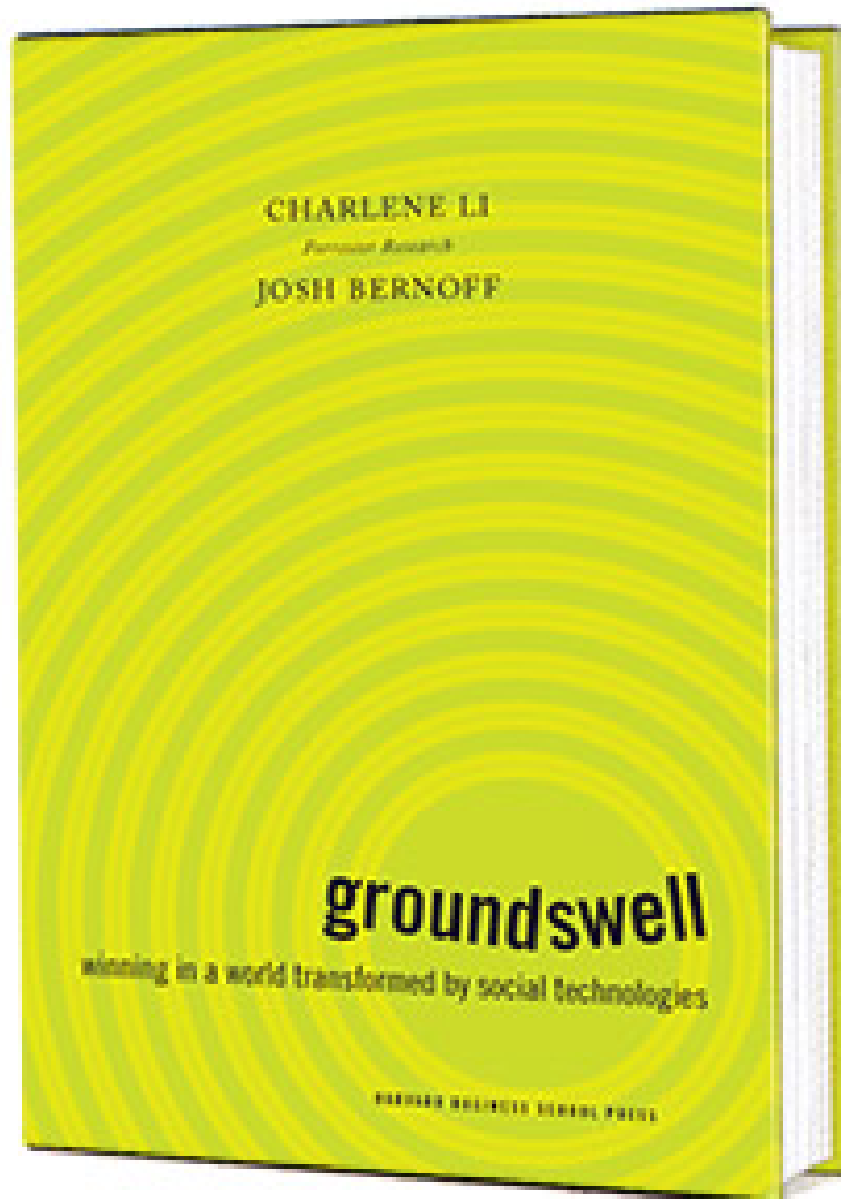
- Convincing forward thinking members of our communities that librarians are their natural allies
  - Those already engaged in Science 2.0 activities
  - Those that could be easily persuaded to engage



But there's a disconnect



# Where to go from here



# Tapping the Groundswell

- Listen to your community
- Respond to their feedback
- Empower them to contribute
- Connect them to each other
- Embrace their innovation

# Letting the Groundswell transform you

- It's about person-to-person
- Be focused on your community
- Be patient
- Be opportunistic
- Be flexible
- Be collaborative
- Be humble

# Five guidelines

1. The tool must solve a problem
2. It must outperform existing tools
3. It must be nearly 100% reliable
4. There must be at least one killer feature
5. You must prepopulate

-Cameron Neylon & Deepak Singh

Some more thoughts

The barriers to full-scale adoption are not only (or even mainly) technical, but rather social and psychological.

-[Timo Hannay](#)

The long-term trends are already unmistakable... productivity measures that look beyond journal publication records, a blurring of the boundaries between journals and databases, reinventions of the roles of publishers and editors...

-[Timo Hannay](#)



In scientific publishing, we are beginning to see books and electronic journals becoming more integrated with databases, blogs, and other digital media on the Web. **These and other changes could lead to a resurgence in the role of nonprofit professional societies and institutional libraries** in the scientific enterprise as the cost of publishing falls.

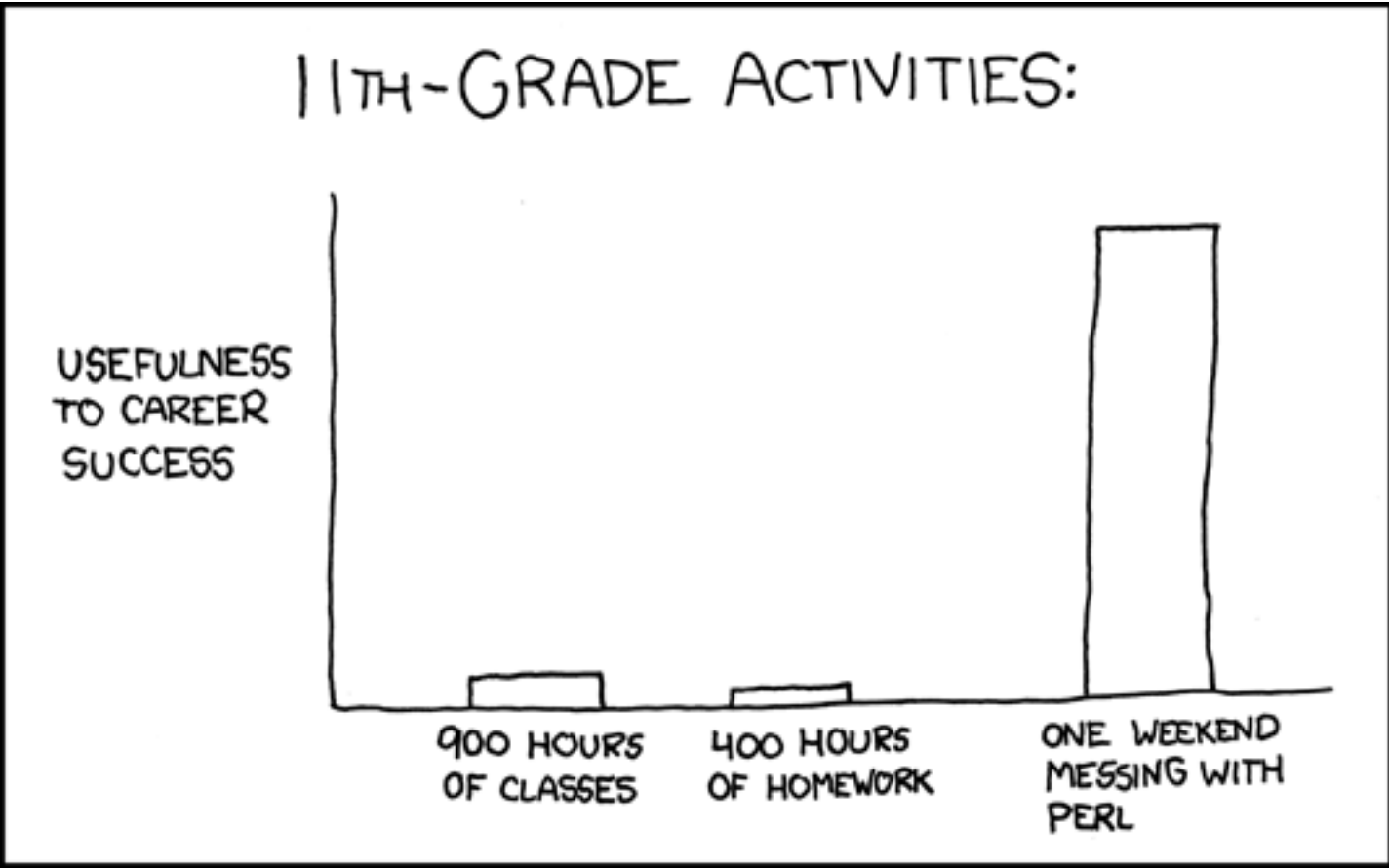
[-Duncan Hull et al.](#)

What is certain is the fact that we can look forward to a digital library that is more integrated, sociable, personalized, and accessible, although it may never be completely “frost-free”. **Ultimately, better libraries will be a massive benefit to science.**

-[Duncan Hull et al.](#)

[T]he real challenge is first, creating something that's useful, fun and compelling. The second challenge is to interest people in joining and contributing. The two challenges are related, of course. The degree to which these kinds of initiatives are useful, fun and compelling is directly related to who's involved and how much they contribute.

[-John Dupuis](#)



# How to learn more

- Engage in your patrons' online communities
  - FriendFeed, Nature Network, Twitter
- Go to some conferences
  - Meet your users & patrons
- Read a lot of blogs
  - Mostly by your target audience
- Read a lot of books & articles
  - Mostly about social media & trends

[W]e are going to change the way scientists share information; we are going to change the way expert attention itself is allocated, developing new methods for connecting people, for organizing people, for leveraging people's skills. They will be redirected, organized, and amplified. The result will speed up the rate at which discoveries are made, not in one small corner of science, but across all of science.

-[Michael Nielsen](#)

# Contact & References

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<http://jdupuis.blogspot.com>

<http://friendfeed.com/johndupuis>

<http://twitter.com/dupuisj>

This presentation: <http://tinyurl.com/dupuisola2009>

## References

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