We will begin momentarily at 2pm ET

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Grant Accounting Manager
Department of Chemistry
Virginia Commonwealth University

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Science Has a Problem

THE SCIENCE NEWS CYCLE

Start Here

Your Research

Correlation: A is correlated with B (p=0.01)

Your Community

S and media conditions.

Eventually making it...

is translated by...

UNIVERSITY PR
OFFICE

FOR IMMEDIATE RELEASE
SCIENTISTS FIND INTERESTING LINK BETWEEN A AND B

which is then picked up by...

LOCAL EVENTLESS
NEWS

and coverage...

Cable NEWS

and noticed by...

The Interests

who are read by...

Scientists cut to kill us again

WWW.PHDCOMICS.COM

Comic Credit: http://www.phdcomics.com/comics.php?c=1174
Science Has a Problem

Scientists’ Perspective: Limited Public Knowledge About Science Is a Major Problem

% of AAAS scientists saying... is a major or minor problem for science in general.

Public doesn’t know much about science

<table>
<thead>
<tr>
<th>Major problem</th>
<th>Minor problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>14</td>
</tr>
</tbody>
</table>

AAAS scientists survey Sept 11-Oct 13, 2014. Q5d. Those saying this is not a problem or giving no answer are not shown.

Pew Research Center

Science Has a Problem

Mixed Perceptions of Scientific Consensus About ‘Big Bang,’ Climate Change and Evolution

% of U.S. adults saying that scientists generally believe/are divided that the universe was created in a single, violent event often called “the Big Bang”

The Big Bang

- Scientists are divided
- Scientists generally believe

U.S. adults

| U.S. adults | 82 | 42 |

% of U.S. adults saying that scientists generally agree/do not agree that the earth is getting warmer due to human activity

Climate Change

- Scientists do not agree
- Scientists generally agree

U.S. adults

| U.S. adults | 37 | 57 |

% of U.S. adults saying that scientists generally agree/do not agree that humans have evolved over time

Evolution

- Scientists do not agree
- Scientists generally agree

U.S. adults

| U.S. adults | 29 | 69 |


Pew Research Center
How Did Things Get This Way?
Part is the Nature of Journalism...

Newspaper Advertising Revenue: Adjusted for Inflation, 1950 to 2013

- Billions of 2003 Dollars
- Source: Newspaper Association of America, Charge Biens Blog

How Did Things Get This Way?
Part is the Nature of Journalism...

Readership Falls for Most Age Groups
Percentage Nationwide Who Read Any Daily Newspaper Yesterday

Source: Scarborough Research survey data
Note: 1999 - 2012 Scarborough Report, Release 1
PEW RESEARCH CENTER
2013 STATE OF THE NEWS MEDIA
Audience Survey Question

Do you talk about science online?

• No, not really
• I occasionally post things to my personal accounts
• I frequently, write or post about science
• It’s part of my job

...But a Larger Part is the Culture of Science

• Scientific fields are dominated by introverted personalities
• Substantial language barriers due to jargon and technical terms
• Economic value creates incentives to keep knowledge secret
• “The Science will speak for itself.”
Scientists and Society

People distrust what they see as different.

What is to be Done?

- Cultural change is difficult, there is no magic pill
- Popular cultural representations (Normalization, How many of us are compared to characters in the “Big Bang Theory”?)
- Open discussions between scientists and the general public to remove sensationalism (Disintermediation)
- Communication as a core goal, not an add on.
Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT

Just how big is reddit...what is the approximate number of pages viewed in one month?

• Over 1 million page views
• Over 7 million page views
• Over 1 billion page views
• Over 7 billion page views
Just How Big is Reddit?

<table>
<thead>
<tr>
<th>stats at a glance</th>
<th>as of May 26, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>last month, reddit had</td>
<td>169,026,326</td>
</tr>
<tr>
<td>unique visitors</td>
<td>209</td>
</tr>
<tr>
<td>hailing from</td>
<td>different countries</td>
</tr>
<tr>
<td>yesterday, reddit powered</td>
<td>9,408</td>
</tr>
<tr>
<td>active communities</td>
<td>7,553,570,911</td>
</tr>
<tr>
<td>consisting of over</td>
<td>pages</td>
</tr>
<tr>
<td>logged in redditors</td>
<td>3,523,190</td>
</tr>
<tr>
<td>casting over</td>
<td>26,062,664</td>
</tr>
<tr>
<td>votes</td>
<td></td>
</tr>
</tbody>
</table>

Reddit User Demographics

Alexa Traffic Ranks
How is this site ranked relative to other sites?

Global Rank
36

Rank in United States
9
Reddit User Demographics

Audience Demographics
How similar is this site's audience to the general internet population?

<table>
<thead>
<tr>
<th>Gender</th>
<th>Internet Average</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>No College</td>
<td>Below</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>Below</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td>Graduate School</td>
<td>Below</td>
<td>Above</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>Below</td>
<td>Above</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Internet Average</th>
<th>Home</th>
<th>School</th>
<th>Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>No College</td>
<td>Below</td>
<td>Above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some College</td>
<td>Below</td>
<td>Above</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Below</td>
<td>Above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>Below</td>
<td>Above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Browsing Location</th>
<th>Internet Average</th>
<th>Home</th>
<th>School</th>
<th>Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>No College</td>
<td>Below</td>
<td>Above</td>
<td></td>
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<td>Above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>Below</td>
<td>Above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reddit User Demographics

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent of Visitors</th>
<th>Rank in Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>63.7%</td>
<td>9</td>
</tr>
<tr>
<td>India</td>
<td>7.9%</td>
<td>44</td>
</tr>
<tr>
<td>Canada</td>
<td>3.7%</td>
<td>13</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>3.2%</td>
<td>29</td>
</tr>
<tr>
<td>Australia</td>
<td>1.8%</td>
<td>21</td>
</tr>
</tbody>
</table>
Reddit User Demographics

1. Google.com
   Enables users to

2. Facebook.com
   A social utility that

3. Amazon.com
   Amazon.com see

4. Youtube.com
   YouTube is a way

5. Yahoo.com
   A major internet:

6. Wikipedia.org
   A free encyclopedia

7. Ebay.com
   International pen:

8. Twitter.com
   Social networking

9. Reddit.com
   User-generated r

10. Linkedin.com
    A networking too

Reddit Usage by Age

Young males are especially likely to use Reddit
% of internet users in each age/gender grouping who use Reddit

Source: Pew Research Center’s Internet & American Life Project Spring Tracking Survey, April 17 – May 19, 2013. N=2,252 adults ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on all internet users is +/- 2.5 percentage points.
How is Reddit Organized?

- Reddit is sub-divided into user-created subsections referred to as “subreddits”
- Subreddits are often referred to by their shortened url, i.e. `www.reddit.com/r/science` is `/r/science`
- Typical subreddits focus on a particular interest or group
- For example:

<table>
<thead>
<tr>
<th>Category</th>
<th>Subreddits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational</td>
<td>News, Science, Space, TodayLearned (TIL), and WorldNews</td>
</tr>
<tr>
<td>Entertainment</td>
<td>Creepy, Documentaries, Gaming, ListenToThis, Movies, Music, NoSleep, Sports, Television, and Videos</td>
</tr>
<tr>
<td>Discussion-based</td>
<td>AskReddit, AskScience, Books, ExplainLikeImm5e, IAmA, and TwoXChromosomes</td>
</tr>
<tr>
<td>Humor/light-hearted</td>
<td>DatasIsBeautiful, Funny, InternetIsBeautiful, Jokes, NotTheOnion, ShowerThoughts, StandUpShots, TiFU, and UpliftingNews</td>
</tr>
<tr>
<td>Image sharing</td>
<td>Art, Aww, EarthPorn, Gifs, MiddlyInteresting, OldSchoolCool, Pics, and PhotoshopBattles</td>
</tr>
<tr>
<td>Self-improvement</td>
<td>DIY, Fitness, Food, GetMotivated, LifeProTips, PersonalFinance, Philosophy, and WritingPrompts</td>
</tr>
<tr>
<td>Technology</td>
<td>Futurology and Gadgets</td>
</tr>
<tr>
<td>Meta</td>
<td>Announcements and Blog</td>
</tr>
</tbody>
</table>

How many subreddits are there as of May 19, 2015?

- Over 100,000 subreddits
- Over 300,000 subreddits
- Over 500,000 subreddits
- Over 600,000 subreddits
- Over 1,000,000 subreddits
How Many Subreddits are There?

• An almost unbelievable number!

• As of May 19th, 2015 there are 647,363 subreddits

How Big is /r/science?

8,370,263 readers (1,552 here)
Compare to the Populations of Major Cities

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>State</th>
<th>2013 Estimate</th>
<th>2010 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New York</td>
<td>New York</td>
<td>8,405,837</td>
<td>8,175,133</td>
</tr>
<tr>
<td>2</td>
<td>Los Angeles</td>
<td>California</td>
<td>3,884,307</td>
<td>3,792,621</td>
</tr>
<tr>
<td>3</td>
<td>Chicago</td>
<td>Illinois</td>
<td>2,716,782</td>
<td>2,695,598</td>
</tr>
<tr>
<td>4</td>
<td>Houston</td>
<td>Texas</td>
<td>2,195,914</td>
<td>2,100,263</td>
</tr>
<tr>
<td>5</td>
<td>Philadelphia</td>
<td>Pennsylvania</td>
<td>1,553,165</td>
<td>1,526,006</td>
</tr>
<tr>
<td>6</td>
<td>Phoenix</td>
<td>Arizona</td>
<td>1,513,367</td>
<td>1,445,632</td>
</tr>
<tr>
<td>7</td>
<td>San Antonio</td>
<td>Texas</td>
<td>1,409,019</td>
<td>1,327,407</td>
</tr>
<tr>
<td>8</td>
<td>San Diego</td>
<td>California</td>
<td>1,355,896</td>
<td>1,207,402</td>
</tr>
<tr>
<td>9</td>
<td>Dallas</td>
<td>Texas</td>
<td>1,257,676</td>
<td>1,197,816</td>
</tr>
<tr>
<td>10</td>
<td>San Jose</td>
<td>California</td>
<td>998,537</td>
<td>945,942</td>
</tr>
</tbody>
</table>

What are our Goals?

- **Normalize:** Person to Person interactions with scientists
- **Illuminate:** Realistic descriptions of the process of science, rather than strictly the results.
- **Disintermediation:** Skip the sensationalism and sound bites
What is our Approach?

- Verified Users
- The Science AMA Series
- Science Discussions

Verified Users

- Reduces the “internet degree” claims
- Provide context for scientific facts
- Explain methodology and statistics, and importance of results
- Enable general users to better gauge competence of comments

"On the Internet, nobody knows you're a dog."
• Reddit initialism for “Ask Me Anything”

• It is essentially a crowd-sourced interview.

• Someone of interest submits a text post describing why they are of interest and announces “AMA!”

• Users then submit comments to the post asking their questions, which the original poster answers as many as he can (or wants to, these things can get pretty big!)

• /r/IAMA is dedicated entirely to AMAs

What an AMA Looks Like
Comments and Questions

Barriers to Successful Science AMAs

• /r/IAMA does host science-based AMAs, however, it hosts a large number of AMAs.

• This is difficult for scientists to compete for attention against actors promoting movies, musicians, TV personalities, authors, and others.

• /r/IAMA does not heavily moderate comments, so many inappropriate questions get through, making for a potentially unpleasant experience for someone new to the nature of the internet.

• Individuals wishing to post an AMA are own their own to learn the rules and standard of reddit, which can be difficult for outsiders.
How Does /r/science Address these Issues?

• /r/science organizes, promotes and polices the AMAs we host to remove these barriers.

• We handle all of the reddit-specific actions. (account creation, posting, internal-promotion)

• We provide for a civil discussion by rigorous enforcement of decorum.

• More than 820 moderators all with a minimum of a BS degree in a science, (300+ are PhDs)

• “Hard questions are ok, uncivil behavior is not.”

• We work with scientists via email, and sometimes phone calls to address concerns and refine text.

• We host one AMA per day maximum, and only scientists.

AMA Examples

• All /r/science AMAs are viewable at this link: http://www.reddit.com/r/science/search?q=flair%3A%27AMA%27&sort=new&restrict_sr=on
Partner Science Organizations

- American Chemical Society Webinars (More to be announced soon!)
- PLOS Science Wednesday: Collaboration with the PLOS Journals to bring PLOS Authors directly to /r/science
- National Oceanic and Atmospheric Administration
- California Academy of Science
- Public Voices Fellowship
- Columbia University
- Many others

Science AMA Submission Guide

- Our grand goal is to make Science AMAs on reddit a culturally expected step for scientists.
  - Publish an important paper
  - Communicate it directly to the public (“I’m going to do an AMA!”)

- We have a step-by-step guide for scheduling and submitting AMAs: Reddit Science AMA Submission Guide
  https://drive.google.com/file/d/0B3fzgHAW-mVZM0NndWNNZHNFQjA/edit

- Any further questions can be emailed to scientereddit@gmail.com
Science Discussion

• Facts are Plentiful
  • Wikipedia
  • PubMed
  • Google Scholar

• Context is not
  • Context is learned
  • Context takes working in a field

• Science Discussions are aimed at providing greater context to our readers, and allowing our verified scientists the ability to expose the reddit users to their understanding of an issue.

Many Thanks

• The 3000+ verified users of /r/science who lend their expertise to the public

• The 820+ moderators of /r/science who allow us to reach further and be better than we could imagine

• The millions of readers of /r/science who make an effort to read and understand science, even though it’s complicated and massive.

• Our AMA guests, who take time out of their busy schedules to answer questions from anonymous users on the internet.

• The ACS Webinars Team for allowing me a platform to tell you all about this project.
Questions in just a moment...

"Science Communication in the Digital Media Age"

Nathan Allen
Moderator of r/science, Reddit
and Research Chemist, ANGUS Chemicals

Chris McCarthy
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Joann Williams
Grant Accounting Manager
Department of Chemistry
Virginia Commonwealth University

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